

# STRATEGIC FLOOD RISK ASSESSMENT

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FOR THE

## DUNDALK LOCAL AREA PLAN 2025-2031

for: **Louth County Council**



Comhairle Contae Lú  
**Louth** County Council

by: **CAAS Ltd.**



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# Table of Contents

<b>Section 1</b>	<b>Introduction and Policy Background.....</b>	<b>1</b>
1.1	Introduction .....	1
1.2	The Local Area Plan .....	1
1.3	Flood Risk and its Relevance as an Issue to the Plan.....	1
1.4	Flood Risk Management Policy .....	2
1.5	Emerging Information and Disclaimer .....	5
<b>Section 2</b>	<b>Stage 1 SFRA - Flood Risk Identification .....</b>	<b>6</b>
2.1	Introduction .....	6
2.2	Drainage, Defences and Early Warning Systems .....	6
2.3	Other Flood Studies .....	7
2.4	Flood Risk Indicators.....	8
2.5	Conclusion .....	10
<b>Section 3</b>	<b>Stage 2 SFRA - Flood Risk Assessment .....</b>	<b>11</b>
3.1	Introduction .....	11
3.2	Findings and Adequacy of Existing Information and Delineation of Flood Zones.....	11
3.3	Flood Risk Zone Mapping.....	11
3.4	Sensitivity to Climate Change.....	12
3.5	Sustainable Drainage Systems and Surface Water Guidance and Strategy.....	13
<b>Section 4</b>	<b>Flood and Drainage Provisions.....</b>	<b>16</b>
4.1	Introduction .....	16
4.2	Land Use Zoning.....	16
4.3	Integration of flood risk management provisions into the Louth County Development Plan....	16
4.4	Integration of flood risk management provisions into the Local Area Plan .....	17
4.5	Justification Tests .....	20
<b>Section 5</b>	<b>Conclusion .....</b>	<b>27</b>

## Appendix I

Summary of the requirements of the Flood Guidelines for land uses in Flood Zones

## Appendix II

Selection of Flood Risk Indicator Mapping and Flood Zone Mapping

# Section 1 Introduction and Policy Background

## 1.1 Introduction

Louth County Council has prepared a Local Area Plan (LAP) for Dundalk under the Planning and Development Act 2000 (as amended). The Plan sets out an overall strategy for the proper planning and sustainable development of the town over the years 2025-2031.

This Strategic Flood Risk Assessment (SFRA) document has been prepared alongside the LAP taking into account *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* (Department of the Environment, Heritage and Local Government and Office of Public Works, 2009) and Department of the Environment, Community and Local Government Circular PL 2/2014.

## 1.2 The Local Area Plan

LAPs are required to be consistent with the policy objectives of the County Development Plan and its Core Strategy, as well as the National Planning Framework and Regional Spatial Economic Strategies.

The LAP should be read in conjunction with the Louth County Development Plan 2021-2027 (as varied), which sets out the overarching development strategy for the County. Where conflicting policy objectives arise between the County Development Plan and the LAP, the policy objectives of the relevant County Development Plan shall take precedence.

The general development management standards, zoning matrix/descriptions and policies and objectives in the County Development Plan (including provisions relating to flood risk management and drainage) can be applied to the Plan area, while additional policy objectives that are specific to Dundalk are included in the LAP.

In addition, land use zoning contained within the Plan has been informed by the SFRA process and associated delineation of flood risk zones. The detailed Plan preparation process undertaken by the Planning Department combined with specialist input from the SFRA process facilitated zoning that helps to avoid inappropriate development being permitted in areas of high flood risk.

## 1.3 Flood Risk and its Relevance as an Issue to the Plan

Flooding is an environmental phenomenon and can pose a risk to human health as well as causing economic and social effects. Some of the effects of flooding are identified on Table 1.

Certain lands within the Plan area have the potential to be vulnerable to flooding and this vulnerability could be exacerbated by changes in both the occurrence of severe rainfall events and associated flooding. Local conditions such as low-lying lands and slow surface water drainage can increase the risk of flooding.

**Table 1 Potential effects that may occur as a result of flooding**

Tangible Effects	Intangible Human and Other Effects
Damage to buildings (houses)	Loss of life
Damage to contents of buildings	Physical injury
Damage to new infrastructure e.g. roads	Increased stress
Loss of income	Physical and psychological trauma
Disruption of flow of employees to work causing knock on effects	Increase in flood related suicide
Enhanced rate of property deterioration and decay	Increase in ill health
Long term rot and damp	Homelessness
	Loss of uninsured possessions

## 1.4 Flood Risk Management Policy

### 1.4.1 EU Floods Directive

The European Directive 2007/60/EC on the assessment and management of flood risk aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU. The Directive requires Member States to:

- Carry out a preliminary assessment by 2011 in order to identify the river basins and associated coastal areas where potential significant flood risk exists (preliminary mapping was prepared and a list of Areas for Further Assessment finalised in 2012).
- Prepare flood extent maps for the identified areas (finalised in 2016 for inclusion in Flood Risk Management Plans – see below).
- Prepare flood risk management plans focused on prevention, protection and preparedness. These plans are to include measures to reduce the probability of flooding and its potential consequences. These Plans were adopted in 2018.

Implementation of the EU Floods Directive is required to be coordinated with the requirements of the EU Water Framework Directive and the current National River Basin Management Plan.

### 1.4.2 National Flood Policy

Historically, flood risk management focused on land drainage for the benefit of agricultural improvement. With increasing urbanisation, the Arterial Drainage Act, 1945, was amended in 1995 to permit the Office of Public Works (OPW) to implement localised flood relief schemes to provide flood protection for cities, towns and villages.

In line with changing national and international paradigms on how to manage flood risk most effectively and efficiently, a review of national flood policy was undertaken in 2003-2004. The review was undertaken by an Inter-Departmental Review Group, led by the Minister of State at the Department of Finance with special responsibility for the OPW. The Review Group prepared a report that was put to Government, and subsequently approved and published in September 2004 (Report of the Flood Policy Review Group, OPW, 2004).

The scope of the review included a review of the roles and responsibilities of the different bodies with responsibilities for managing flood risk, and to set a new policy for flood risk management in Ireland into the future. The adopted policy was accompanied by many specific recommendations, including:

- Focus on managing flood risk, rather than relying only flood on protection measures aimed at reducing flooding;
- Taking a catchment-based approach to assess and manage risks within the whole-catchment context; and
- Being proactive in assessing and managing flood risks, including the preparation of flood maps and flood risk management plans.

### 1.4.3 National CFRAM Programme

The national Catchment Flood Risk Assessment and Management (CFRAM) programme commenced in Ireland in 2011. The CFRAM Programme is intended to deliver on core components of the National Flood Policy, adopted in 2004, and on the requirements of the EU Floods Directive. The Programme has been implemented through CFRAM studies that have been undertaken for each of the river basin districts in Ireland.

The CFRAM Programme comprises three phases as follows:

- The Preliminary Flood Risk Assessment<sup>1</sup> (PFRA) mapping exercise, which was completed in 2012;
- The CFRAM Studies and parallel activities, with Flood Risk Management Plans finalised in 2018; and
- Implementation and Review.

The Programme provides for three main consultative stages as follows:

- Consultation for the PFRA mapping that was adopted in 2012;
- Consultation for Flood Extent mapping, that was finalised in 2016 for inclusion in Flood Risk Management Plans; and
- Consultation for Flood Risk Management Plans, that were adopted in 2018.

The OPW is the lead agency for flood risk management in Ireland. The coordination and implementation of Government policy on the management of flood risk in Ireland is part of its responsibility. The European Communities (Assessment and Management of Flood Risks) Regulations 2010 (S.I. No. 122) identifies the Commissioners of Public Works as the 'competent authority' with overall responsibility for implementation of the Floods Directive 2007/60/EC. The OPW is the principal agency involved in the preparation of CFRAM Studies.

### 1.4.4 Flood Risk Management Guidelines

#### 1.4.4.1 Introduction

In 2009, the OPW and the then Department of the Environment and Local Government (DEHLG) published Guidelines on flood risk management for planning authorities entitled *The Planning System and Flood Risk Management - Guidelines for Planning Authorities*. The Guidelines introduce mechanisms for the incorporation of flood risk identification, assessment and management into the planning process. Implementation of the Guidelines is intended to be achieved through actions at the national, regional, local authority and site-specific levels. Planning authorities and An Bord Pleanála are required to have regard to the Guidelines in carrying out their functions under the Planning Acts.

The core objectives of the Guidelines are to:

- Avoid inappropriate development in areas at risk of flooding;
- Avoid new developments increasing flood risk elsewhere, including that which may arise from surface water run-off;
- Ensure effective management of residual risks for development permitted in floodplains;
- Avoid unnecessary restriction of national, regional or local economic and social growth;
- Improve the understanding of flood risk among relevant stakeholders; and
- Ensure that the requirements of EU and national law in relation to the natural environment and nature conservation are complied with at all stages of flood risk management.

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<sup>1</sup> The PFRAs identified areas at risk of significant flooding and includes maps showing areas deemed to be at risk. The areas deemed to be most significant risk, where the flood risk that is of particular concern nationally, are identified as Areas for Further Assessment (AFAs). Dundalk was identified as an AFA. The OPW has undertaken a detailed assessment on the extent and degree of fluvial flood risk for various areas in County Louth, including these AFAs, producing Flood Extent Mapping.

#### 1.4.4.2 Principles of Flood Risk Management

The key principles of flood risk management set out in the flood Guidelines are to:

- Avoid development that will be at risk of flooding or that will increase the flooding risk elsewhere, where possible;
- Substitute less vulnerable uses, where avoidance is not possible; and
- Mitigate and manage the risk, where avoidance and substitution are not possible.

The Guidelines follow the principle that development should not be permitted in flood risk areas, particularly floodplains, except where there are no alternative and appropriate sites available in lower risk areas that are consistent with the objectives of proper planning and sustainable development.

Development in areas that have the highest flood risk should be avoided and/or only considered in exceptional circumstances (through a prescribed *Justification Test*) if adequate land or sites are not available in areas that have lower flood risk. Most types of development would be considered inappropriate in areas that have the highest flood risk. Only water-compatible development such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation and essential transport infrastructure that cannot be located elsewhere would be considered appropriate in these areas.

#### 1.4.4.3 Stages of SFRA

The Flood Risk Management Guidelines recommend a staged approach to flood risk assessment that covers both the likelihood of flooding and the potential consequences. The stages of appraisal and assessment are:

**Stage 1 Flood risk identification** – to identify whether there may be any flooding or surface water management issues related to either the area of Regional Spatial and Economic Strategies, Development Plans and LAP's or a proposed development site that may warrant further investigation at the appropriate lower-level plan or planning application levels.

**Stage 2 Initial flood risk assessment** – to confirm sources of flooding that may affect a Plan area or proposed development site, to appraise the adequacy of existing information and to scope the extent of the risk of flooding which may involve preparing flood zone maps. Where hydraulic models exist the potential impact of a development on flooding elsewhere and of the scope of possible mitigation measures can be assessed. In addition, the requirements of the detailed assessment are scoped.

**Stage 3 Detailed flood risk assessment** – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development or land to be zoned, of its potential impact on flood risk elsewhere and of the effectiveness of any proposed mitigation measures.

#### 1.4.4.4 Flood Zones

Flood risk is an expression of the combination of the flood probability or likelihood and the magnitude of the potential consequences of the flood event. It is normally expressed in terms of the following relationship:

$$\text{Flood risk} = \text{Likelihood of flooding} \times \text{Consequences of flooding}$$

Likelihood of flooding is normally defined as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. For example, a 1% Annual Exceedance Probability (AEP) indicates the severity of a flood that is expected to be exceeded on average once in 100 years, i.e. it has a 1 in 100 (1%) chance of occurring in any one year.

Consequences of flooding depend on the hazards associated with the flooding (e.g. depth of water, speed of flow, rate of onset, duration, wave-action effects, water quality) and the vulnerability of people, property and the environment potentially affected by a flood (e.g. the age profile of the population, the type of development and the presence and reliability of mitigation measures).

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and they are a key tool in flood risk management within the planning process as well as in flood warning and emergency planning.

There are three types of flood zones defined for the purposes of the Flood Guidelines:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all other areas that are not in zones A or B.

A summary of the requirements of the Flood Guidelines for land uses across each of the above flood zones is provided at Appendix I.

## 1.5 Emerging Information and Disclaimer

It is important to note that compliance with the requirements of the Flood Risk Management Guidelines is currently based on emerging and best available data at the time of preparing the assessment, including Flood Risk Management Plans, which will be updated on a cyclical basis.

Following adoption of the Plan, information in relation to flood risk may be altered in light of future data and analysis, by, for example, the OPW, or future flood events. As a result, all landowners and developers are advised that Louth County Council and their agents can accept no responsibility for losses or damages arising due to assessments of the vulnerability to flooding of lands, uses and developments. Owners, users and developers are advised to take all reasonable measures to assess the vulnerability to flooding of lands and buildings (including basements) in which they have an interest prior to making planning or development decisions.

Any future SFRA's for the Plan area or for the County will integrate other new and emerging data.

## **Section 2 Stage 1 SFRA - Flood Risk Identification**

### **2.1 Introduction**

Stage 1 SFRA (flood risk identification) has been undertaken in order to identify whether there may be any flooding or surface water management issues within or adjacent to zoned lands and consequently whether Stage 2 SFRA (flood risk assessment) should be proceeded to. It is reproduced in part this document.

Dundalk is located within the Neagh Bann River Basin for which the “Flood Risk Management Plan for the Neagh Bann River Basin (UOM06)” has been prepared. Stage 1 SFRA is based on existing information on flood risk indicators based on historical evidence and computational models. A selection of key indicators is mapped for Dundalk in Appendix II.

### **2.2 Drainage, Defences and Early Warning Systems**

With regard to areas benefitting from drainage and defences (flood relief scheme works), there are various measures that have been implemented in County Louth that will contribute towards flood risk management. These include the culverting of various streams and rivers in many urban areas and embankments.

There are no known defended areas with a National CFRAM confirmed 10% Annual Exceedance Probability (AEP) Standard of Protection that have been identified by the Council or the SFRA process. There are informal structures likely to provide levels of defence in places; however, these have not been designed by modern engineering methods and their effectiveness has not been confirmed. Following the completion of the Dundalk Flood Relief Scheme the Council will consider the inclusion of a register of key flood risk infrastructure in future land use plans for the town.

There are a number of Drainage Districts Channels occurring across the Plan area. Drainage Districts were carried out by the Commissioners of Public Works under a number of drainage and navigation acts from 1842 to the 1930s to improve land for agriculture and to mitigate flooding. Channels and lakes were deepened and widened, weirs removed, embankments constructed, bridges replaced or modified and various other work was carried out. The purpose of the schemes was to improve land for agriculture, by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows. Drainage Districts cover approximately 10% of the country, typically the flattest areas. Local authorities are charged with responsibility to maintain Drainage Districts. The Arterial Drainage Act, 1945 contains a number of provisions for the management of Drainage Districts in Part III and Part VIII of the act.

