

APPENDIX II TO THE SEA ENVIRONMENTAL REPORT

STAGE 2 STRATEGIC FLOOD RISK ASSESSMENT

FOR
PROPOSED AMENDMENT
TO THE
**GAELTACHT LOCAL AREA PLAN
2008-2014**

for: Galway County Council

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Table of Contents

List of Figures	iii
Section 1 Introduction and Policy Background	4
1.1 Introduction and Terms of Reference	4
1.2 Flood Risk Management Policy	4
1.2.1 EU Floods Directive	4
1.2.2 National Flood Policy	4
1.2.3 National CFRAM Programme	5
1.2.4 DEHLG and OPW Flood Risk Management Guidelines.....	5
1.2.4.1 Introduction.....	5
1.2.4.2 Principles of Flood Risk Management	6
1.2.4.3 Stages of SFRA	6
1.2.4.4 Flood Zones	6
1.3 Content of the Proposed Amendment	7
Section 2 Stage 1 SFRA - Flood Risk Identification in An Cheathrú Rua	10
2.1 Introduction.....	10
2.2 Data Considered.....	10
2.3 Summary of Limitations of Data Used	12
2.4 Conclusion	14
Section 3 Stage 2 SFRA - Initial Flood Risk Assessment in An Cheathrú Rua	15
3.1 Introduction.....	15
3.2 Site Walkovers	15
3.3 Flood Risk Indicator Information Considered	15
3.4 Site Walkover Findings and Adequacy of Existing Information	15
3.5 Indicative Flood Risk Zone Maps.....	17
Section 4 Stage 1 SFRA - Flood Risk Identification in An Spidéal	21
4.1 Introduction.....	21
4.2 Data Considered.....	21
4.3 Summary of Limitations of Data Used	23
4.4 Conclusion	25
Section 5 Stage 2 SFRA - Initial Flood Risk Assessment in An Spidéal	26
5.1 Introduction.....	26
5.2 Site Walkovers	26
5.3 Flood Risk Indicator Information Considered	26
5.4 Site Walkover Findings and Adequacy of Existing Information	26
5.5 Indicative Flood Risk Zone Maps.....	28
5.6 Information submitted by landowner	29
Section 6 Recommendations and Mitigation	33

List of Figures

Figure 1 Gaeltacht Districts covered by the LAP	8
Figure 2 Flood Risk Indicators for An Cheathrú Rua (including one groundtruthing locations from Section 3).....	13
Figure 3 Specific Groundtruthing Locations in An Cheathrú Rua.....	18
Figure 4 Indicative Flood Risk Zone Map for An Cheathrú Rua.....	19
Figure 5 Pluvial PFRA Mapping for An Cheathrú Rua	20
Figure 6 Flood Risk Indicators for An Spidéal (including two groundtruthing locations from Section 5) ...	24
Figure 7 Specific Groundtruthing Locations in An Spidéal	30
Figure 8 Indicative Flood Risk Zone Map for An Spidéal	31
Figure 9 Pluvial PFRA Mapping for An Spidéal.....	32
Figure 10 Sequential Approach Process.....	37
Figure 11 Justification Test	40

Section 1 Introduction and Policy Background

1.1 Introduction and Terms of Reference

This document presents the results of the findings of the Strategic Flood Risk Assessment (SFRA) which was undertaken alongside the preparation of the Proposed Amendment to the Gaeltacht Local Area Plan (LAP) and Material Alterations. The SFRA has been undertaken and prepared in accordance with 2009 *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* Department of the Environment, Heritage and Local Government and Office of Public Works (see Section 1.2.4).

The SFRA is an assessment of flood risk within and adjacent the zoned areas of the Gaeltacht LAP (the settlements of An Cheathrú Rua and An Spidéal).

1.2 Flood Risk Management Policy

1.2.1 EU Floods Directive

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 December 2011 in order to identify the river basins and associated coastal areas where potential significant flood risk exists.
- Prepare flood hazard and risk maps for the identified areas by December 2013.
- Prepare flood risk management plans focused on prevention, protection and preparedness by December 2015. These plans are to include measures to reduce the probability of flooding and its potential consequences.

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

1.2.2 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 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 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.

1.2.3 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 is being implemented through CFRAM studies which are being undertaken for each of the six river basin districts in Ireland.

The Programme comprises three phases as follows:

- The Preliminary Flood Risk Assessment (PFRA) in 2011;
- The CFRAM Studies and parallel activities, from 2011 to 2015; and
- Implementation and Review from 2016 onwards.

The Programme provides for three main consultative stages as follows:

- PFRAs in 2011;
- Flood Hazard Mapping, in 2013; and
- Flood Risk Management Plans in 2015.

The Office of Public Works 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 which includes requirements to prepare a preliminary assessment by 2011, flood risk mapping by 2013 and flood risk management plans by 2015. It is the principal agency involved in the preparation of Flood Risk Assessment and Management studies (FRAMs).

The PFRAs identified areas at risk of significant flooding and includes maps showing areas deemed to be at risk. The areas deemed to be at significant risk, where the flood risk that is of particular concern nationally, are identified as Areas for Further Assessment (AFAs) and more detailed assessment on the extent and degree of flood risk will be required in these areas.

1.2.4 DEHLG and OPW Flood Risk Management Guidelines

1.2.4.1 Introduction

In 2009, the DEHLG and OPW 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.

1.2.4.2 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 which 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 which have lower flood risk. Most types of development would be considered inappropriate in areas which 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.

1.2.4.3 Stages of SFRA

The 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 planning guidelines, 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 indicative 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 should be scoped; and

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.

1.2.4.4 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, presence and reliability of mitigation measures etc.).

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 or levels 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 areas of the plan which are not in zones A or B.

1.3 Content of the Proposed Amendment

The existing Gaeltacht LAP 2008-2014¹ consists of a written statement and appendices which contain maps and development control guidelines and standards. The existing LAP includes sectoral objectives for each of the six Gaeltacht districts (see Figure 1) and specific policies and objectives (including those relating to land use zoning) for the settlements of An Cheathrú Rua and An Spidéal.

The Proposed Amendment will leave the existing Plan boundary and the boundaries of the An Spidéal and An Cheathrú Rua zoning areas unchanged.

It is not anticipated that the Proposed Amendment will provide for changes to zoning objectives that would increase the likelihood of development in the An Spidéal or An Cheathrú Rua zoned areas. The Proposed Amendment may include very minor adjustments to reflect existing land uses.

The zoning of 'Residential' areas will be changed in order to introduce the phasing of residential lands ('Residential Phase 1' and 'Residential Phase 2'). Undeveloped Residential Phase 1 lands will be prioritised for development over the lifetime of this plan period. The development of Undeveloped Residential Phase 2 lands is likely to be delayed or not occur within this plan period. The phasing that is detailed in the Proposed Amendment has had particular regard to the spatial peripherality of lands and other environmental considerations.

The Proposed Amendment addresses the components as outlined on Table 1 below.

¹ The current LAP 2009-2015 is available at:

<http://www.galway.ie/en/Services/Planning/DevelopmentPlans/LocalAreaPlans/AdoptedPlans/GaeltachtLocalAreaPlan/>

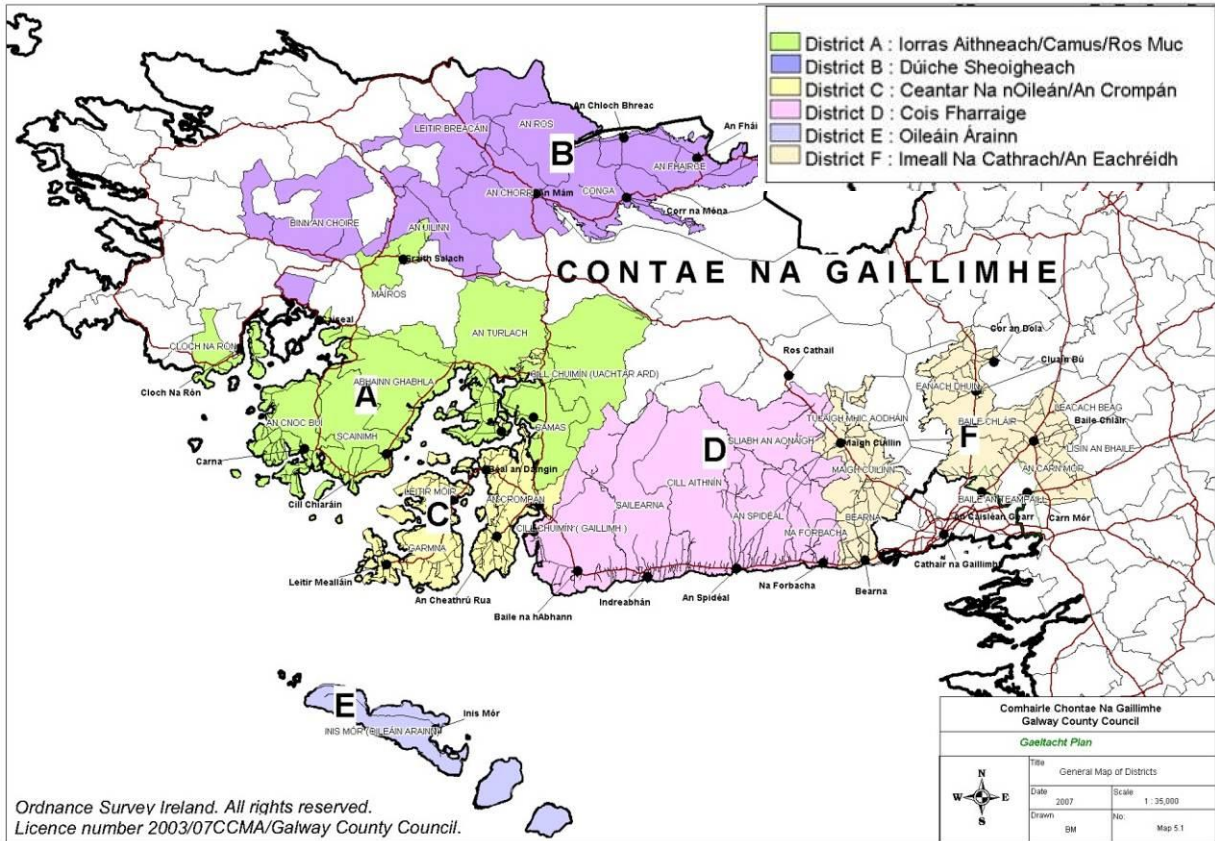


Figure 1 Gaeltacht Districts covered by the LAP

No.	Component	Summary
1	Consistency with the Galway County Development Plan and Core Strategy	<p>This includes updated references to development plan policies, objectives and standards and the phasing of zoned lands to comply with the population and zoned residential land allocation for An Spidéal and An Ceathrú Rua under the Core Strategy.</p> <ul style="list-style-type: none"> • An Spideal is allocated a population growth target of 25 persons by 2015, with a housing land requirement of 1.19 Hectares (with 50% over-zoning), under the Core Strategy. • An Ceathru Rua is allocated a population growth target of 105 persons by 2015 with a housing land requirement of 5.03 Hectares (with 50% over-zoning) under the Core Strategy. <p>Amendments include the phasing of lands within these settlements to ensure that the land use zonings and development areas in the Gaeltacht LAP comply with the provisions of the Core Strategy.</p>
2	Incorporation of flood risk assessment information and flood risk management measures to address the requirements of the Flood Risk Management Guidelines 2009 and inclusion of new objectives within the amended Plan	This includes the integration of recommendations arising from this Stage 2 SFRA.
3	Incorporation of additional measures to further protect designated environmental sites and address recommendations SEA and AA	It is also proposed to incorporate new and revised policies/objectives to further protect designated sites and the inclusion of any mitigation measures recommended in the SEA and AA of the amendments to the Plan to further address potential impacts on the environment and European Sites.
4	Addressing legislative, policy and data changes since the adoption of the Plan	<p>This includes updated references to the following: legislation, policy and guidelines published since the adoption of the Gaeltacht LAP 2008-2014; changes to departmental titles; population and land use data; etc.</p> <p>Amendments will be made in order to introduce the Core Strategy context and other legislation and policy requirements, and to other relevant sections of the Plan and to the Land Use Zoning Matrix.</p>
5	Amendments to Development Control Standards	Amendments will be made, where necessary, to Development Control Standards now titled Development Management Guidelines with the inclusion of new development management guidelines under the proposed amendments and to any other relevant sections of the Plan where appropriate.

Table 1 Contents of the Proposed Amendment

Section 2 Stage 1 SFRA - Flood Risk Identification in An Cheathrú Rua

2.1 Introduction

Stage 1 SFRA (flood risk identification) was undertaken for the zoned settlement of An Cheathrú Rua in order to identify whether there may be any flooding or surface water management issues within the settlement and consequently whether Stage 2 SFRA (initial flood risk assessment) should be proceeded to for the An Cheathrú Rua component of the Proposed Amendment.

2.2 Data Considered

The Stage 1 SFRA was a desk-based exercise based on existing information on flood risk indicators and involved consulting with a range of sources as detailed on Table 2 below. A map of the sources of flood risk indicators for An Cheathrú Rua is provided as Figure 2.

Information Source	Description	Is flood related information included for the LAP area?
The OPW Preliminary Flood Risk Assessment (PFRA) Fluvial, Coastal, Groundwater and Pluvial flood maps	<p>The Draft OPW Preliminary Flood Risk Assessment (PFRA) mapping dataset has been arrived at by:</p> <ul style="list-style-type: none"> • Reviewing records of floods that have happened in the past; • Undertaking analysis to determine which areas might flood in the future, and what the impacts might be; and • Extensive consultation with each local authorities and other Government departments and agencies. <p>This assessment has considered all types of flooding, including that which can occur from rivers, the sea and estuaries, heavy rain, groundwater, the failure of infrastructure, and so on. It has also considered the impacts flooding can have on people, property, businesses, the environment and cultural assets.</p>	Yes fluvial, coastal and pluvial areas present. No groundwater areas present.
National Coastal Protection Strategy Study flood and coastal erosion risk maps	<p>The predicted flood extents which were produced under the Irish Coastal Protection Strategy Study (ICPSS) are based on analysis and modelling. The project included:</p> <ul style="list-style-type: none"> • Analysis of historic recorded sea levels • Numerical modelling and statistical analysis of combined tide levels and storm surges to estimate extreme water levels along the national coastline for defined probabilities • Calculation of the extent of the predictive flooding, by comparing calculated extreme tide and surge waters levels along the coast with ground level based on a Digital Terrain Model (DTM). <p>These indicative national coastal flood maps are included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.</p>	Yes (Extents included as part of PFRA Coastal above)
Western CFRAM Flood Risk Review	<p>The Western CFRAM Flood Risk Review (JBA for OPW, May 2011) was undertaken to help validate the findings of the PFRA, informing decisions on which sites will be taken forward as Areas for Further Assessment for a more detailed assessment within the CFRAM Programme.</p>	Yes ² .