There are also Drainage Districts Embankments (walls of soil or sods that were erected to prevent flood water or high tides from entering land; drains and sluices or pumps were also provided to take away rainwater that fell behind the embankments) occurring along the Fane River in the south of the Plan area.

Benefited land, land that was drained as part of the Drainage District measures, are also identified within the Plan area.

The 2018 Flood Risk Management Plan (FRMP) for the Neagh Bann River Basin (UOM06) identifies various general measures applicable to the catchment under “Measures Applicable for all Areas”<sup>2</sup>.

The FRMP identifies the following existing measures for the Neagh Bann catchment in particular: Maintenance of Arterial Drainage Schemes<sup>3</sup>; and Maintenance of Drainage Districts<sup>4</sup>.

For Dundalk/ Blackrock South specifically, the FRMP identifies that the progression of a Flood Relief Scheme for Dundalk and Blackrock South is underway: “The proposed Dundalk and Blackrock South Flood Relief Scheme may include a series of hard defences, including flood embankments and walls, rock armour coastal protection, demountable barriers, road raising, a sluice gate and tanking of two properties, and channel conveyance improvements. The defences would be required along with improvement of channel conveyance on the Blackrock River and Dundalk Blackwater River, along with Storage on the Castletown River. These proposed measures are expected to provide protection to the 0.5% coastal events and the 1% AEP fluvial flood event.” Updates on the current status of the Scheme are available from the project website <https://www.floodinfo.ie/frs/en/dundalk/home/>.

The provision of flood protection measures can significantly reduce flood risk. However, the Ministerial Guidelines require that the presence of flood protection structures should be ignored in determining flood zones. This is because of risks relating to failure and severe flood events that exceed design capacity (the risk of severe events is exacerbated with climate change). Notwithstanding this, new development can proceed in areas that are at elevated levels of flood risk subject to the Justification Test provided for by the Guidelines being passed, which takes into account proposals to manage flood risk, such as the development of defences. Although insurance can be challenging to attain in these instances.

As provided for by the Louth County Development Plan 2021-2027 (as varied), it is a Council Policy Objective:

- To ensure that no development including clearing or storage of materials takes place within a minimum distance of 10m measured from each bank of any river, stream or watercourse (IU 25); and
- To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible (IU 34).

Met Éireann currently issues flood warnings for County Louth. Met Éireann, in collaboration with the OPW, is currently engaged in the establishment of a National Flood Forecasting and Warnings Service to forecast for fluvial and coastal flood events.

## 2.3 Other Flood Studies

Other Flood Studies considered in the preparation of this assessment include:

- Previous SFRAs in County Louth;
- Flood Risk Management Plan (Neagh Bann Basin), 2018;
- Regional Flood Risk Assessment for the Northern and Western Regional Spatial and Economic Strategy, 2020; and
- Emerging findings of the Dundalk Flood Relief Scheme Project, 2024.

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<sup>2</sup> Under the headings of:

- Prevention: Sustainable Planning and Development Management
- Prevention: Sustainable Urban Drainage Systems
- Prevention: Voluntary Home Relocation
- Prevention: Adaptation Planning
- Prevention: Land Use Management and Natural Flood Risk Management
- Protection: Maintenance of Channels Not Part of a Scheme
- Preparedness: Promotion of Individual and Community Resilience
- Preparedness: Flood Forecasting and Warning
- Preparedness: Emergency Response Planning
- Preparedness: Individual Property Protection
- Preparedness: Flood-Related Data Collection

<sup>3</sup> The OPW has a statutory duty under the Arterial Drainage Act, 1945, and the Amendment of the Act, 1995, to maintain the Arterial Drainage and Flood Relief Schemes constructed by it under those Acts.

<sup>4</sup> The statutory duty of maintenance for 4,600 km of river channel benefiting from Drainage District Schemes rests with the relevant Local Authorities.

## 2.4 Flood Risk Indicators

Indicators of flood risk that are based on historical flooding events are identified and described on Table 2. Indicators of flood risk that are based on computational models – predictive flood risk indicators – are identified and described on Table 3. A selection of the historical and predictive flood risk indicators that were considered by the SFRA are mapped at settlement level for Dundalk in Appendix II.

**Table 2 Historical Flood Risk Indicators**

Information Source	Description	Strategic Limitations
<b>Recorded Flood Events from the OPW</b>	A flood event is the occurrence of recorded flooding at a given location on a given date. The flood event is derived from different types of information (reports, photographs etc.).	This dataset only provides a spot location
<b>Recurring Flood Events</b>	A flood event that has occurred more than once at a certain area is named a recurring flood event.	This dataset only provides a spot location
<b>OPW Flood Extent</b>	A flood extent is an inundated area as recorded at a certain moment in time. This layer of information includes floods recorded in 1999/2000 and 1954.	Coverage limited
<b>Alluvium Soils</b>	Mineral alluvial soil mapping is indicative of recurrent or significant fluvial flooding at some point in the past and was generated by Teagasc with co-operation of the Forest Service, EPA and GSI. This project was completed May 2006.	Drainage may have changed significantly since these soils were deposited.
<b>Benefitting lands (OPW)</b>	Benefitting lands mapping is a dataset identifying land that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land estimated or reported to be subject to flooding or poor drainage.	Identifies broad areas - low resolution for flood risk management
<b>Drainage Districts (OPW)</b>	This drainage scheme mapping dataset was prepared on behalf of the Drainage Districts (Local Authorities with statutory responsibility for maintenance under the Arterial Drainage Act, 1925). These maps identify land that might benefit from the implementation of Arterial (Major) Drainage Schemes and indicate areas of land subject to flooding or poor drainage.	Identifies large broad areas - very low resolution for flood risk management
<b>Land Commission (OPW)</b>	This dataset indicates areas of land defended to some degree against flooding that were formerly the responsibility of the Land Commission.	Identifies broad areas - low resolution for flood risk management

**Table 3 Predictive Flood Risk Indicators**

Information Source	Description	Strategic Limitations
<b>CFRAM Study, Flood Extent Mapping, 2016</b>	Following the undertaking of the PFRA, the OPW, through its engineering consultants and working with local authorities and other stakeholders, conducted extensive engineering assessments to better understand and detail the actual risk from flooding for areas that were at highest levels of risk. This was the subject of public consultation. The outcome of that work includes Predicted Flood Extent maps that were finalised in 2016. For fluvial flood levels, calibration and verification of the models make use of the best available data including hydrometric records, photographs, videos, press articles and anecdotal information.	Spatial spread is limited, including to the areas that are considered to be at most risk of flooding.
<b>National Indicative Fluvial Mapping (NIFM) 2021</b>	The PFRA indicative flood maps have now been superseded by the NIFM published in 2021. The OPW NIFM project has produced second generation indicative fluvial flood spatial data that are of a higher quality and accuracy to those produced for the first cycle PFRA. This project has covered 27,000 km of river reaches, separated into 37 drainage areas, consisting of 509 sub-catchments. Data has been produced for catchments greater than 5km <sup>2</sup> in areas for which flood maps were not produced under the National CFRAM Programme and should be read in this context.	Does not cover smaller sized catchments less than 5km <sup>2</sup> .

Information Source	Description	Strategic Limitations
<p><b>National Coastal Flood Hazard Mapping 2021</b></p>	<p>The OPW's National Coastal Flood Hazard Mapping, completed in 2021, provides updated national scale coastal flood extent and depth maps. Maps were produced for the 50% (equivalent to a one in two-year event), 20%, 10%, 5%, 2%, 1%, 0.5% and 0.1% (equivalent to a one in 1000-year event) Annual Exceedance Probabilities for the present-day scenario and for future climate change scenarios, which represent increases in sea level.</p>	<p>Although widely accepted methods have been used to prepare the maps, there is a range of inherent uncertainties within the process of preparing the flood extent and depth maps. These include:</p> <ul style="list-style-type: none"> <li>• Uncertainties in the estimated extreme water levels: This can arise due to uncertainties in topographic and other survey data, meteorological data, assumptions and / or approximations in the hydraulic / hydrodynamic models in representing physical reality, assumptions in the hydraulic / hydrodynamic modelling, datum conversions, etc.</li> <li>• Uncertainties in the flood extents and depths: This can arise due to uncertainties in the estimated extreme water levels, topographic and other survey data, assumptions and / or approximations in the way that flooding spreads over a floodplain, etc. Due to the various sources of potential inaccuracies in the flood extent and depth maps, a quantitative assessment of their accuracy has not been carried out. A qualitative assessment of the maps was carried out as part of the quality control process. The flood extent and depth maps are therefore suitable for the assessment of flood risk at a strategic scale only, and should not be used to assess the flood hazard and risk associated with individual properties or point locations, or to replace a detailed flood risk assessment. The potential for inaccuracy should be recognised if these flood maps are to be used for any purpose.</li> </ul>

Information Source	Description	Strategic Limitations
<b>Emerging findings of the Dundalk Flood Relief Scheme Project, 2024</b>	<p>The 2016 Neagh Bann CFRAM Study model, developed during the national CFRAM programme, was reviewed with relevance to the Dundalk Flood Relief Scheme. The 2016 model has been expanded and refined to provide new flood extent and flood depth mapping for Dundalk and Blackrock. The following considerations were employed to refine and improve the CFRAM model:</p> <ul style="list-style-type: none"> <li>• Updated hydrological assessment of the scheme area;</li> <li>• New and more accurate topographical and threshold surveys;</li> <li>• Additional CCTV surveys of significant culverts and sewers;</li> <li>• Expansion of the model reflecting new infrastructure, changes to existing infrastructure and changes to watercourses since CFRAM;</li> <li>• A more refined model mesh size to improve accuracy of the model outputs;</li> <li>• A more conservative joint probability assessment of fluvial and coastal flooding; and</li> <li>• Sensitivity analysis to support the understanding of any uncertainties or assumptions associated with the model input parameters.</li> </ul>	Does not cover Fane sub-catchment in the south of the Plan area.
<b>Predictive groundwater flood mapping</b>	<p>The predictive groundwater flood map presents the probabilistic flood extents for locations of recurrent karst groundwater flooding. It consists of a series of stacked polygons at each site representing the flood extent for specific AEP's mapping floods that are expected to occur every 10, 100 and 1000 years (AEP of 0.1, 0.01, and 0.001 respectively). The map is focussed primarily (but not entirely) on flooding at seasonally inundated wetlands known as turloughs. Sites were chosen for inclusion in the predictive map based on existing turlough databases as well as manual interpretation of Synthetic Aperture Radar (SAR) imagery.</p> <p>The mapping process tied together the observed and SAR-derived hydrograph data, hydrological modelling, stochastic weather generation and extreme value analysis to generate predictive groundwater flood maps for over 400 qualifying sites.</p>	Not all turloughs are included in the predictive map as some sites could not be successfully monitored with SAR and/or modelled.

## 2.5 Conclusion

The information detailed above indicates elevated levels of flood risk in various locations across the town; therefore, a Stage 2 SFRA was proceeded to.

## Section 3 Stage 2 SFRA - Flood Risk Assessment

### 3.1 Introduction

Stage 2 SFRA (flood risk assessment) has been undertaken in order to:

- Confirm the sources of flooding that may affect zoned and adjacent areas;
- Appraise the adequacy of existing information as identified by the Stage 1 SFRA; and
- Scope the extent of the risk of flooding through the preparation of flood zone maps.

### 3.2 Findings and Adequacy of Existing Information and Delineation of Flood Zones

Desk and in-field studies were undertaken taking into account the following factors:

- Predictive indicators, including the emerging findings of the Dundalk Flood Relief Scheme Project;
- Historical indicators of flood risk;
- Documented Council knowledge of lands;
- The potential source and direction of flood paths from rivers and streams;
- Vegetation indicative of flood risk; and
- The locations of topographic/built features that coincide with the flood indicator related boundaries/topographical survey.

Within the annual exceedance probabilities specified by the Flood Guidelines for Flood Zones A and B, there are elevated levels of flood risk at certain areas in Dundalk, as shown in Appendix II.

### 3.3 Flood Risk Zone Mapping

Flood Risk Zone maps have been produced taking into account the findings of the Stage 1 and Stage 2 SFRA desk and in field studies as identified above<sup>5</sup>.

The Flood Risk Zone map for Dundalk is provided in Appendix II and identifies Flood Zone A (darker blue) and Flood Zone B<sup>6</sup> (lighter blue). All other areas fall within Flood Zone C. As per the Guidelines, the flood zones are as follow:

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);
- **Flood Zone B** – where the probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding). Flood Zone C covers all other areas that are not in zones A or B.

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<sup>5</sup> Including taking into account predictive and historical indicators of flood risk, documented Council knowledge of lands, Council Engineer review and input into indicators and flood zones (local knowledge), the potential source and direction of flood paths from rivers and streams, vegetation indicative of flood risk and the locations of topographic/built features that coincide with the flood indicator related boundaries/topographical survey.

<sup>6</sup> As identified by the Guidelines, in rivers with a well-defined floodplain or where the coastal plain is well defined at its rear, the limits of Zones A and B will virtually coincide. Zone B will only be significantly different in spatial extent from Zone A where there is extensive land with a gentle gradient away from the river or the sea.

### 3.4 Sensitivity to Climate Change

'The Planning System and Flood Risk Management Guidelines for Planning Authorities and Technical Appendices, 2009' recommends that a precautionary approach to climate change is adopted due to the level of uncertainty involved in the potential effects. In this regard, the Guidelines recommend:

- Recognising that significant changes in the flood extent may result from an increase in rainfall or tide events and accordingly adopting a cautious approach to zoning land in these potential transitional areas;
- Ensuring that the levels of structures designed to protect against flooding such as flood defences<sup>7</sup>, land raising or raised floor levels are sufficient to cope with the effects of climate change over the lifetime of the development they are designed to protect (normally 85-100 years); and
- Ensuring that structures to protect against flooding and the development protected are capable of adaptation to the effects of climate change when there is more certainty about the effects and still time for such adaptation to be effective.

The CFRAM Programme include maps for two potential future scenarios taking account of different degrees of climate impact, the Mid-Range Future Scenario (more likely to occur over the coming decades) and the High End Future Scenario (less likely to occur over the coming decades). Furthermore, the National Coastal Flood Hazard Mapping 2021 provides updated national scale coastal flood extent and depth maps for the present-day scenario and for various future scenario maps, representing projected future scenarios for the end of century (c. 2100).

A selection of Future Scenario Mapping is provided under Appendix II of this SFRA report, including mapping that shows the land uses that have been provided for in areas identified as being at risk under future climate scenarios. In compliance with the Guidelines, the Flood Zones identified by the SFRA are defined on the basis of current flood risk.

The Guidelines state that:

"A precautionary approach should be applied, where necessary, to reflect uncertainties in flooding datasets and risk assessment techniques and the ability to predict the future climate and performance of existing flood defences. Development should be designed with careful consideration to possible future changes in flood risk, including the effects of climate change and / or coastal erosion so that future occupants are not subject to unacceptable risks."

As per **Policy Objective INF 20**, with respect to climate change, Flood Risk Assessments shall apply the precautionary approach recommended in the Guidelines and shall consider climate change impacts and adaptation measures, including details of structural and non-structural flood risk management measures, such as those relating to floor levels, internal layout, flood-resistant construction, flood-resilient construction, emergency response planning and access and egress during flood events. The Local Area Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping, together with the allowances to be provided for future flood risk management provided in the OPW's (2019) Flood Risk Management Climate Change Sectoral Adaptation Plan and the guidance on potential future scenarios contained therein, should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.

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<sup>7</sup> Defended areas are highly sensitive to climate change as the likelihood of defence failure and resulting flooding increases.

### 3.5 Sustainable Drainage Systems and Surface Water Guidance and Strategy

As provided for by measures integrated into both the existing, already in force, Louth County Development Plan and the Local Area Plan (including the measures reproduced at Section 4 of this report), new developments will be required to incorporate the requirement for Sustainable Urban Drainage Systems (SuDS) where appropriate. In combination, these provisions contribute towards a sustainable drainage strategy for the Plan area.

It is likely that some or all of the following SuDS techniques will be applicable to key development sites<sup>8</sup> within Dundalk, including to manage surface water run-off:

- Rainwater harvesting
- Green roofs
- Infiltration systems
- Proprietary treatment systems
- Filter strips
- Filter drains
- Swales
- Bioretention systems
- Trees
- Pervious pavements
- Attenuation storage tanks
- Detention basins
- Ponds and wetlands

Each land use zoning objective, including those for opportunity sites, allows for a range of possible uses and the Local Area Plan, and associated County Development Plan, allow for a range of scales, heights, densities configurations/layouts and designs. The application of different SuDS techniques will be dependent on a combination of the site's characteristics and the development (when known) being considered.

Because of the infinite range of land use types and associated developments and designs that could occur on sites within the Plan area under this type of Plan<sup>9</sup>, the guidance from this SFRA is to consider the full range of SUDs available, taking into account the recommendations and information provided above and below. On key development/opportunity sites, in particular, integrated and area-based provision of SuDS and green infrastructure may be appropriate in order to avoid reliance on individual site by site solutions.

Some sites, such as those for which guidance is provided for below, will pose particular challenges for SuDS. The best practice manuals cited at the end of this sub-section should be considered in determining solutions at these and other development sites.

At sites with high groundwater levels:

- Infiltration techniques may be particularly challenging and shallow infiltration basins or permeable pavements, may be most appropriate.
- Storage and conveyance systems need to be kept above maximum groundwater levels and membranes of appropriate robustness should be used to line any tanks
- Locating storage tanks or lined sub-base systems below the maximum likely groundwater level can cause result in flotation and structural risks

<sup>8</sup> Including Key Development Areas (Mount Avenue Area; Raynoldstown Village; St. Nicholas Quarter; The Long Walk Quarter; Park Street/Francis Street and St Patrick's Church; and Dundalk Port), Character Areas (St. Nicholas Quarter; Park Street/Francis Street and St. Patrick's Church; Seatown; The Station Quarter; and The Marshes) and Key Locations for Economic Investment and Employment Generating Uses (Town Centre; Dundalk North Business Park, Armagh Road; Lands at the Ballymacscanlon Roundabout; Lands opposite Dundalk Racecourse; and Coe's Road Industrial Estate; Brewery Business Park and adjoining Employment Lands; and Mullagharlin Area)

<sup>9</sup> Refer to Louth County Development Plan Section 13.21 Land Use Zoning Objectives for the wide range of land uses possible at sites zoned with single land use zoning objectives.

At sites that are steeply sloping:

- Effective utilisation of SuDS storage capacity should be considered, which can benefit from aligning with contours of roads and other structures, where these sites are terraced. Terraced car-parking areas can allow for storage of water through pervious pavements. Basins on terraces can provide open space. The runoff catchment on these sites can also be divided into smaller sub catchments.
- Velocities in swales and basins due to the steep slope can be managed by using check dams in swales or in storage layers, such as below permeable pavements.
- The possibility of infiltrating water resurfacing downslope or to increase pressure on downslope structures, such as walls, causing them to fail should be considered.

At sites that are very flat:

- On very flat sites, it is often not possible to construct piped drainage systems with sufficient falls to achieve minimum self-cleansing velocities. The solution can involve the use of shallow SuDS components such as swales, pervious pavements or high-capacity linear drainage channels, often dividing the site into small sub-catchments and providing local combined storage and conveyance components.
- A slight fall on any subgrade exposed to water is preferred in order to avoid ponding of water and reduction in strength in the soil due to waterlogging. If this is not possible then reduction in strength should be taken into account in the structural design of tanks or pervious pavements.
- Pumping should be a last resort and only allowable in situations where guaranteed maintenance of the pumps can be ensured.

At sites that include areas of floodplain:

- Notwithstanding that all storage volume should normally be provided within the development footprint, outside of the floodplain, SuDS on floodplains can be effective in managing routine rainfall/treatment for frequent events.
- SuDS should be selected and designed taking account of the likely high groundwater table and vulnerability to erosion during periods of high flows/water levels and SuDS should not reduce floodplain storage or conveyance.
- Conveyance routes should limit grading and the creation of surface features that could either reduce floodplain capacity or be washed out in a flood.
- Surface discharge from SuDS should be dispersed with point discharges minimised or eliminated.
- All SuDS within or crossing a floodplain should take full consideration of the likely influence of river water levels on the design performance. Combined probability assessments may be required.
- Siltation and subsequent clearance after a flood event has subsided should also be taken into account in the design.

SuDS are effective technologies, which aim to reduce flood risk, improve water quality and enhance biodiversity and amenity.

The systems should aim to mimic the natural drainage of the application site to minimise the effect of a development on flooding and pollution of existing waterways. SuDS include devices such as swales, permeable pavements, filter drains, storage ponds, constructed wetlands, soakways and green roofs. The integration of nature-based solutions, such as amenity areas, ecological corridors and attenuation ponds, into public and private development initiatives, is applicable within the provisions of the Plan and should be encouraged. Applications for development should take into account, as appropriate, the Department of Housing, Local Government and Heritage's (2022) "Nature-based Solutions to the Management of Rainwater and Surface Water Runoff in Urban Areas - Water Sensitive Urban Design - Best Practice Interim Guidance Document".

In some exceptional cases, and at the discretion of the Council, where it is demonstrated that SuDS devices are not feasible, approval may be given to install underground attenuation tanks or enlarged pipes in conjunction with other devices to achieve the required water quality. Such alternative measures will only be considered as a last resort. Proposals for surface water attenuation systems should include maintenance proposals and procedures.

Urban developments, both within developments and within the public realm, should seek to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flood risk. Development proposals should be accompanied by a comprehensive SuDS assessment that addresses run-off rate, run-off quality and its impact on the existing habitat and water quality.

For larger sites (i.e. multiple dwellings or commercial units) master planning should ensure that existing flow routes are maintained, through the use of green infrastructure. In addition, where multiple individual proposals are being made SuDS should be integrated where appropriate and relevant.

All proposed development, should consider the impact of surface water flood risks on drainage design e.g. in the form of a section within the flood risk assessment (for sites in Flood Zone A or B) or part of a surface water management plan.

Pluvial flood risk is likely to be present in local areas, however; it is not taken into account in the delineation of flood zones. Furthermore, PFRA indicative pluvial maps (2012) are not considered to be reliable for the purposes of zoning or decision-making. Particular attention should be given to development in low-lying areas which may act as natural ponds for collection of run-off. The drainage design should ensure no increase in flood risk to the site, or the downstream catchment. Where possible, and particularly in areas of new development, floor levels should be at an appropriate height above adjacent roads and hard standing areas to reduce the consequences of any localised flooding. Where this is not possible, an alternative design appropriate to the location may be prepared.

Further to the above, proposals for development should consider the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2015 and any future update of this guidance and Greater Dublin Strategic Drainage Study documents in designing SuDS solutions, including the New Development Policy, the Final Strategy Report, the Code of Practice and "Irish SuDS: guidance on applying the GSDSDS surface water drainage criteria".

## Section 4 Flood and Drainage Provisions

### 4.1 Introduction

In order to comply with *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* (Department of the Environment, Heritage and Local Government and Office of Public Works, 2009) and Department of the Environment, Community and Local Government Circular (*PL 2/2014*) and in order to contribute towards flood risk management within the Plan area, the measures below have been integrated into the Dundalk Local Area Plan and the existing, already in force, Louth County Development Plan 2021-2027 (as varied).

### 4.2 Land Use Zoning

That Flood Zones identified by the SFRA were used in line with the requirements provided for by the Flood Guidelines for land uses in Flood Zones A and B.

### 4.3 Integration of flood risk management provisions into the Louth County Development Plan

Provisions relating to flood risk management have already been integrated into the Louth County Development Plan 2021-2027 (as varied). These are detailed on Table 4.

**Table 4 County Development Plan Provisions relating to Flood Risk Management**

Provision
<p><b>Section 10.2.5 Sustainable urban drainage systems and Surface Water</b></p> <p><b>IU 19</b> To require the use of Sustainable Drainage Systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality.</p> <p><b>IU 20</b> To require all development proposals meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse.</p> <p><b>IU 21</b> To seek to avoid the discharge of additional surface water to combined sewers and promote Sustainable Urban Drainage Systems (SuDS) and solutions to maximise the capacity of towns with combined drainage systems.</p> <p><b>IU 22</b> To ensure all new development incorporates appropriate measures to protect existing water bodies, through appropriate treatment of runoff. In particular, discharges from car parks shall be appropriately treated so as to remove pollutant materials.</p> <p><b>IU 23</b> To ensure all new developments provide for separated drainage systems.</p> <p><b>IU 24</b> To encourage particularly in buildings of increased height the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS) and which provide benefits for biodiversity, wherever possible.</p> <p><b>Section 10.3 Flood Risk Management</b></p> <p><b>IU 25</b> To ensure that no development including clearing or storage of materials takes place within a minimum distance of 10m measured from each bank of any river, stream or watercourse.</p> <p><b>IU 26</b> To reduce the risk of new development being affected by possible future flooding by:</p> <ul style="list-style-type: none"> <li>• Avoiding development in areas at risk of flooding and</li> <li>• Where development in floodplains cannot be avoided, taking a sequential approach to flood risk management based on avoidance, reduction and adaptation to the risk.</li> </ul>

Provision
<p><b>IU 27</b> To ensure all proposals for development falling within Flood Zones A or B are consistent with the “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” 2009. Proposals for development identified as being vulnerable to flooding must be supported by a site specific Flood Risk Assessment and demonstrate to the satisfaction of the Planning Authority that the development and its infrastructure will avoid significant risks of flooding and not exacerbate flooding elsewhere.</p> <p>In Flood Zone C, where the probability of flooding is low (less than 0.1%), site-specific Flood Risk Assessment may be required and the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed.</p> <p>The County Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping should be consulted by prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.</p> <p>Applications for development in flood vulnerable zones, including those at risk under the OPW’s Mid-Range Future Scenario, shall provide details of structural and non-structural risk management measures, such as those relating to floor levels, internal layout, flood-resilient construction, emergency response planning and access and egress during flood events.</p> <p><b>IU 28</b> Where a site specific Flood Risk Assessment demonstrates that there are significant residual flood risks to a proposed development or its occupiers in conflict with “The Planning System and Flood Risk Management – Guidelines for Planning Authorities” 2009, planning permission will normally not be granted unless the requirements of Section 5.28 ‘Assessment of minor proposals in areas of flood risk’ can be satisfied.</p> <p><b>IU 29</b> To implement the Flood Risk Management Measures as detailed in the Neagh Bann Flood Risk Management Plan, the Eastern Flood Risk Management Plan and the Dunleer Flood Risk Management Plan, ensuring that proposals for development support and do not impede the progression of these measures. Louth County Council will, in partnership with the Office of Public Works (OPW) deliver the following Flood Relief Schemes:</p> <ul style="list-style-type: none"> <li>• Dundalk, Blackrock and Ardee;</li> <li>• Drogheda and Baltray; and</li> <li>• Carlingford and Greenore.</li> </ul> <p><b>IU 30</b> To work with the Office for Public Works in the development and implementation of catchment-based strategies for the management of flood risk – including those relating to storage and conveyance.</p> <p><b>IU 31</b> To contribute towards the improvement and/or restoration of the natural flood risk management functions of flood plains subject to compliance with the environmental legislation and availability of resources.</p> <p><b>IU 32</b> To ensure each flood risk management activity is examined to determine actions required to embed and provide for effective climate change adaptation as set out in the OPW Climate Change Sectoral Adaptation Plan Flood Risk Management applicable at the time.</p> <p><b>IU 33</b> Where a portion of a site is at risk of flooding, the lands at risk will be subject to the sequential approach to ensure first and foremost that new development is directed towards lands at low risk of flooding; and to restrict the type of development to that ‘appropriate’ to each flood zone in accordance with Tables 3.1 and 3.2 of the Flood Risk Management Guidelines.</p> <p><b>IU 34</b> To consult with the Office of Public Works (OPW) in relation to proposed developments in the vicinity of drainage channels and rivers for which the OPW are responsible.</p> <p><b>IU 35</b> To consult with the Office of Public Works (OPW) in relation to proposed developments which include the construction, replacement or alteration of a bridge or culvert and to require that the developers obtain consent from the OPW under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations 2010 and Section 50 of the Arterial Drainage Act 1945, where appropriate.</p>

## 4.4 Integration of flood risk management provisions into the Local Area Plan

Further to the measures relating to land use zoning integrated into the LAP (see Section 4.2 above) and those already in force through the Louth County Development Plan 2021-2027 (as varied) (see Section 4.3 above), a number of other measures relating to flood risk and drainage have been integrated into the Local Area Plan as detailed on Table 5. In combination, these provisions contribute towards a sustainable drainage strategy for the Plan area (see also Section 3.5 of this document).