² This assessment identified that the scale of the problem in does not justify further assessment in the CFRAM.

Information Source	Description	Is flood related information included for the LAP area?
Data from OPW: Recorded Flood Events or Extents	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.). A flood extent is an inundated area as recorded at a certain moment in time.	No.
Data from OPW: Benefitting lands	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.	No.
Data from OPW: Drainage Districts	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.	No.
Data from OPW: Land Commission	This dataset indicates areas of land defended to some degree against flooding that were formerly the responsibility of the Land Commission.	No.
'Liable to flood' markings on the historic OSI '6 Inch' maps	<p>The Ordnance Survey of Ireland (OSI) 6" mapping identifies broad areas as being <i>Liable to Floods</i>. There are several limitations to the use of this mapping, such as the following:</p> <ul style="list-style-type: none"> • The OSI maps simply show the text Liable to Floods without delineating the extent of these areas. For the purposes of these draft maps a GIS system has been used to indicate the likely potential extent of these areas. • As these maps were based on survey work carried out from 1833-1844 with many updated in the 1930s and 40s, they do not show or take any account of recent changes including changes in surface drainage, such as development in floodplains, road realignments or drainage works for forestry or agriculture. So there is significant potential that flood risk in some areas may have increased or reduced since they were prepared. 	No.
River Basin Management Plans and reports	Implementation of the EU Floods Directive is required to be coordinated with the requirements of the EU Water Framework Directive and the current River Basin Management Plans.	No.
Previous Strategic Flood Risk Assessments	<p>For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The management of water resources will be on these river basin districts. The Gaeltacht area falls within the Western River Basin District (WRBD).</p> <p>Within each river basin district - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.</p> <p>The Local Authorities located in the WRBD - including Galway County Council - have prepared a River Basin Management Plan. The Plan identifies the status of water bodies within the RBD and provides objectives in order to implement the requirements of the WFD.</p>	Not applicable - no others have been prepared to date.
Regional Planning Guidelines for the West Region	The Regional Planning Guidelines for the West Region are accompanied by a Regional Flood Risk Appraisal which examines the relationship between the Draft Regional Planning Guidelines, flood risk in the West Region and the management of flood risk.	No.

Table 2 Information Sources Consulted with for the Identification of Flood Risk in An Cheathrú Rua

2.3 Summary of Limitations of Data Used

A summary of the general limitations of the flood risk indicators present within the LAP area are provided on Table 3 below.

Flood Risk Indicator	Summary of General Limitations
The OPW Preliminary Flood Risk Assessment (PFRA) Fluvial, Coastal and Pluvial flood maps	<p>The PFRA is only a preliminary assessment, based on available or readily derivable information. Analysis has been undertaken to identify areas prone to flooding, and the risks associated with such flooding, but this analysis is purely indicative and undertaken for the purpose of completing the draft PFRA. The mapping has been developed using simple and cost-effective methods and is based on broad-scale simple analysis and may not be accurate for a specific location/use.</p> <p>The prime source will ultimately be the flood zone maps produced by the OPW, but where these have not been prepared or are not on watercourses that will be covered by a CFRAM study then the planning body or developer will need to refer to alternative sources of information.</p> <p>Further information on the purpose, development and limitations of the OPW PFRA Maps are available in the available report (see www.cfram.ie)</p>

Table 3 Summary of Limitations of Data Used

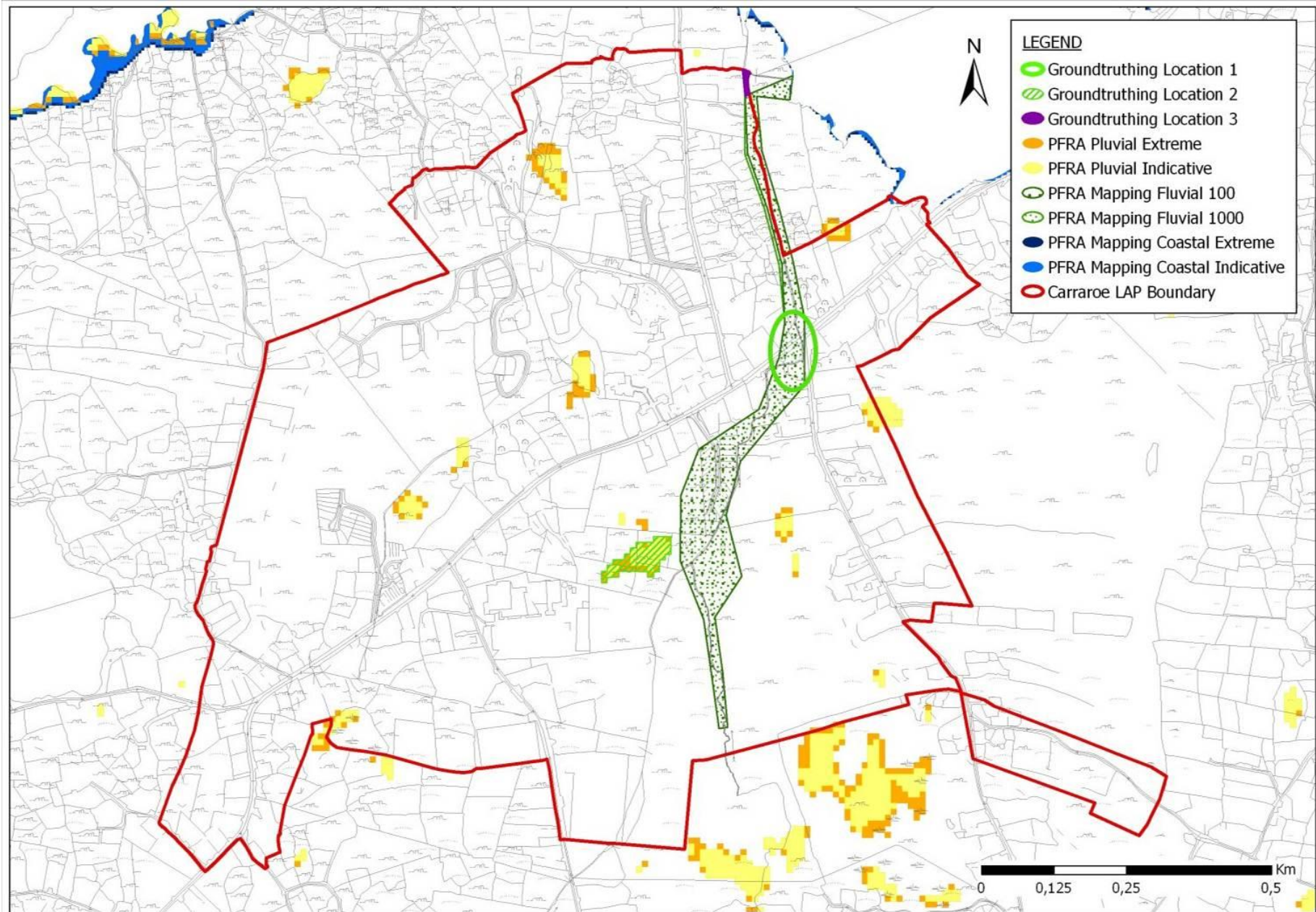


Figure 2 Flood Risk Indicators for An Cheathrú Rua (including one groundtruthing locations from Section 3)

2.4 Conclusion

After considering available information the planning authority considered that there was a potential flood risk issue and the SFRA proceeded to Stage 2 for An Cheathrú Rua.