**Table 5 Local Area Plan Provisions relating to Flood Risk Management**

Provision
<p><b>9.4 Surface Water Management and Sustainable Urban Drainage System (SuDS)</b></p> <p><b>INF 7</b> To require the use of sustainable drainage systems to minimise and limit the extent of hard surfacing and paving and require the use of SuDS measures be incorporated in all new development (including extensions to existing developments). All development proposals shall be accompanied by a comprehensive SuDS assessment including run-off quantity, run off quality and impacts on habitat and water quality and should have particular regard to nature-based solutions and section 3.5 of the accompanying Strategic Flood Risk Assessment in Volume 4, 'Sustainable Urban Drainage Systems and Surface Water Guidance and Strategy'.<sup>10</sup></p> <p><b>INF 8</b> To require that all development proposals meet the design criteria, (adjusted to reflect local conditions), and material designs contained in the Greater Dublin Strategic Drainage Study (GDSDS) and demonstrate how runoff is captured as close to source as possible with subsequent slow release to the drainage system and watercourse.</p> <p><b>INF 9</b> To seek to avoid the discharge of additional surface water to combined sewers and promote Sustainable Urban Drainage Systems (SuDS) and solutions to maximise the capacity of Dundalk's combined drainage system.</p> <p><b>INF 10</b> To ensure all new developments provide for separated drainage systems.</p> <p><b>INF 11</b> To promote rainwater harvesting and grey water use in all developments and in particular for larger developments, as an alternative to attenuation.</p> <p><b>INF 12</b> To encourage in all buildings, and particular in buildings of increased height, the provision of green roofs and green walls as an integrated part of Sustainable Drainage Systems (SuDS), wherever possible.</p> <p><b>INF 13</b> To encourage the use of Nature based Sustainable Urban Drainage System (NbSUDS), when feasible, where streetscape enhancement programmes or resurfacing programmes are planned.</p> <p><b>9.6 Flood Risk Management</b></p> <p><b>INF 17</b> To support the progression of the Dundalk and Blackrock Flood Relief Scheme and the delivery of associated infrastructure critical to the implementation of the Scheme; and to prohibit development that could prejudice the future delivery of the Scheme.</p> <p><b>INF 18</b> To work closely with the OPW, property owners and other stakeholders in the progression and delivery of the Dundalk and Blackrock Flood Relief Scheme.</p>

<sup>10</sup> Because of the infinite range of land use types and associated developments and designs that could occur on sites under this Plan, the full range of SuDS available should be considered, taking into account the recommendations and information provided in Section 3.5 of the SFRA report.

Provision
<p><b>INF 19</b> To require all proposals for development falling within or adjacent to an identified flood zone(s) to submit a site-specific flood risk Assessment, based on the most up to date information available, that demonstrates that the proposal identifies all sources of flood risk to and from the proposed development, can adequately manage and mitigate any flood risk arising from the development including details of any structural and non-structural risk management measures (e.g. floor levels, flood-resilient construction etc.), and will not exacerbate flood risk elsewhere<sup>11,12</sup>.</p> <p><b>INF 20</b> With respect to climate change, Flood Risk Assessments shall apply the precautionary approach recommended in the Guidelines and shall consider climate change impacts and adaptation measures, including details of structural and non-structural flood risk management measures, such as those relating to floor levels, internal layout, flood-resistant construction, flood-resilient construction, emergency response planning and access and egress during flood events. The Local Area Plan SFRA datasets and the most up to date CFRAM Programme climate scenario mapping, together with the allowances to be provided for future flood risk management provided in the OPW's (2019) Flood Risk Management Climate Change Sectoral Adaptation Plan and the guidance on potential future scenarios contained therein, should be consulted by</p>

<sup>11</sup> More information on requirements in relation to Structural and Non-Structural Risk Management Measures are provided in a footnote to this Policy Objective at Table 5 of the accompanying SFRA report in Volume 4.

<sup>12</sup> Applications for development in flood vulnerable zones shall provide details of structural and non-structural risk management measures to include, but not be limited to specifications of the following:

#### *Floor Levels*

In areas of limited flood depth, the specification of the threshold and floor levels of new structures shall be raised above expected flood levels to reduce the risk of flood losses to a building, by raising floor heights within the building structure using a suspended floor arrangement or raised internal concrete platforms.

When designing an extension or modification to an existing building, an appropriate flood risk reduction measure shall be specified to ensure the threshold levels into the building are above the design flood level. However, care must also be taken to ensure access for all is provided in compliance with Part M of the Building Regulations.

Where threshold levels cannot be raised to the street for streetscape, conservation or other reasons, the design shall specify a mixing of uses vertically in buildings - with less vulnerable uses located at ground floor level, along with other measures for dealing with residual flood risk.

#### *Internal Layout*

Internal layout of internal space shall be designed and specified to reduce the impact of flooding [for example, living accommodation, essential services, storage space for provisions and equipment shall be designed to be located above the predicted flood level]. In addition, designs and specifications shall ensure that, wherever reasonably practicable, the siting of living accommodation (particularly sleeping areas) shall be above flood level.

With the exception of single storey extensions to existing properties, new single storey accommodation shall not be deemed appropriate where predicted flood levels are above design floor levels. In all cases, specifications for safe access, refuge and evacuation shall be incorporated into the design of the development.

#### *Flood-Resistant Construction*

Developments in flood vulnerable zones shall specify the use of flood-resistant construction aimed at preventing water from entering buildings - to mitigate the damage floodwater caused to buildings.

Developments shall specify the use of flood resistant construction prepared using specialist technical input to the design and specification of the external building envelope - with measures to resist hydrostatic pressure (commonly referred to as "tanking") specified for the outside of the building fabric.

The design of the flood resistant construction shall specify the need to protect the main entry points for floodwater into buildings - including doors and windows (including gaps in sealant around frames), vents, air-bricks and gaps around conduits or pipes passing through external building fabric.

The design of the flood resistant construction shall also specify the need to protect against flood water entry through sanitary appliances as a result of backflow through the drainage system.

#### *Flood-Resilient Construction*

Developments in flood vulnerable zones that are at risk of occasional inundation shall incorporate design and specification for flood resilient construction which accepts that floodwater will enter buildings and provides for this in the design and specification of internal building services and finishes. These measures limit damage caused by floodwater and allow relatively quick recovery.

This can be achieved by specifying wall and floor materials such as ceramic tiling that can be cleaned and dried relatively easily, provided that the substrate materials (e.g. blockwork) are also resilient. Electrics, appliances and kitchen fittings shall also be specified to be raised above floor level, and one-way valves shall be incorporated into drainage pipes.

#### *Emergency Response Planning*

In addition to considering physical design issues for developments in flood vulnerable zones, the developer shall specify that the planning of new development also takes account of the need for effective emergency response planning for flood events in areas of new development.

Applications for developments in flood vulnerable zones shall provide details that the following measures will be put in place and maintained:

- Provision of flood warnings, evacuation plans and ensuring public awareness of flood risks to people where they live and work;
- Coordination of responses and discussion with relevant emergency services i.e. Local Authorities, Fire and Rescue, Civil Defence and An Garda Síochána through the SFRA; and
- Awareness of risks and evacuation procedures and the need for family flood plans.

#### *Access and Egress During Flood Events*

Applications for developments in flood vulnerable zones shall include details of arrangements for access and egress during flood events. Such details shall specify that: flood escape routes have been kept to publicly accessible land; such routes will have signage and other flood awareness measures in place, to inform local communities what to do in case of flooding; and this information will be provided in a welcome pack to new occupants.

#### *Further Information*

Further and more detailed guidance and advice can be found at <http://www.flooding.ie> and in the Building Regulations.

**Provision**

prospective applicants for developments in this regard and will be made available to lower-tier Development Management processes in the Council.

**INF 21**

Uses under all zoning objectives (apart from where the Justification Test outlined in the Flood Risk Management Guidelines has been passed or where the uses comprise minor development in existing developed areas, as outlined in Section 5.28 of the Guidelines as amended by Circular PL 2/2014) shall be limited to water-compatible uses in Flood Zone A, and less vulnerable or water-compatible uses in Flood Zone B<sup>13</sup>. Detailed, site-specific Flood Risk Assessment will be required in these areas. This limitation shall take primacy over any other provision relating to these land use zoning objectives. The Justification Test has been passed for the following Land Use Zonings:

- Lands east of Bellews Bridge Road and north of Castletown Road, zoned A1 Existing Residential and A2 New Residential Phase 1 (Site 10 on SFRA Report Table 6 "Justification Tests");
- Dundalk Central Map 1, zoned A1 Existing Residential, B2 Neighbourhood Centre, B4 District Centre, C1 Mixed Use, E1 General Employment and G1 Community Facilities (Site 11 on SFRA Report Table 6 "Justification Tests");
- Dundalk Central Map 2, zoned A1 Existing Residential, B1 Town Centre, C1 Mixed Use, C2 Port Harbour Area, E1 General Employment, and G1 Community Facilities (Site 12 on SFRA Report Table 6 "Justification Tests");
- Lands built out north of Castletown River, zoned A1 Existing Residential and E1 General Employment (Site 13 on SFRA Report Table 6 "Justification Tests");
- Lands along the Point Road, zoned A1 Existing Residential (Site 14 on SFRA Report Table 6 "Justification Tests");
- Main Street, Blackrock, zoned B1 Town Centre (Site 17 on SFRA Report Table 6 'Justification Tests'); and
- Lands west of Hill Street Bridge, zoned C1 Mixed Use (Site 18 on SFRA Report Table 6 'Justification Tests').

**Section 3.4.2 Spot Objective H - Lands west of Hill Street Bridge**

Any development within the Flood Zone in this location shall be restricted to the provision of a vehicular and active travel access and service roads and ancillary infrastructure and other 'less Vulnerable development' as set out in Table 3.1 of 'The Planning System and Flood Risk Management Guidelines' (2009).

**Section 9.6.2 Benefitting Lands**

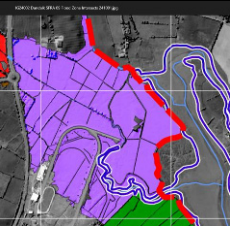
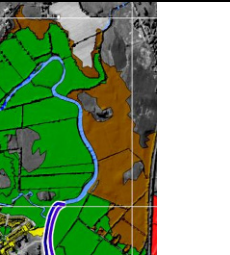

New developments proposed on lands benefitting from drainage district measures shall preserve access for maintenance. Applications for development on land identified as benefitting land may be prone to flooding, and as such site-specific flood risk assessments may be required in these areas.

## 4.5 Justification Tests

In order to meet the objectives of proper planning and sustainable development various uses are provided for in Flood Zones A and B. These uses have been subject to Justification Tests, as required by the Flood Guidelines, informed by the Council, which examine such proposals against various criteria - as detailed on Table 4.




<sup>13</sup> Any amendments to extant permissions in Flood Zones A or B that have commenced development and construction is ongoing will be considered on a case-by-case basis and will require an updated site-specific flood risk assessment to be carried out.

**Table 6 Justification Tests**



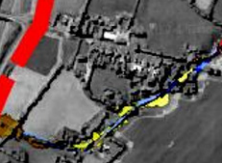
Site	Zoning in Draft Plan	Flood Zone	Justification Test (Fails, if one of the following fails; all must be passed for the test to be passed)					Overall Justification Test Result  (Fail or Pass)		
			Settlement targeted for growth under the NPF, RSES and/or CDP?	Is the zoning of the lands required to achieve the proper planning and sustainable development of the settlement and in particular has the required sub-criteria been satisfied <sup>14</sup> ?						
				(i) – see footnote	(ii) – see footnote	(iii) – see footnote	(iv) – see footnote		(v) – see footnote	
 <p><b>Site 1</b> Dundalk Racecourse 54°01'25.5"N 6°22'49.2"W</p>	D1 Tourism	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>
 <p><b>Site 2</b> Lands to west of Armagh Road at Sportsman hall 54.026721, -6.411582</p>	E1 General Employment	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>
 <p><b>Site 3</b> Lands to east of Armagh Road adjacent Lios Dubh 54.020940, -6.404004</p>	A2 New Residential Phase 1	B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>

<sup>14</sup> (i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement; (ii) Comprises significant previously developed and/or under-utilised lands; (iii) Is within or adjoining the core of an established or designated urban settlement; (iv) Will be essential in achieving compact and sustainable urban growth; and (v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement.

Strategic Flood Risk Assessment for the Dundalk Local Area Plan 2025-2031




 <p><b>Site 4</b> Lands to the east of Armagh road and west of Doylesfort Road 54.019138, -6.400323</p>	A2 New Residential Phase 1	B	Yes	No	No	No	Yes – this is an infill site	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. however as part of a planning application on these lands (24/60321) a Site Specific Flood Risk Assessment was carried out which sets out a series of mitigating measures to demonstrate flood risk to the site can be adequately managed. Furthermore, Policy Objective INF 21 from the Plan would limit future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>
 <p><b>Site 5</b> Lands north of Lismullen Grove</p>	A1 Existing Residential	B	Yes	No	No	No	Yes – this is an infill site	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>
 <p><b>Site 6</b> Lands south of the Castletown Road</p>	G1 Community Facilities and A1 Existing Residential	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for “Open Space”.</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 “shall take primacy over any other provision relating to these land use zoning objectives”.</p>

Strategic Flood Risk Assessment for the Dundalk Local Area Plan 2025-2031

 <p><b>Site 7</b> Racecourse Meadows, south of Racecourse Road. 54.017236, -6.389108</p>	A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. However, there is an extant permission for a residential development on these lands that is currently under construction. Any future amendments or development on these lands will be subject to a site-specific flood risk assessment. Furthermore, Policy Objective INF 21 from the Plan would limit future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".<sup>15</sup></p>
 <p><b>Site 8</b> Lands on the Racecourse at the junction with inner relief road 54.017236, -6.389108</p>	A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".</p>
 <p><b>Site 9</b> Lands west of Greyacre Road between M1 54.015323, -6.442884</p>	E1 General Employment and A2 New Residential Phase 1	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".</p>

<sup>15</sup> With respect to Site 7, when preparing future land use plans for the town, the Council will consider substituting a land use zoning appropriate to the level of flood risk at this location, should the development in the area not go ahead or planning lapses with no permission to renew it.

Strategic Flood Risk Assessment for the Dundalk Local Area Plan 2025-2031

 <p><b>Site 10</b> Lands east of Bellews Bridge Road and north of Castletown Road 54.015771, -6.420011</p>	<p>A1 Existing Residential and A2 New Residential Phase 1</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes these are lands</p>	<p>Yes</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report<sup>16</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>Pass</p>
 <p><b>Site 11</b> Dundalk Central Map 1</p>	<p>A1 Existing Residential, B2 Neighbourhood Centre, B4 District Centre, C1 Mixed Use, E1 General Employment and G1 Community Facilities</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report<sup>17</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>Pass</p>
 <p><b>Site 12</b> Dundalk Central Map 2</p>	<p>A1 Existing Residential, B1 Town Centre, C1 Mixed Use, C2 Port Harbour Area, E1 General Employment, and G1 Community Facilities.</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report<sup>18</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>Pass</p>

<sup>16</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.