Section 3 Stage 2 SFRA - Initial Flood Risk Assessment in An Cheathrú Rua

3.1 Introduction

A Stage 2 SFRA (initial flood risk assessment) was undertaken to

- Confirm the sources of flooding that may affect An Cheathrú Rua;
- 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 indicative flood zone maps.

3.2 Site Walkovers

In order to inform the Stage 2 assessment, the settlement and its zoned environs were inspected on foot to examine, inter alia, the potential source and direction of flood paths (including that from Loughaunwillan, the stream flowing into Loughaunwillan and tidal and storm surge from the coast), locations of topographic and built features that coincide with the flood indicator related boundaries and to identify standing water and vegetation indicative of standing water in the area.

3.3 Flood Risk Indicator Information Considered

Flood risk indicator information which was considered during the Stage 2 SFRA including the site walkovers included the following (this information is described in more detail under Section 2):

- OPW Preliminary Flood Risk Assessment (PFRA) Mapping:
 - Fluvial Indicative 100 and Fluvial Extreme 1000 mapping (Fluvial 1% and .1% Annual Exceedance Probabilities or AEPs);
 - Coastal Indicative and Coastal Extreme mapping (Coastal 0.5% and 0.1% AEPs); and
 - Pluvial Indicative and Pluvial Extreme mapping.
- Western CFRAM Flood Risk Review (JBA for OPW, May 2011).

3.4 Site Walkover Findings and Adequacy of Existing Information

The PFRA Fluvial and Coastal mapping was generally found to be consistent with what was observed on the ground during site walkovers and groundtruthing. While there are limitations associated with the PFRA maps, the Council is bound by the precautionary principle to use them as part of this Stage 2 SFRA unless evidence to the contrary is provided.

The Western CFRAM Flood Risk Review assessment identifies that the scale of the problem with regard to flooding in An Cheathrú Rua does not justify further assessment in the CFRAM. It confirms that properties are at risk where the watercourse passes through the centre of this village and identifies that properties have been built directly on the banks of the watercourse, constraining flow and putting properties at risk. The assessment identifies that channel has been straightened with severe angles, which may reduce the hydraulic capacity and increase flood risk.

Table 4 below details the findings of the groundtruthing at specific locations in An Cheathrú Rua (see map at Figure 3 for locations) and the SFRA recommendation in respect of these locations. Also detailed is how these recommendations have been integrated into the Amendments to the LAP.

No.	Location Description	Finding	Recommendation	Integration into the Amendments
1	Culvert of stream flowing into Loughaunwillan at intersection of Main Street and road going to Bothar an Chillin (PFRA Fluvial)	<p>The stream is culverted under the road and possibly buildings.</p> <p>Blockages at the culvert could cause a flooding event upstream.</p> <p>The catchment drained by the stream is very small.</p>	<p>It is important that flood risk is not increased here as a result of new developments.</p> <p>Zoning on relevant lands should be made compatible with Flood Zone A as appropriate.</p>	<p>Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity</p>
2	Ballyderry (PFRA Pluvial Area)	<p>Vegetation indicative of flooding/ standing water was observed to coincide with the PFRA Pluvial area at this location.</p>	<p>There are multiple indicators at these lands relating to flood risk. It is plausible that these lands could be developed.</p> <p>Applicants should be made aware of the risk and pointed towards provisions, including Objectives OFRM 1 & OFRC 1.</p>	<p>Applicants to be made aware of the risk and pointed towards provisions, including Objectives OFRM 1 & OFRC 1.</p>
3	Fluvial PFRA as it enters Loch An Mhuillin	<p>The PFRA Fluvial mapping does not reflect the course of the stream as it turns east and flows a distance of one field before it enters Loch An Mhuillin</p>	<p>There appears to be an anomaly in the PFRA mapping where the stream enters Loch An Mhuillin (see limitations on Table 3). This anomaly stretches inside and outside of the Plan area. It is recommended that the PFRA Fluvial 100 mapping is extended inside of the Plan area to reflect the pathway of the stream and that zoning at this location is made compatible with Flood Zone A as appropriate.</p>	<p>Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity</p>

Table 4 Findings and Recommendations at Specific Locations in An Cheathrú Rua

3.5 Indicative Flood Risk Zone Maps³

An Indicative Flood Risk Zone map was produced taking into account the findings of the groundtruthing and site walkovers. These are comprised as follows:

Indicative Flood Risk Zone A (Dark Blue) is a combination of:

- PFRA Fluvial Indicative 100 (Fluvial 1% Annual Exceedance Probability or AEP) mapping;
- PFRA Coastal Indicative (Coastal 0.5% AEP) mapping; and
- An area at CAAS Groundtruthing Location No. 3 to take account of the findings groundtruthing (see Figure 2, Figure 3 and Table 4).

Indicative Flood Risk Zone B (Light Blue) is a combination of Zone A plus:

- PFRA Fluvial Extreme 1000 (Fluvial .1% AEP) mapping; and
- PFRA Coastal Extreme (Coastal 0.1% AEP) mapping.

The Indicative Flood Risk Zone map is provided as Figure 4.

For pluvial flooding, the process for developing the pluvial flood extent maps (Flood Risk Assessment and Management Programme: National Pluvial Screening Project for Ireland – Rep EX6335/2.0, HR Wallingford, November 2010) was based on ‘dropping’ various depths and intensities of rainfall over a range of durations, and modelling how that rainfall would flow over the land and, in particular, pond in low-lying areas. The rainfall events (depth, duration and intensity) were derived from the rainfall analysis undertaken by Met Eireann on behalf of the OPW for the Flood Studies Update research programme. The amount of rainfall that was absorbed by the ground or, in urban areas, drained by the urban storm-water drainage system, and hence deducted from the water that would flow overland and pond, was estimated. It must be noted however that process assumed a constant capacity of urban storm-water drainage systems and generally did not taken into account local drainage structures such as culverts through embankments or other local drainage that would not be resolved in the model used for the mapping at a national scale. In addition to the above limitations, there are further intrinsic uncertainties associated with pluvial flooding and it can be influenced by, for example, blocked drains. Taking this into account, it is recommended the Council deal with pluvial risk through Plan policy or objective⁴. Taking this into account mapping of the following layers are presented separately (see Figure 5);

- PFRA Pluvial Indicative; and
- PFRA Pluvial Extreme.

³ 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. With regard to climate change flood extents these can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change.