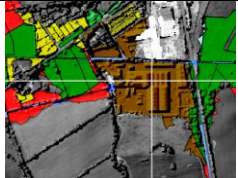
<sup>17</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

<sup>18</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

Strategic Flood Risk Assessment for the Dundalk Local Area Plan 2025-2031

 <p><b>Site 13</b> Lands built out north of Castletown River</p>	<p>A1 Existing Residential and E1 General Employment</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report <sup>19</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>Pass</p>
 <p><b>Site 14</b> Lands along the Point Road and either side of N2</p>	<p>A1 Existing Residential, E1 general Employment and J2 Public Infrastructure B5 Retail, Leisure and Recreation G1 Community uses.</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report <sup>20</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>Pass</p>
 <p><b>Site 15</b> Brewery Business Park and Ardee Road 53.990870, -6.410978</p>	<p>E1 General Employment, A1 Existing Residential</p>	<p>A and B</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>Yes</p>	<p>No</p>	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks. A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space". Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	<p>The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".</p>


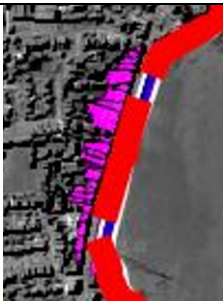

<sup>19</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

<sup>20</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 25, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33, IU 34 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

Strategic Flood Risk Assessment for the Dundalk Local Area Plan 2025-2031

 <p><b>Site 16</b> Blackrock area</p>	A1 Existing Residential B1 Town or Village Centre	A and B	Yes	No	No	No	No	No	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	The land use zoning at this site failed the Justification Test. Subsequently, the meaning of the zoning was altered by the integration of Policy Objective INF 21 into the Plan, which limits future development/ grants of permission in line with the Guidelines. The limitation provided by Policy Objective INF 21 "shall take primacy over any other provision relating to these land use zoning objectives".
 <p><b>Site 17</b> Blackrock Central</p>	B1 Town or Village Centre	A and B	Yes	Yes	Yes	Yes	Yes	Yes	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report<sup>21</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	Pass
 <p><b>Site 18:</b> Lands adjacent to Hill Street Bridge</p>	C1 Mixed Use Zoning	A and B	Yes	Yes	Yes	Yes	Yes	Yes	<p>A Stage 1 and 2 Flood Risk Assessment has been undertaken as part of the plan preparation process. This level of assessment is considered appropriate and has informed the zoning proposals and policies and objectives contained in the Plan. Section 4 of the SFRA outlines the measures integrated into Plan to adequately manage flood risks.</p> <p>A precautionary approach has been applied to the zoning of lands with undeveloped lands that is liable to flood generally zoned for "Open Space".</p> <p>Future development will: be subject to site-specific flood risk assessments; and comply with the flood risk management provisions of the Plan (see Section 4 above), including structural and non-structural risk management measures as detailed in the footnote associated with Table 5 in this Report<sup>22</sup>. This is in order to ensure that flood hazard and risk to the area and to other adjoining locations will not be increased or, if practicable, will be reduced. Overlaps between Land Use Zoning and Flood Zones have been mapped to clearly indicate lands constrained by flood risk. Development is subject to the policies, objectives and requirements of the Plan that relate to flood risk and climate change.</p>	Pass

<sup>21</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32 and IU 33.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

<sup>22</sup> Potentially applicable flood risk management related provisions will include:

- County Development Plan Provisions relating to Flood Risk Management: IU 19, 20, IU 21, IU 22, IU 23, IU 24, IU 26, IU 27, IU 28, IU 29, IU 30, IU 31, IU 32, IU 33 and IU 35.
- Local Area Plan Provisions relating to Flood Risk Management: INF 7, INF 8, INF 9, INF 10, INF 11, INF 12, INF 13, INF 17, INF 18, INF 19 and INF 20.

## Section 5 Conclusion

Louth County Council has prepared and adopted a Local Area Plan (LAP) for Dundalk under the Planning and Development Act 2000 (as amended). The Plan sets out an overall strategy for the proper planning and sustainable development over the years 2025-2031.

The LAP should be read in conjunction with the Louth County Development Plan 2021-2027 (as varied), which sets out the overarching development strategy for the County. Where conflicting policy objectives arise between the County Development Plan and the LAP, the policy objectives of the relevant County Development Plan shall take precedence.

The general development management standards, zoning descriptions and policies and objectives in the County Development Plan (including provisions relating to flood risk management and drainage) apply to the Plan area, while additional policy objectives that are specific to Dundalk are included in the LAP.

In addition, land use zoning contained within the Plan has been informed by the SFRA process and associated delineation of flood risk zones. The detailed Plan preparation process undertaken by the Planning Department combined with specialist input from the SFRA process facilitated zoning that helps to avoid inappropriate development being permitted in areas of high flood risk.

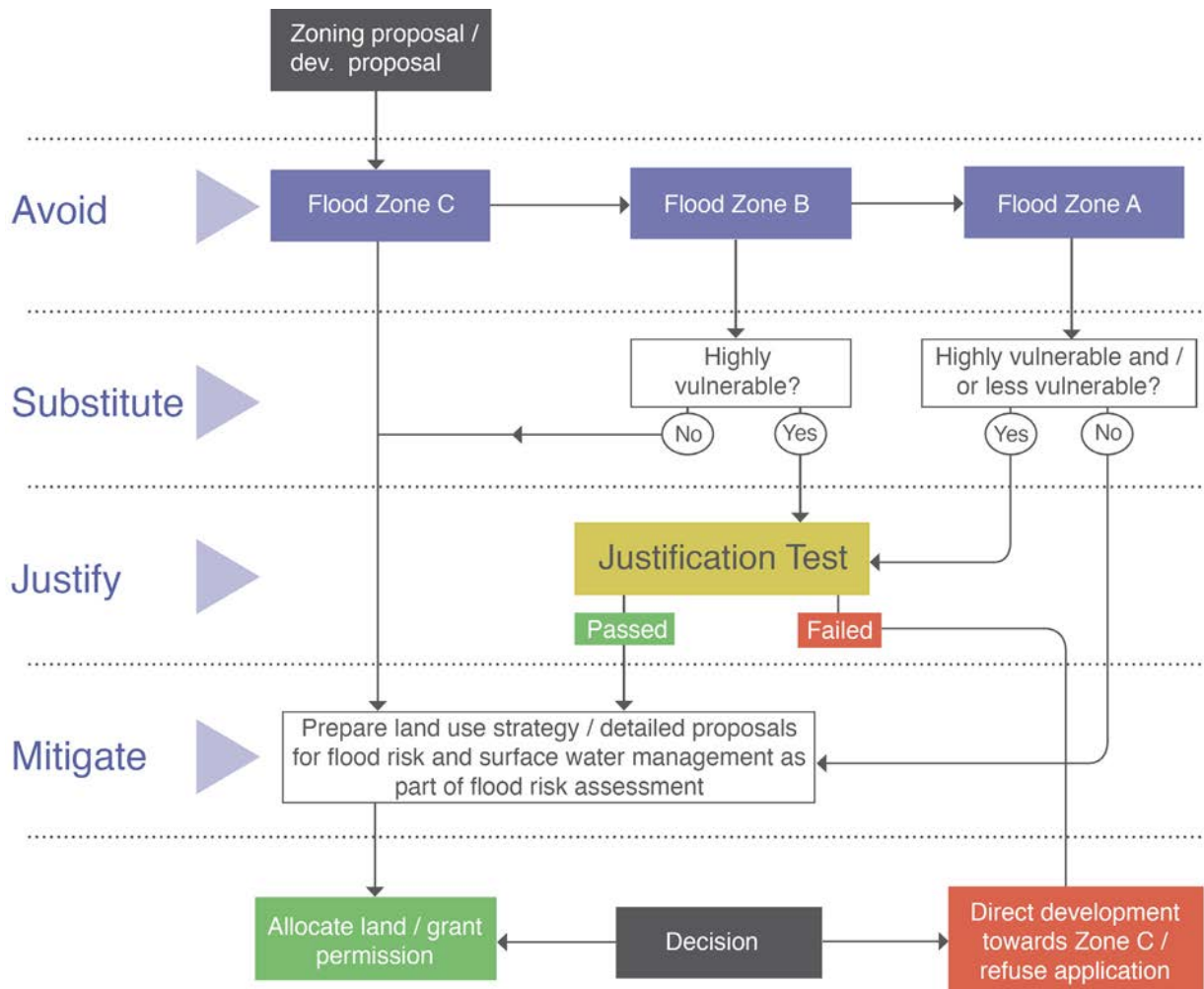
## **Appendix I: Summary of the requirements of the Flood Guidelines for land uses in Flood Zones**

Requirements relating to land uses in Flood Zones as set out in the Department of Environment, Heritage and Local Government (DEHLG) and Office of Public Works (OPW) 2009 Flood Guidelines (including at Chapter 3 Principles and Key Mechanisms and Chapter 5 Flooding and Development Management) and Departmental Circular PL2/2014 should be adhered to.

### **- The Sequential Approach, including the Justification test -**

The key principles of the Guidelines' risk-based sequential approach (see Figure 1) are:

- Avoid development in areas at risk of flooding. If this is not possible, consider substituting a land use that is less vulnerable to flooding. Only when both avoidance and substitution cannot take place should consideration be given to mitigation and management of risks.
- Inappropriate types of development that would create unacceptable risks from flooding should not be planned for or permitted.
- Exceptions to the restriction of development due to potential flood risks are provided for through the use of a Justification Test, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated.



**Figure 1 Sequential Approach Process<sup>23</sup>**

In summary, the **planning implications** for each of the flood zones are:

**Zone A** - High probability of flooding. Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

**Zone B** - Moderate probability of flooding. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

**Zone C** - Low probability of flooding. Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but

<sup>23</sup> Flood Zone C covers all areas outside of Zones A and B

would need to meet the normal range of other proper planning and sustainable development considerations.

Table 7 overleaf classifies the vulnerability of different types of development while Table 8 identifies the appropriateness of development belonging to each vulnerability class within each of the flood zones as well as identifying what instances in which the Justification Test should be undertaken. Inappropriate development that does not meet the criteria of the Justification Test should not be considered at the plan-making stage or approved within the development management process.

**Table 7 Classification of vulnerability of different types of development**

Vulnerability class	Land uses and types of development which include*:
<b>Highly vulnerable development (including essential infrastructure)</b>	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children’s homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.</p>
<b>Less vulnerable development</b>	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
<b>Water-compatible development</b>	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>
*Uses not listed here should be considered on their own merits	

**Table 8 Vulnerability Classes and Flood Zones**

	Flood Zone A	Flood Zone B	Flood Zone C
Highly vulnerable development (including essential infrastructure)	Justification Test	Justification Test	Appropriate
Less vulnerable development	Justification Test	Appropriate	Appropriate
Water-compatible development	Appropriate	Appropriate	Appropriate

The **Justification Test** which is referred to as part of the Sequential Approach is an assessment of whether a development proposal within an area at risk of flooding meets specific criteria for proper planning and sustainable development and demonstrates that it will not be subject to unacceptable risk nor increase flood risk elsewhere. The Justification Test should be applied only where development is within flood risk areas that would be defined as inappropriate under the screening test of the sequential risk based approach outlined above. This Justification Test is shown below.

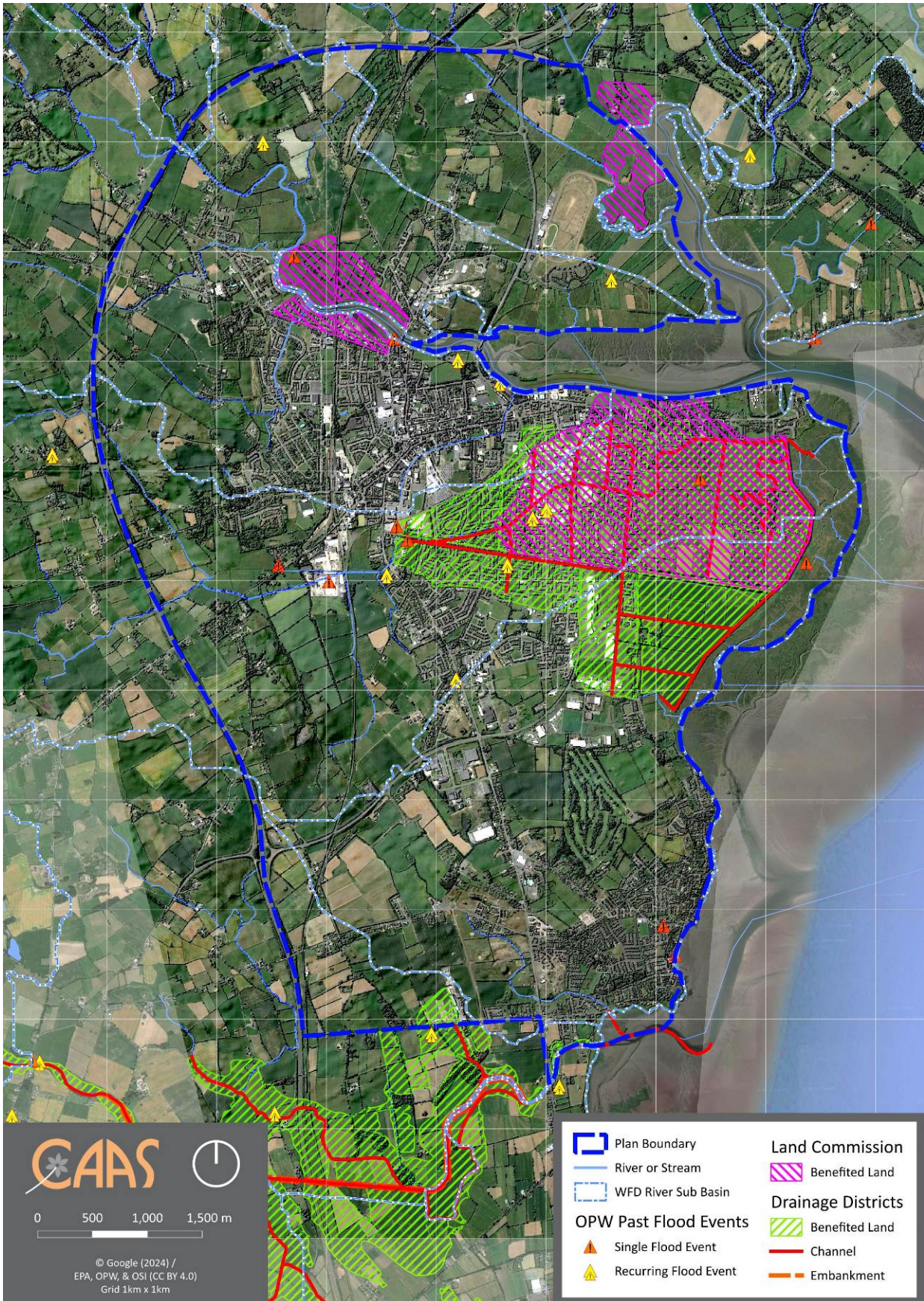
Where, as part of the preparation and adoption or variation and amendment of a development/local area plan<sup>1</sup>, a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2, all of the following criteria must be satisfied:

- 1 The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.
  - 2 The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:
    - (i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement<sup>2</sup>;
    - (ii) Comprises significant previously developed and/or under-utilised lands;
    - (iii) Is within or adjoining the core<sup>3</sup> of an established or designated urban settlement;
    - (iv) Will be essential in achieving compact and sustainable urban growth; and
    - (v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement<sup>4</sup>.
  - 3 A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere.
- N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.