⁴ Suggested provision: *Development proposals in areas where there is an identified or potential risk of flooding or that could give rise to a risk of flooding elsewhere will be required to carry out a Site-Specific Flood Risk Assessment, and justification test where appropriate, in accordance with the provisions of the Flood Risk Management Guidelines 2009 (or any superseding document). Any flood risk assessment should include an assessment of the potential impacts of climate change, such as an increase in the extent or probability of flooding, and any associated measures necessary to address these impacts.*

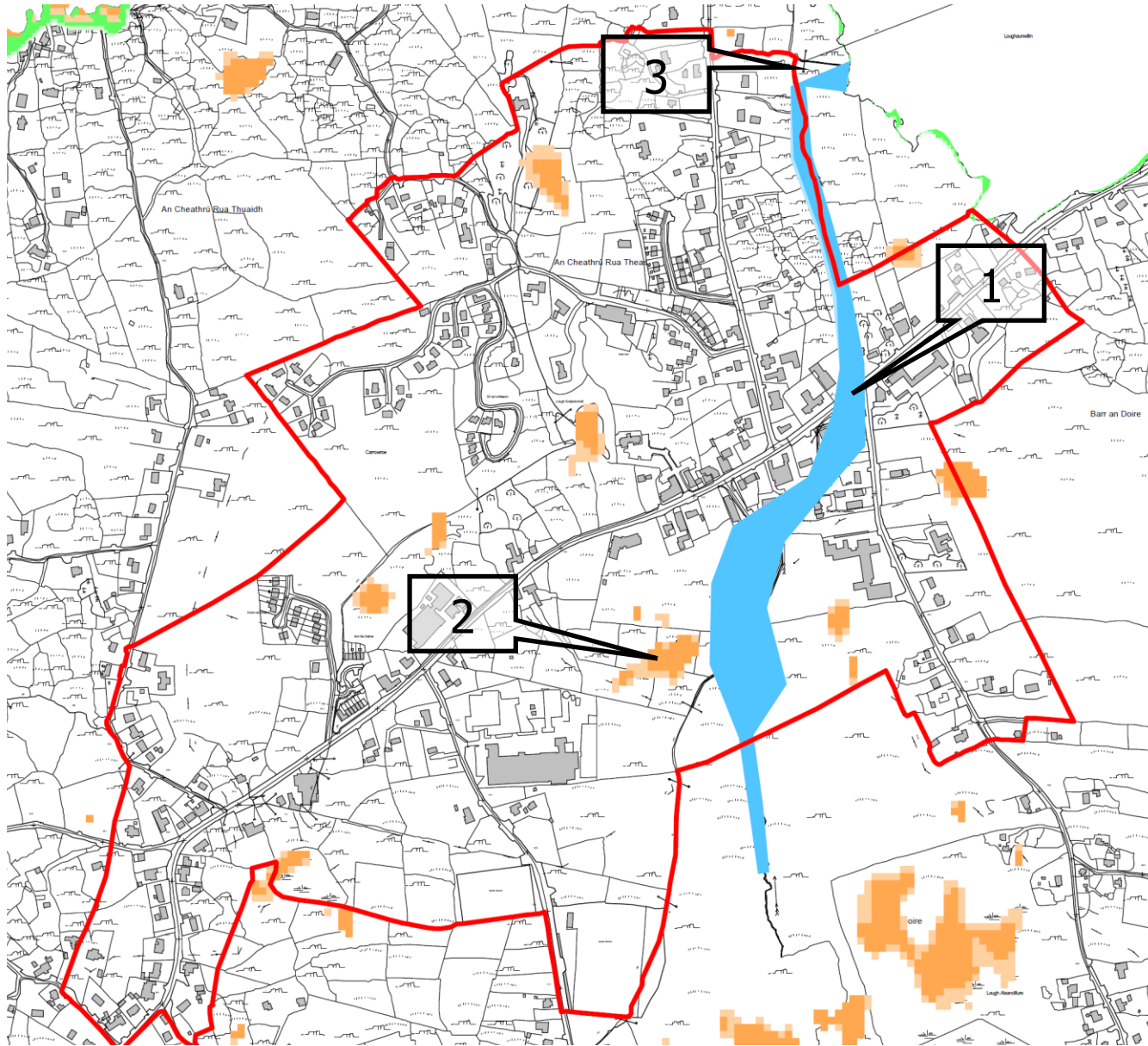


Figure 3 Specific Groundtruthing Locations in An Cheathrú Rua

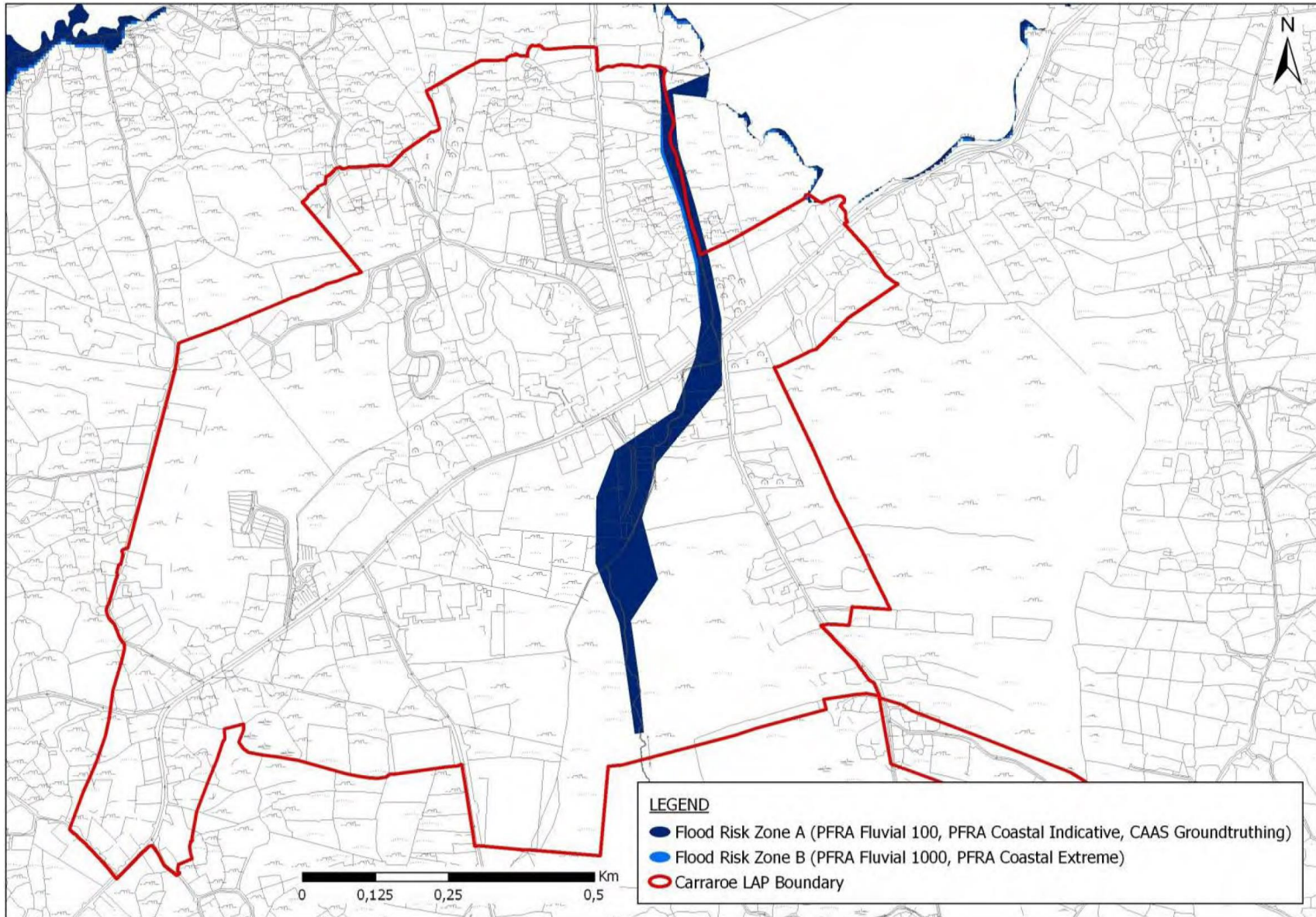


Figure 4 Indicative Flood Risk Zone Map for An Cheathrú Rua⁵

⁵ In addition to PFRA fluvial 100 (or 1% Annual Exceedance Probability areas) and PFRA Coastal Indicative mapping, one additional area was included within Indicative Zone A to take account of CAAS Groundtruthing at this location (see Figure 2, Figure 3 and Table 4).
CAAS for Galway County Council

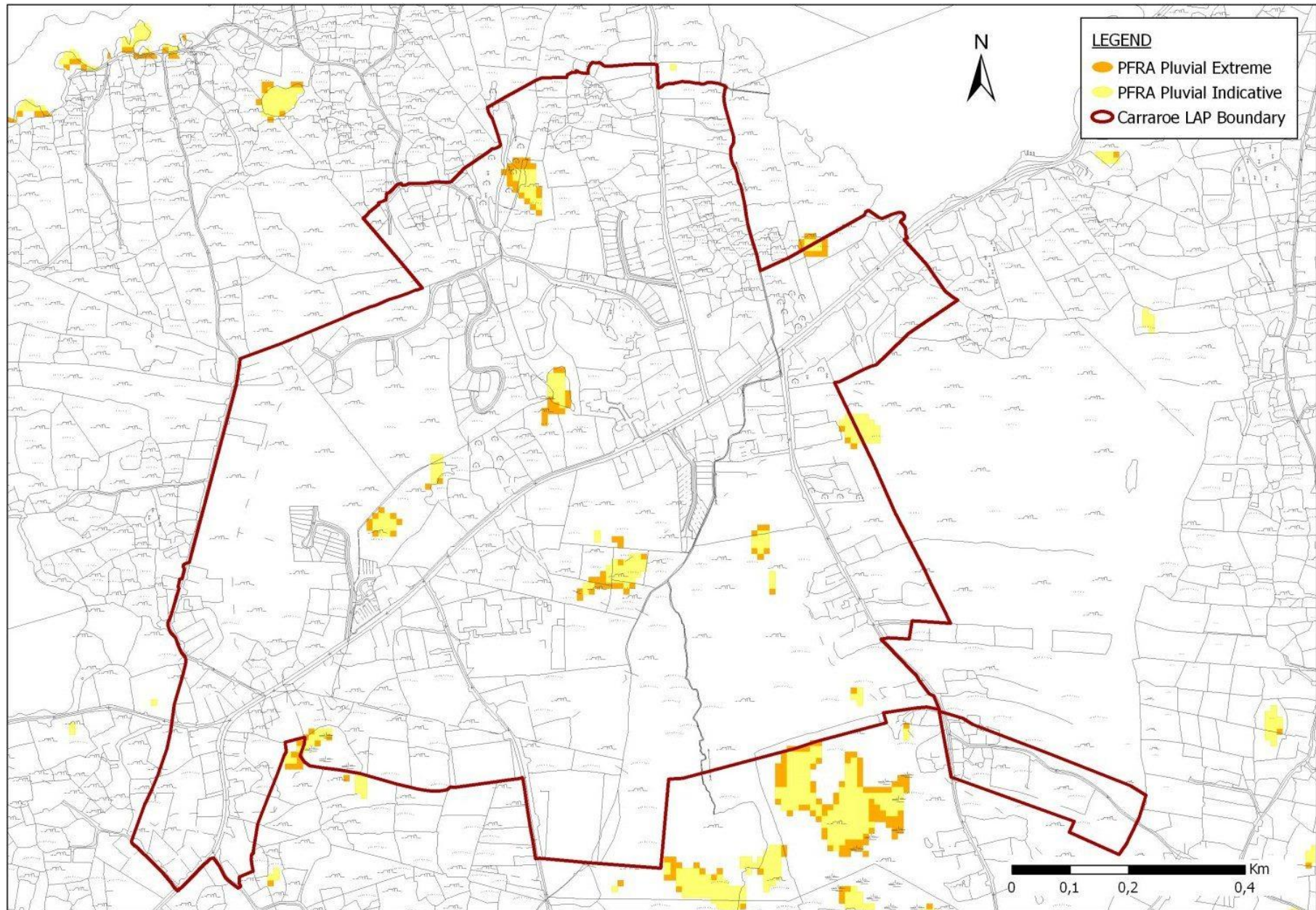


Figure 5 Pluvial PFRA Mapping for An Cheathrú Rua

Section 4 Stage 1 SFRA - Flood Risk Identification in An Spidéal

4.1 Introduction

Stage 1 SFRA (flood risk identification) was undertaken for the zoned settlement of An Spidéal in order to identify whether there may be any flooding or surface water management issues within the settlement and consequently whether Stage 2 SFRA (initial flood risk assessment) should be proceeded to for the An Spidéal component of the Proposed Amendment.

4.2 Data Considered

The Stage 1 SFRA was a desk-based exercise based on existing information on flood risk indicators and involved consulting with a range of sources as detailed on Table 5 below. A map of the sources of flood risk indicators for An Spidéal is provided as Figure 6.

Information Source	Description	Is flood related information included for the LAP area?
The OPW Preliminary Flood Risk Assessment (PFRA) Fluvial, Coastal, Groundwater and Pluvial flood maps	<p>The Draft OPW Preliminary Flood Risk Assessment (PFRA) mapping dataset has been arrived at by:</p> <ul style="list-style-type: none"> • Reviewing records of floods that have happened in the past; • Undertaking analysis to determine which areas might flood in the future, and what the impacts might be; and • Extensive consultation with each local authorities and other Government departments and agencies. <p>This assessment has considered all types of flooding, including that which can occur from rivers, the sea and estuaries, heavy rain, groundwater, the failure of infrastructure, and so on. It has also considered the impacts flooding can have on people, property, businesses, the environment and cultural assets.</p>	Yes fluvial, coastal and pluvial areas present. No groundwater areas present.
National Coastal Protection Strategy Study flood and coastal erosion risk maps	<p>The predicted flood extents which were produced under the Irish Coastal Protection Strategy Study (ICPSS) are based on analysis and modelling. The project included:</p> <ul style="list-style-type: none"> • Analysis of historic recorded sea levels • Numerical modelling and statistical analysis of combined tide levels and storm surges to estimate extreme water levels along the national coastline for defined probabilities • Calculation of the extent of the predictive flooding, by comparing calculated extreme tide and surge waters levels along the coast with ground level based on a Digital Terrain Model (DTM). <p>These indicative national coastal flood maps are included in the Draft PFRA Maps, provided in a separate volume, for the purposes of consultation on the PFRA.</p>	Yes (Extents included as part of PFRA Coastal above)
Western CFRAM Flood Risk Review	<p>The Western CFRAM Flood Risk Review (JBA for OPW, May 2011) was undertaken to help validate the findings of the PFRA, informing decisions on which sites will be taken forward as Areas for Further Assessment for a more detailed assessment within the CFRAM Programme.</p>	Yes ⁶ .