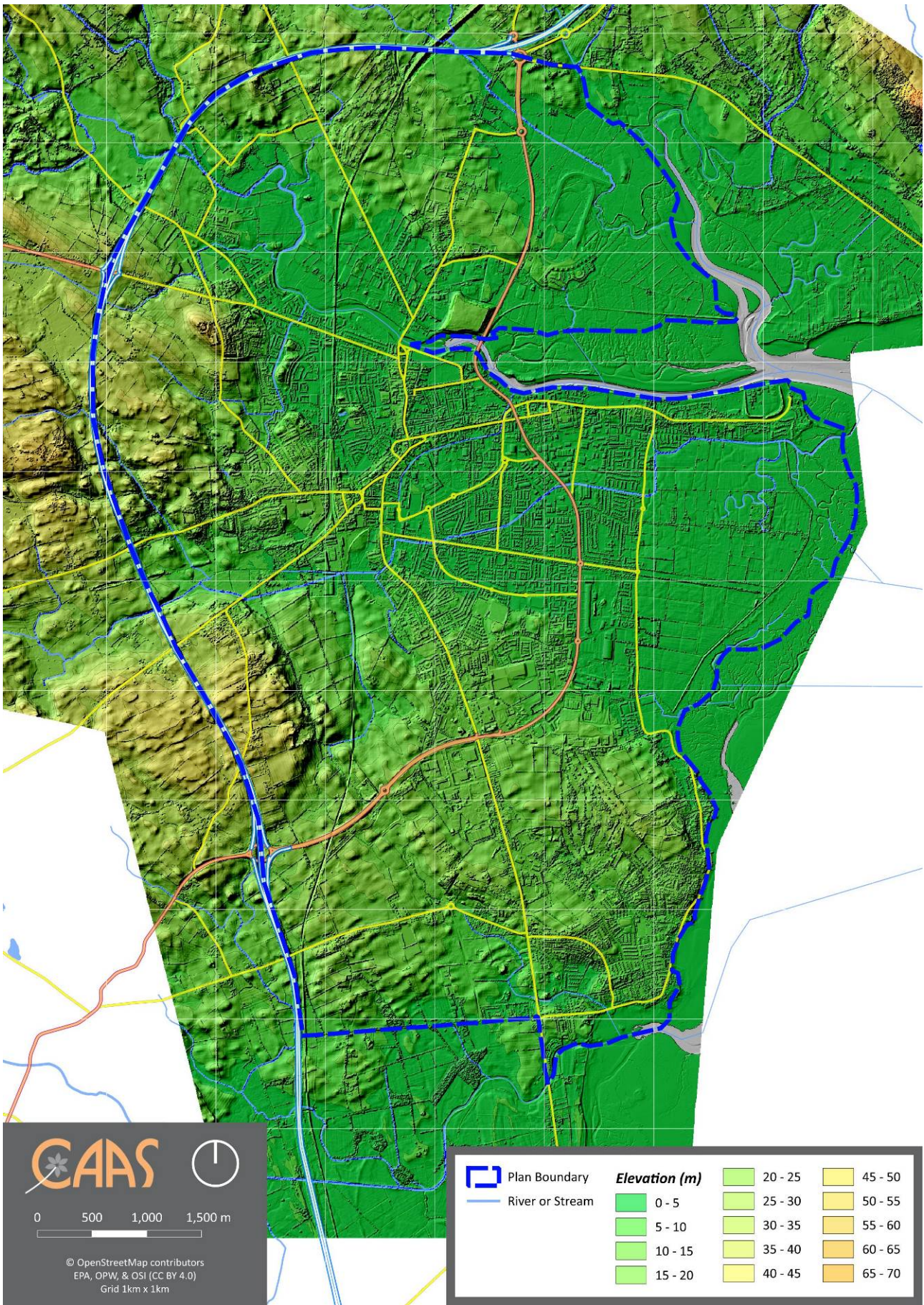
**Figure 2 Justification Test<sup>24</sup>**

<sup>24</sup> Footnotes: <sup>1</sup> Including Strategic Development Zones and Section 25 Schemes in the area of the Dublin Docklands Development Authority <sup>2</sup>In the case of Gateway planning authorities, where a number of strategic growth centres have been identified within the overall area of the authority, the Justification Test may be applied for vulnerable development within each centre. <sup>3</sup> See definition of the core of an urban settlement in Glossary of Terms. <sup>4</sup> This criterion may be set aside where section 4.27b applies.

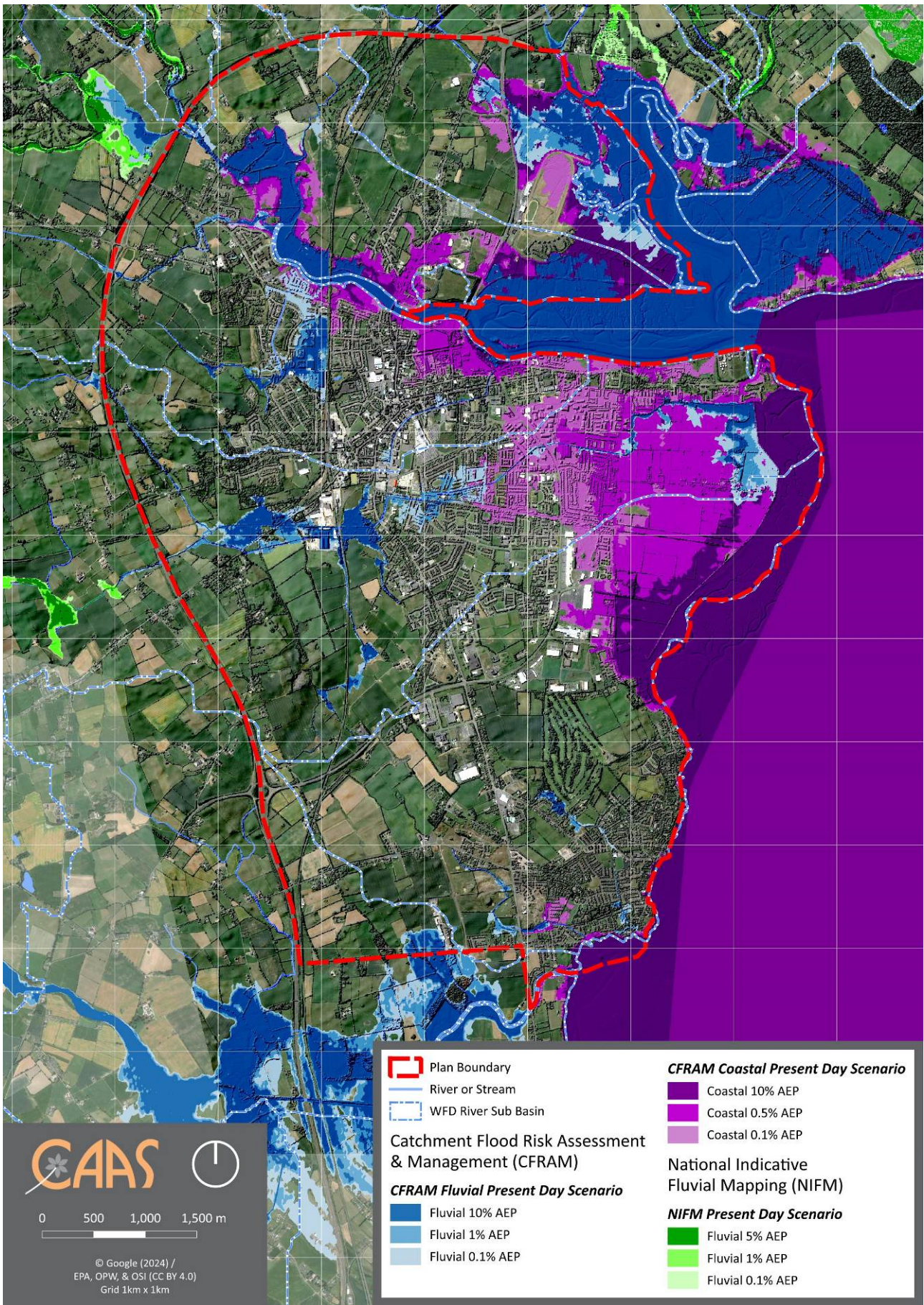
# Appendix II: Selection of Flood Risk Indicator Mapping and Flood Zone Mapping