⁶ This assessment identified that due to the low number of properties at risk, this site should remain as a risk review location i.e. unless further supporting information is identified it will not be taken forward in the CFRAM.

Information Source	Description	Is flood related information included for the LAP area?
Data from OPW: Recorded Flood Events or Extents	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.). A flood extent is an inundated area as recorded at a certain moment in time.	Yes, flood event.
Data from OPW: Benefitting lands	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.	No.
Data from OPW: Drainage Districts	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.	No.
Data from OPW: Land Commission	This dataset indicates areas of land defended to some degree against flooding that were formerly the responsibility of the Land Commission.	No.
'Liable to flood' markings on the historic OSI '6 Inch' maps	<p>The Ordnance Survey of Ireland (OSI) 6" mapping identifies broad areas as being <i>Liable to Floods</i>. There are several limitations to the use of this mapping, such as the following:</p> <ul style="list-style-type: none"> • The OSI maps simply show the text Liable to Floods without delineating the extent of these areas. For the purposes of these draft maps a GIS system has been used to indicate the likely potential extent of these areas. • As these maps were based on survey work carried out from 1833-1844 with many updated in the 1930s and 40s, they do not show or take any account of recent changes including changes in surface drainage, such as development in floodplains, road realignments or drainage works for forestry or agriculture. So there is significant potential that flood risk in some areas may have increased or reduced since they were prepared. 	No.
River Basin Management Plans and reports	Implementation of the EU Floods Directive is required to be coordinated with the requirements of the EU Water Framework Directive and the current River Basin Management Plans.	No.
Previous Strategic Flood Risk Assessments	<p>For the purpose of implementing the WFD, Ireland has been divided into eight river basin districts or areas of land that are drained by a large river or number of rivers and the adjacent estuarine / coastal areas. The management of water resources will be on these river basin districts. The Gaeltacht area falls within the Western River Basin District (WRBD).</p> <p>Within each river basin district - for the purpose of assessment, reporting and management - water has been divided into groundwater, rivers, lakes, estuarine waters and coastal waters which are in turn divided into specific, clearly defined water bodies.</p> <p>The Local Authorities located in the WRBD - including Galway County Council - have prepared a River Basin Management Plan. The Plan identifies the status of water bodies within the RBD and provides objectives in order to implement the requirements of the WFD.</p>	Not applicable - no others have been prepared to date.
Regional Planning Guidelines for the West Region	The Regional Planning Guidelines for the West Region are accompanied by a Regional Flood Risk Appraisal which examines the relationship between the Draft Regional Planning Guidelines, flood risk in the West Region and the management of flood risk.	No.

Table 5 Information Sources Consulted with for the Identification of Flood Risk in An Spidéal

4.3 Summary of Limitations of Data Used

A summary of the general limitations of the flood risk indicators present within the LAP area are provided on Table 6 below.

Flood Risk Indicator	Summary of General Limitations
The OPW Preliminary Flood Risk Assessment (PFRA) Fluvial, Coastal and Pluvial flood maps	<p>The PFRA is only a preliminary assessment, based on available or readily derivable information. Analysis has been undertaken to identify areas prone to flooding, and the risks associated with such flooding, but this analysis is purely indicative and undertaken for the purpose of completing the draft PFRA. The mapping has been developed using simple and cost-effective methods and is based on broad-scale simple analysis and may not be accurate for a specific location/use.</p> <p>The prime source will ultimately be the flood zone maps produced by the OPW, but where these have not been prepared or are not on watercourses that will be covered by a CFRAM study then the planning body or developer will need to refer to alternative sources of information.</p> <p>Further information on the purpose, development and limitations of the OPW PFRA Maps are available in the available report (see www.cfram.ie)</p>

Table 6 Summary of Limitations of Data Used

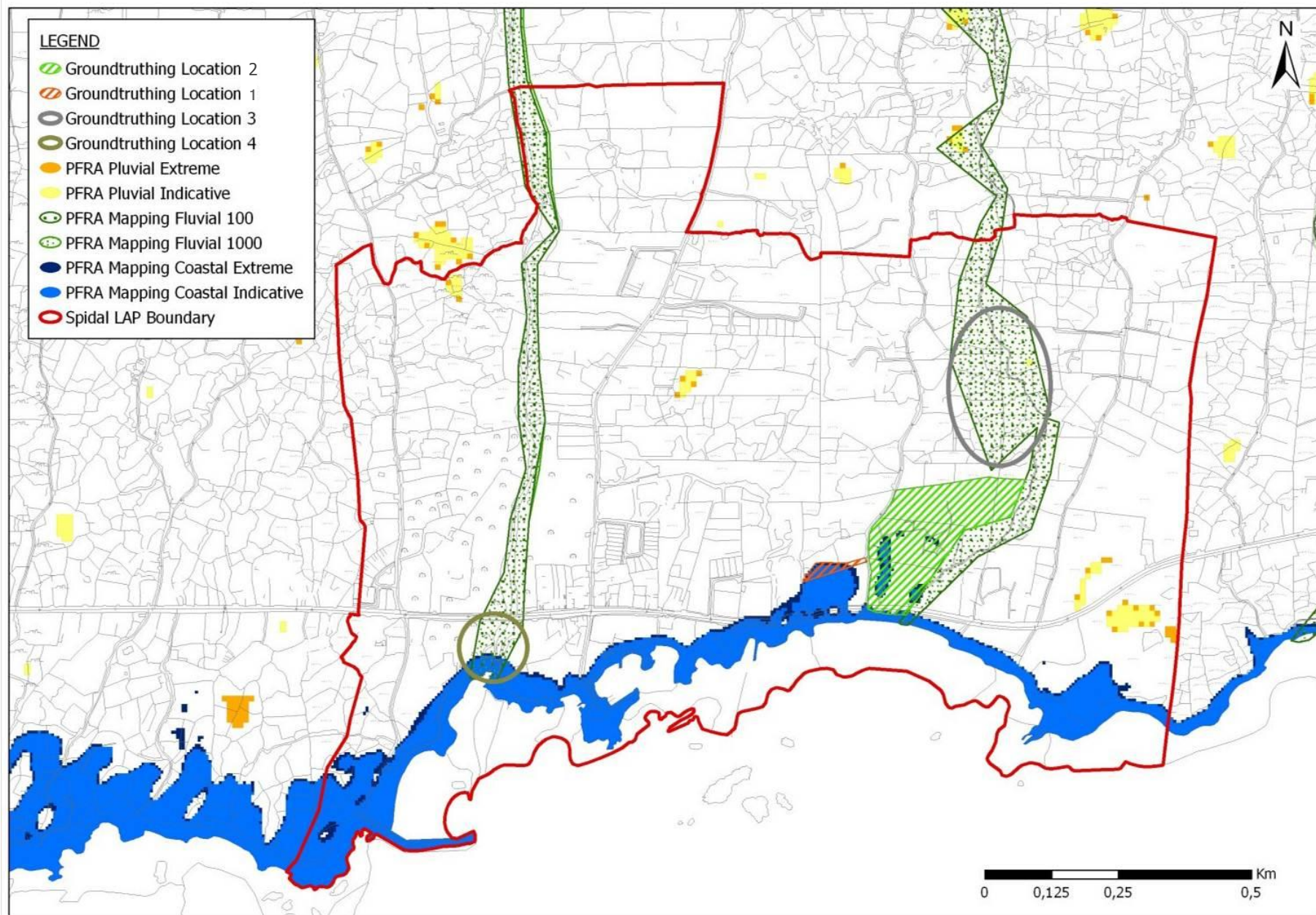


Figure 6 Flood Risk Indicators for An Spidéal (including two groundtruthing locations from Section 5)

4.4 Conclusion

After considering available information the planning authority considered that there was a potential flood risk issue and the SFRA proceeded to Stage 2 for An Spidéal.