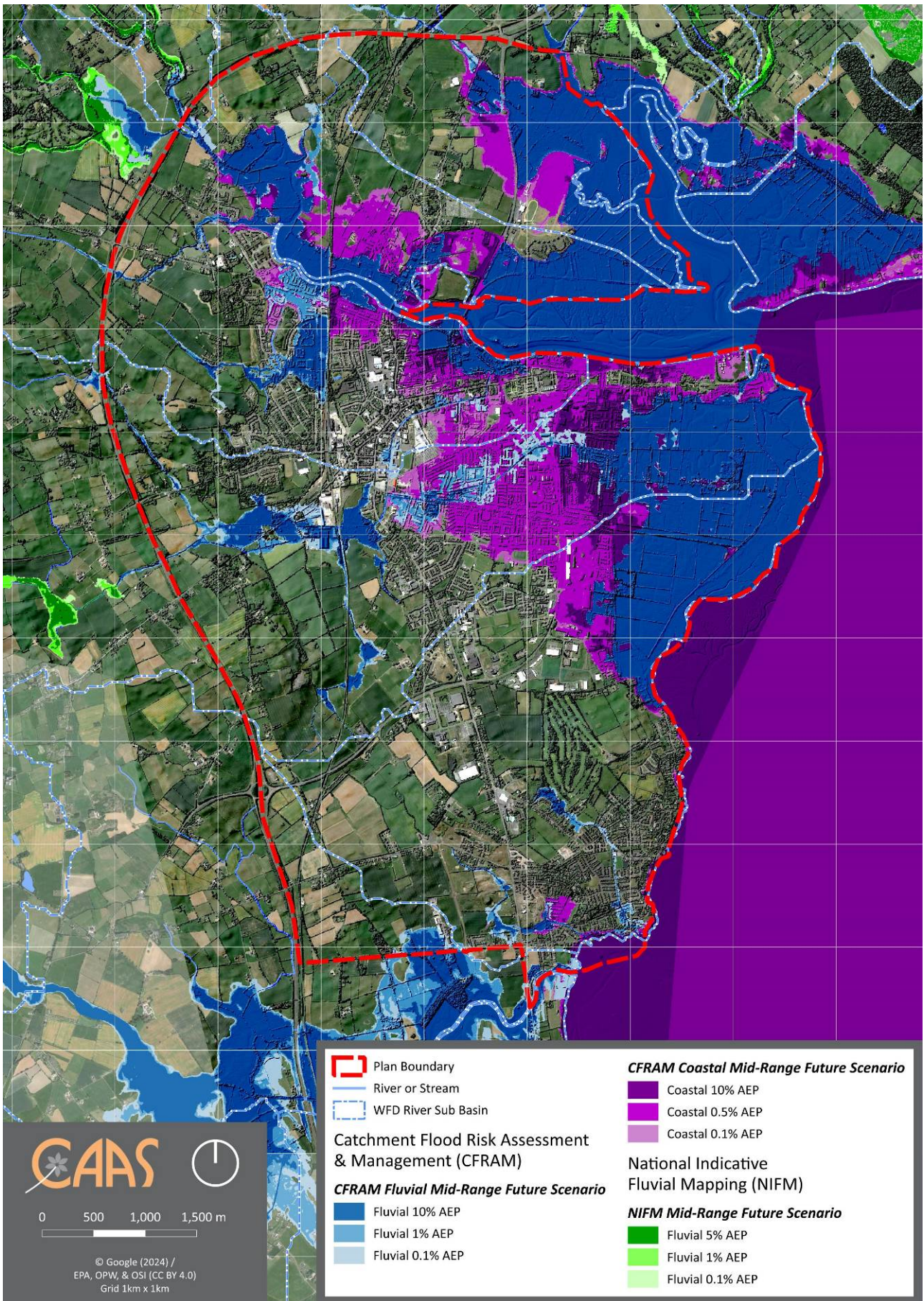
## Historical Indicators



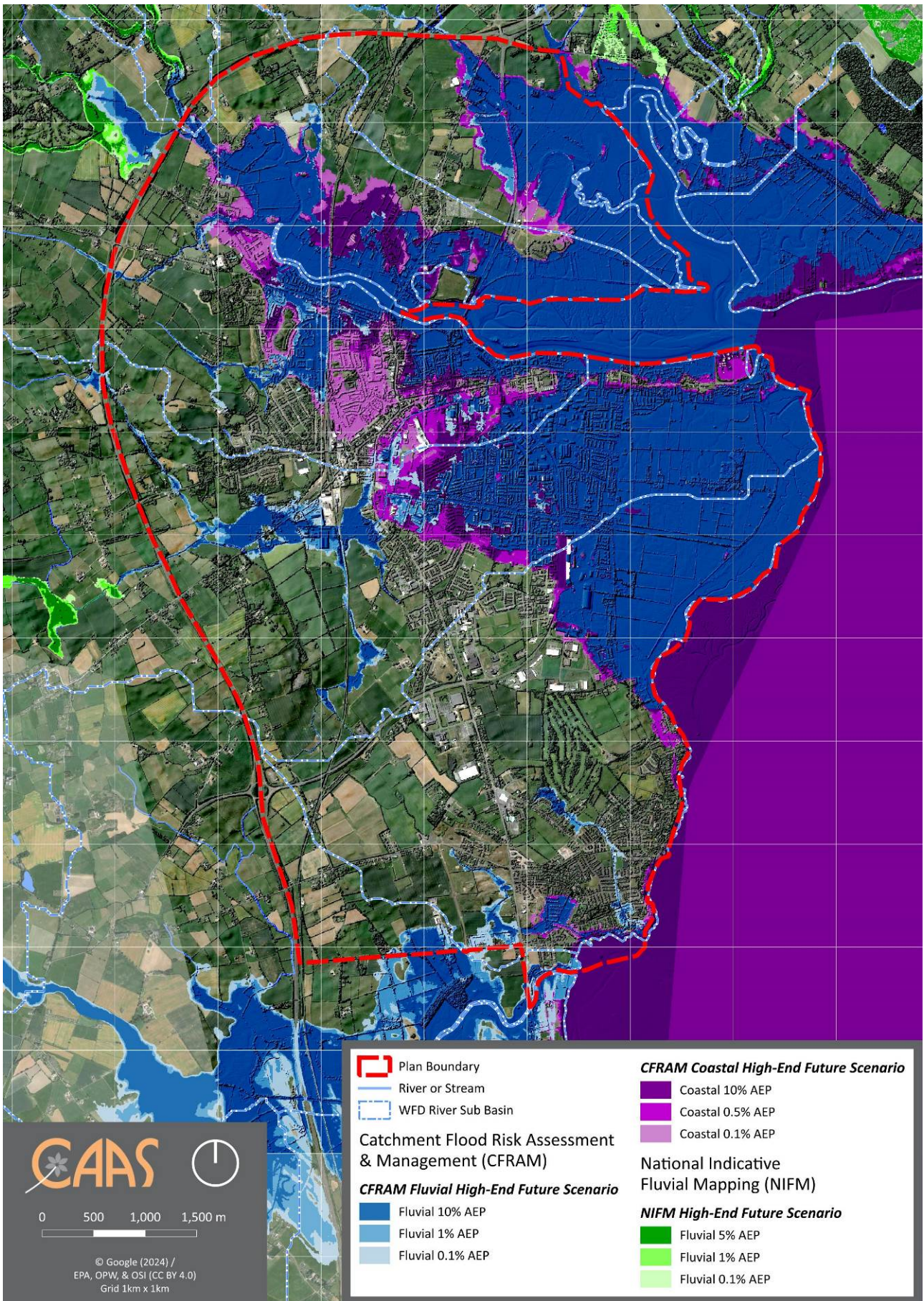
**Topography**



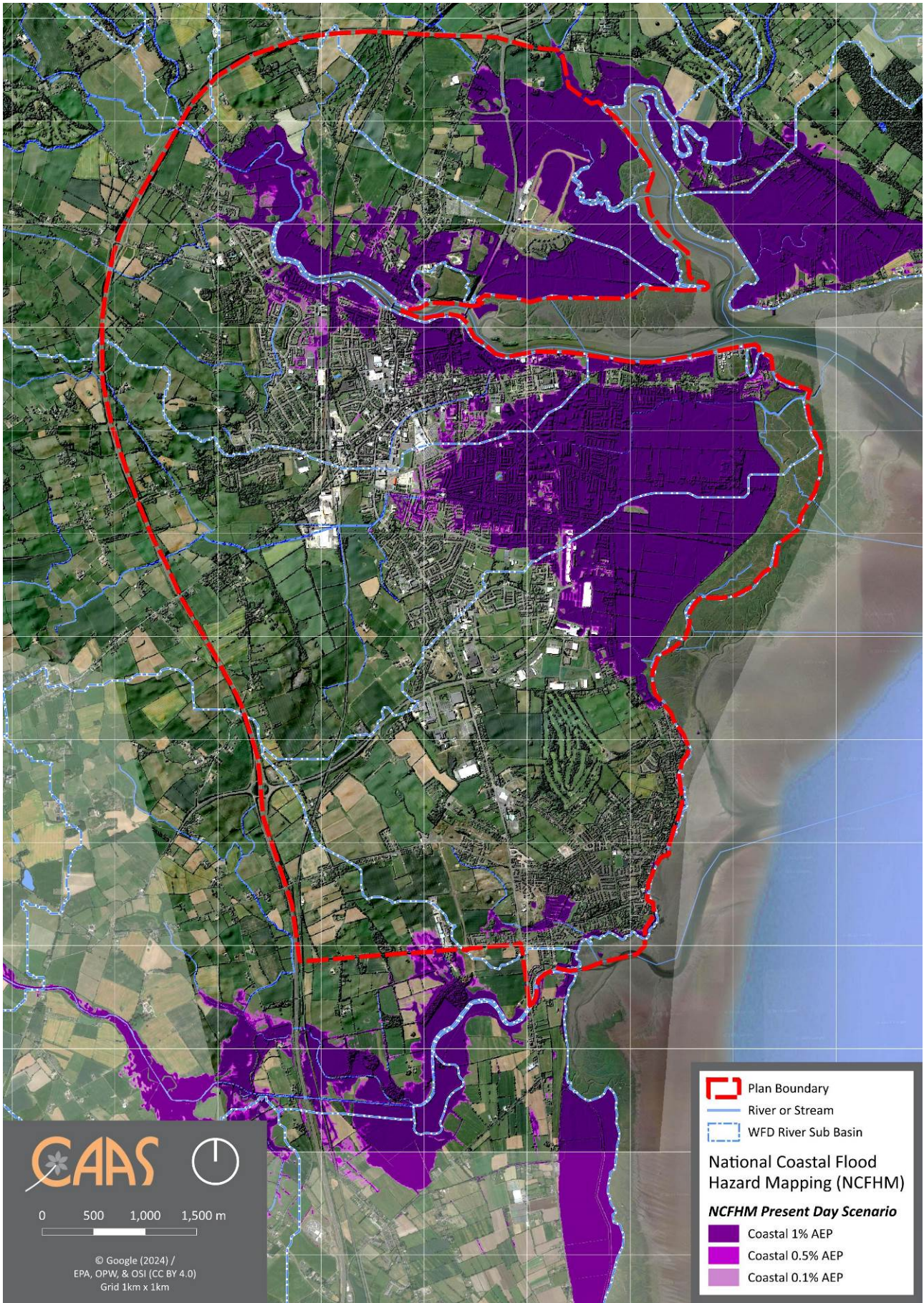
**NIFM and CFRAMS Present Day**



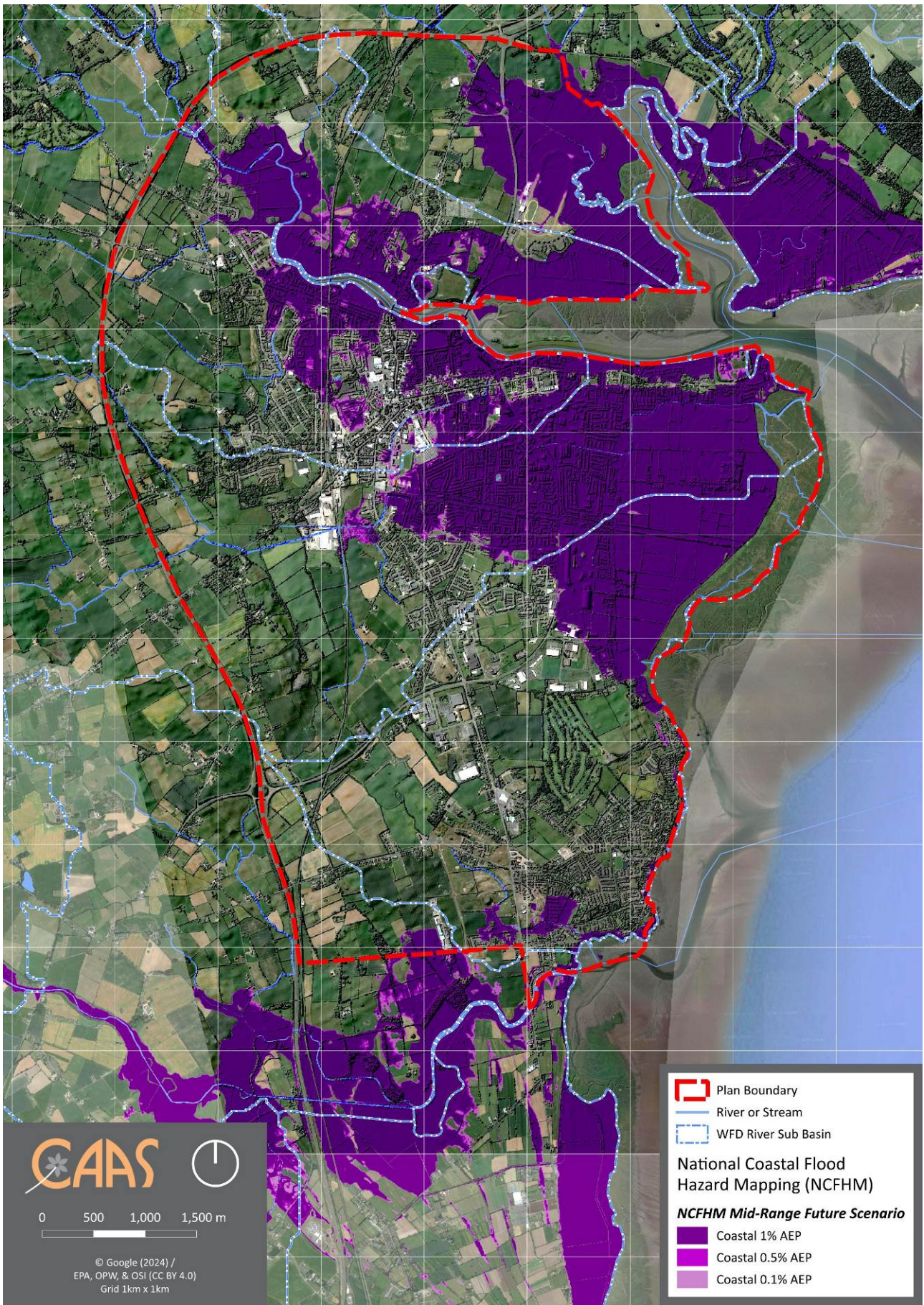
**NIFM and CFRAMS Mid-Range**



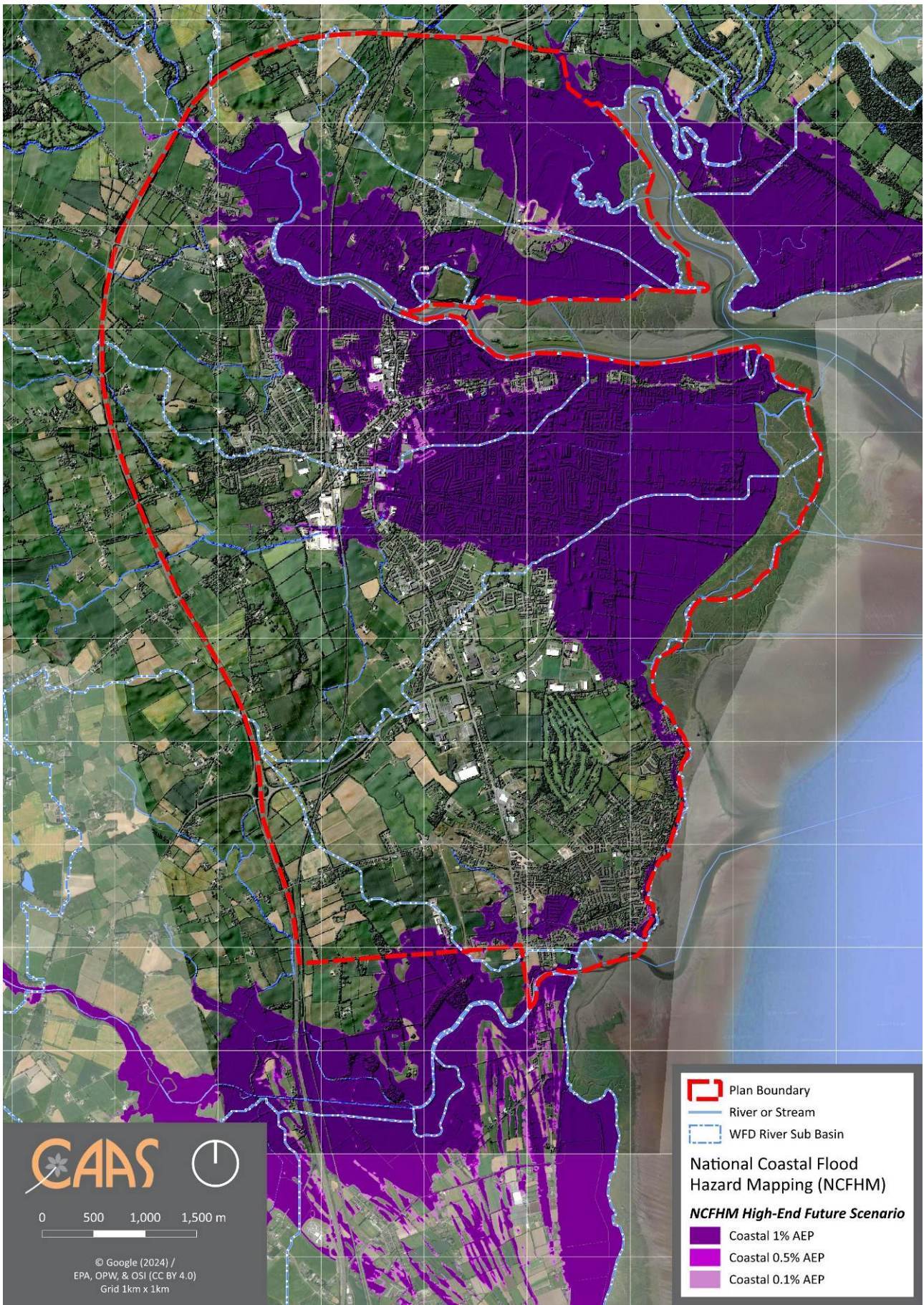
**NIFM and CFRAMS High End**



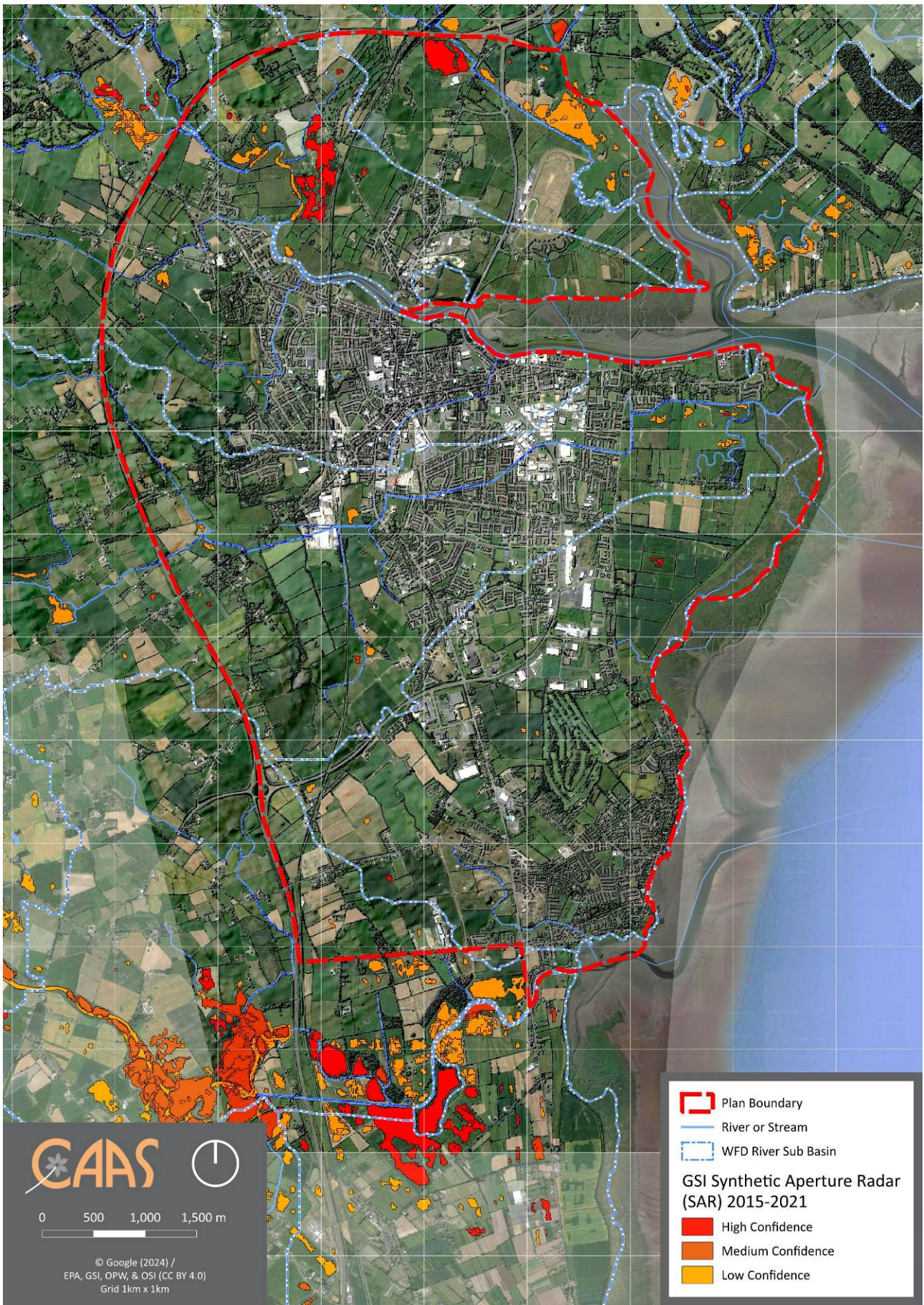
NCFHM Present Day



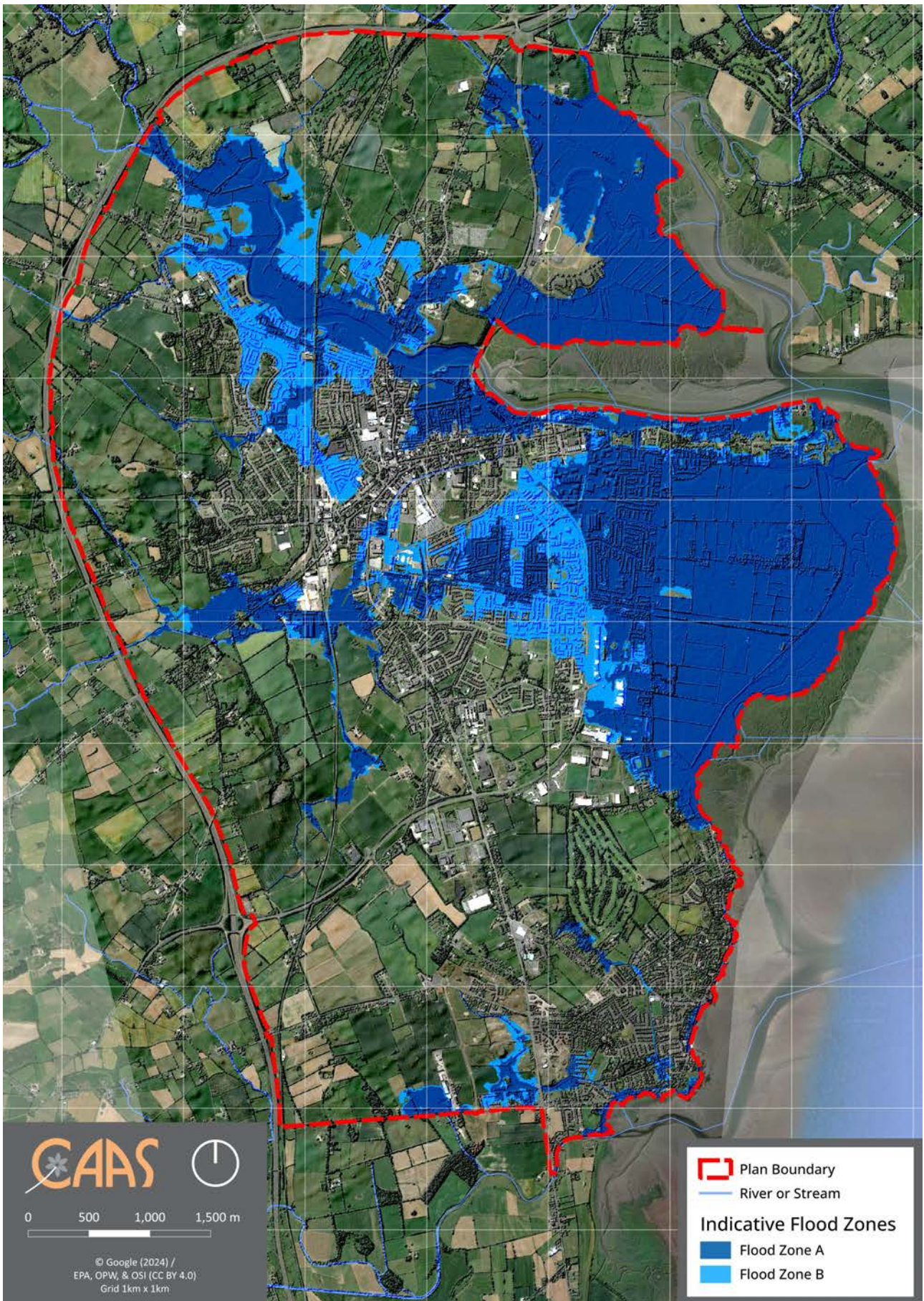
NCFHM Mid-Range



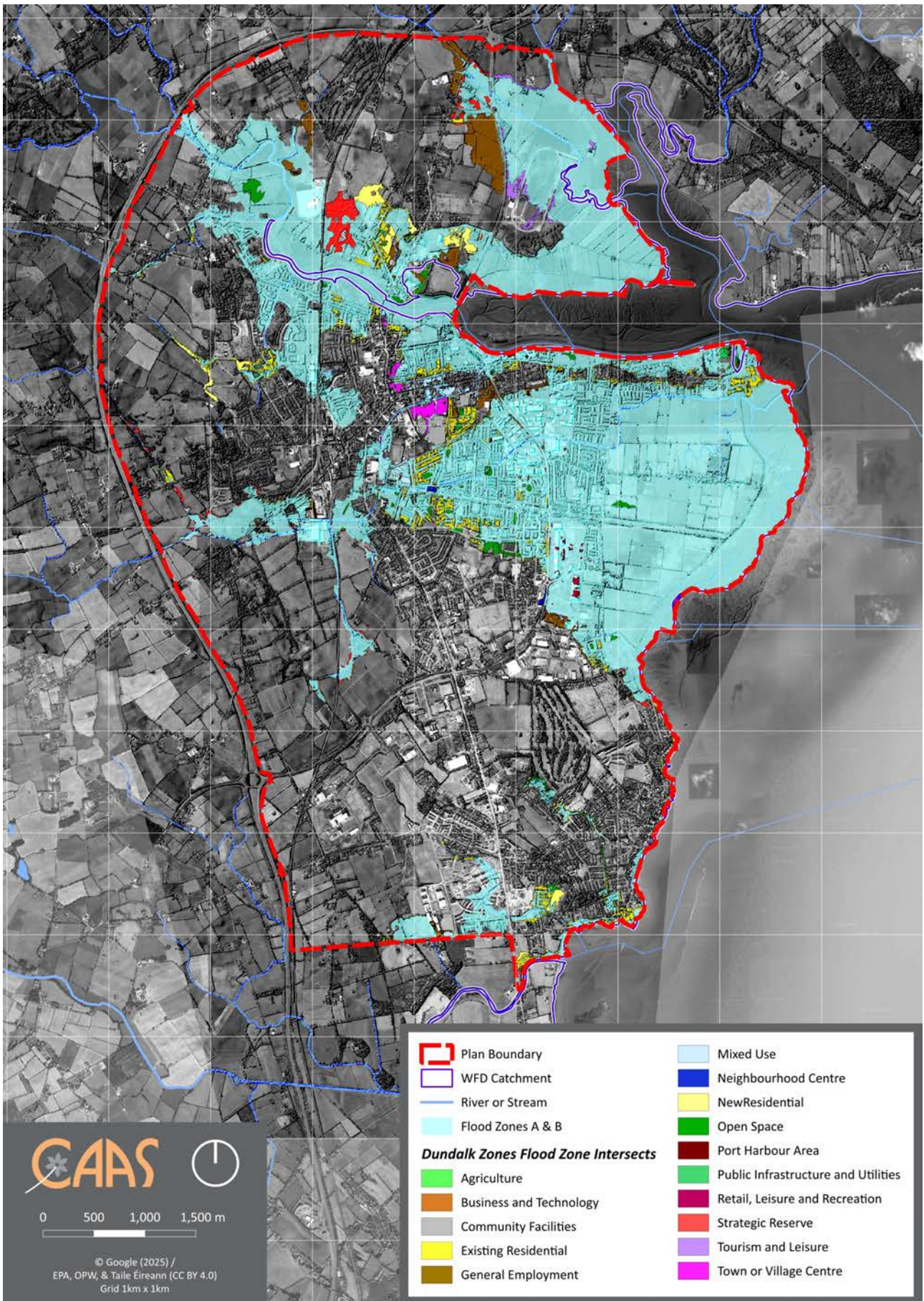
**NCFHM High End**



**Predictive Groundwater Flood Mapping**

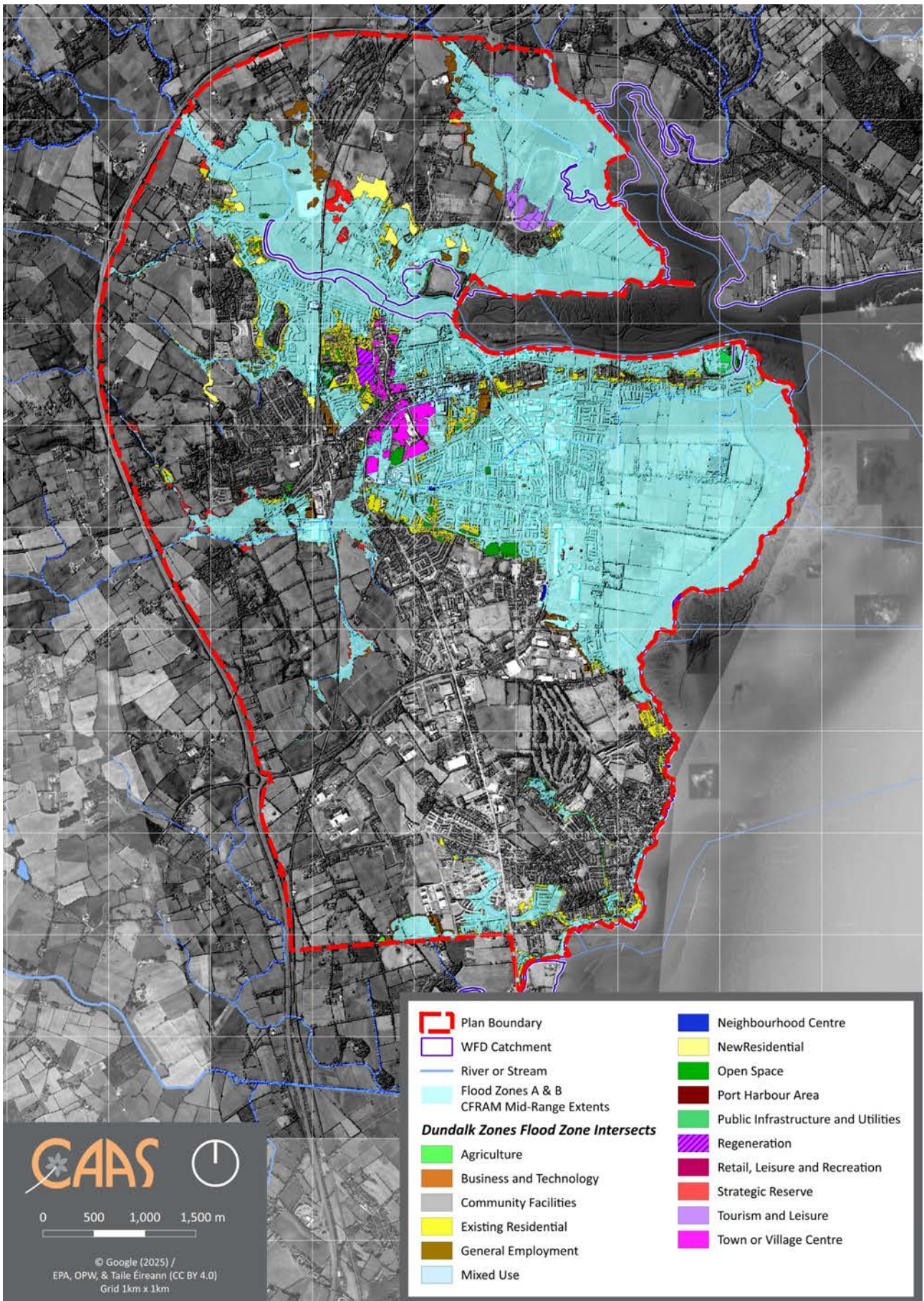


**Flood Zones A and B**



**Flood Risk Overlaps with Land Use Zoning – Mid Range Future Climate Scenario<sup>25</sup>**

<sup>25</sup> This map shows the combined Present Day Flood Zones A and B in light blue and the various land use zonings in areas adjacent to the combined Present Day Flood Zones A and B that are additionally identified as being at elevated risk under the Mid-Range Future Climate Scenario Mapping.



### Flood Risk Overlaps with Land Use Zoning – High End Future Climate Scenario<sup>26</sup>

<sup>26</sup> This map shows the combined Mid-Range Future Climate Scenario Mapping of Flood Zones A and B in light blue and the various land use zonings in areas adjacent to the combined Mid-Range Future Climate Scenario Mapping of Flood Zones A and B that are additionally identified as being at elevated risk under the High-End Future Climate Scenario Mapping.