Section 5 Stage 2 SFRA - Initial Flood Risk Assessment in An Spidéal

5.1 Introduction

A Stage 2 SFRA (initial flood risk assessment) was undertaken to

- Confirm the sources of flooding that may affect An Spidéal;
- 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 indicative flood zone maps.

5.2 Site Walkovers

In order to inform the Stage 2 assessment, the settlement and its zoned environs were inspected on foot to examine, inter alia, the potential source and direction of flood paths (including that from the Owenboliska River, from the An Spidéal River and from tidal and storm surge from the coast), locations of topographic and built features that coincide with the flood indicator related boundaries and to identify standing water and vegetation (including reeds) indicative of standing water in the area.

5.3 Flood Risk Indicator Information Considered

Flood risk indicator information which was considered during the Stage 2 SFRA including the site walkovers included the following (this information is described in more detail under Section 2):

- OPW Preliminary Flood Risk Assessment (PFRA) Mapping:
 - Fluvial Indicative 100 and Fluvial Extreme 1000 mapping (Fluvial 1% and .1% Annual Exceedance Probabilities or AEPs);
 - Coastal Indicative and Coastal Extreme mapping (Coastal 0.5% and 0.1% AEPs); and
 - Pluvial Indicative and Pluvial Extreme mapping.
- Western CFRAM Flood Risk Review (JBA for OPW, May 2011).

5.4 Site Walkover Findings and Adequacy of Existing Information

The PFRA Fluvial and Coastal mapping was generally found to be consistent with what was observed on the ground during site walkovers and groundtruthing. While there are limitations associated with the PFRA maps, the Council is bound by the precautionary principle to use them as part of this Stage 2 SFRA unless evidence to the contrary is provided.

Due to the size and steepness of the catchments of the rivers in the An Spidéal area, there is a significant risk of flash flooding from the uplands. The risk arising from flash flooding is increased at culverts such as those along the R336.

The Western CFRAM Flood Risk Review assessment identifies that due to the low number of properties at risk, this site should remain as a risk review location i.e. unless further supporting information is identified it will not be taken forward in the CFRAM. The Flood Risk Review assessment identifies that in a severe flood event, the Owenboliska could potentially flood the surrounding roads and a few properties and that the PFRA extents for this watercourse represent flood risk sufficiently. The assessment also identifies that the An Spidéal area floods from a combination of high tides and strong winds every year. Road is liable to flood (tidal) as is a basement of a pub (fluvial). The only area of concern highlighted

during the site visit for the Flood Risk Review is the potential tidal and combined fluvial/tidal flood risk to two schools in An Spidéal.

Table 7 below details the findings of the groundtruthing at specific locations in An Spidéal (see map at Figure 7 for locations) and the SFRA recommendation in respect of these locations. Also detailed is how these recommendations have been integrated into the Amendments to the LAP.

No.	Location Description	Finding	Recommendation	Integration into the Amendments
1	Location 1: Lands to east of craft centre in east of town (Coastal PFRA)	These lands are at risk from: <ul style="list-style-type: none"> • Coastal; • Fluvial; and, • Pluvial flooding. • Vegetation (reeds, rushes and flag iris) indicative of standing water and flooding were observed. 	It is recommended that the zoning of the lands covered by the PFRA mapping at Location 1 and other lands at Location 1 (as indicated on Figure 6) are made compatible with Flood Zone A as appropriate.	Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity
2	Location 2: Lands to east of 1 above	These lands are at risk from <ul style="list-style-type: none"> • Coastal (through culvert); • Fluvial; and • Pluvial flooding. • The PFRA Fluvial mapping covers one of the streams on these lands. • The An Spidéal River that affects this location drains a steep, sizable catchment and there is a significant risk of flash flooding from the uplands. 	It is recommended that the zoning of the lands covered by the PFRA mapping at Location 2 and other lands at Location 2 (as indicated on Figure 6) are made compatible with Flood Zone A as appropriate.	Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity
3	Location 3: Fluvial PFRA along An Spidéal River in the east of the town	The extent of the PFRA Fluvial mapping shown on the map does not reflect what was observed on the ground.	There may be an anomaly in the PFRA mapping (see limitations on Table 6) and developers should satisfy themselves with regard to the risk of flooding in advance of any new development at this location by complying with Plan policies and objectives. While there are limitations associated with the PFRA maps, the Council is bound by the precautionary principle to use them as part of	Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity

			this Stage 2 SFRA unless evidence to the contrary is provided. The zoning of these lands should be made compatible with Flood Zone A as appropriate.	
4	Location 4: Lands to the south of the road, in the west of the town	This location is at risk from fluvial and coastal flooding and is identified as being at risk by both PFRA Fluvial and Coastal mapping	It is recommended that the zoning of lands covered by the PFRA mapping are made compatible with Flood Zone A as appropriate.	Zoning of all undeveloped lands falling within the Flood zones A and B has been amended to Recreation and Amenity.

Table 7 Findings and Recommendations at Specific Locations in An Spidéal

5.5 Indicative Flood Risk Zone Maps⁷

An Indicative Flood Risk Zone map was produced taking into account the findings of the groundtruthing and site walkovers (as well as findings to take account of information submitted by landowners - see Section 5.6). These are comprised as follows:

Indicative Flood Risk Zone A (Dark Blue) is a combination of:

- PFRA Fluvial Indicative 100 (Fluvial 1% Annual Exceedance Probability or AEP) mapping;
- PFRA Coastal Indicative (Coastal 0.5% AEP) mapping; and
- Areas at CAAS Groundtruthing Locations No.'s 1 and 2 (see Figure 6, Figure 7 and Table 7).

Indicative Flood Risk Zone B (Light Blue) is a combination of Zone A plus:

- PFRA Fluvial Extreme 1000 (Fluvial .1% AEP) mapping; and
- PFRA Coastal Extreme (Coastal 0.1% AEP) mapping.

The Indicative Flood Risk Zone map is provided as Figure 8.

For pluvial flooding, the process for developing the pluvial flood extent maps (Flood Risk Assessment and Management Programme: National Pluvial Screening Project for Ireland – Rep EX6335/2.0, HR Wallingford, November 2010) was based on ‘dropping’ various depths and intensities of rainfall over a range of durations, and modelling how that rainfall would flow over the land and, in particular, pond in low-lying areas. The rainfall events (depth, duration and intensity) were derived from the rainfall analysis undertaken by Met Eireann on behalf of the OPW for the Flood Studies Update research programme. The amount of rainfall that was absorbed by the ground or, in urban areas, drained by the urban storm-water drainage system, and hence deducted from the water that would flow overland and pond, was estimated. It must be noted however that process assumed a constant capacity of urban storm-water drainage systems and generally did not taken into account local drainage structures such as culverts through embankments or other local drainage that would not be resolved in the model used for the mapping at a national scale. In addition to the above limitations, there are further intrinsic uncertainties associated with pluvial flooding and it can be influenced by, for example, blocked drains. Taking this into account, it

⁷ 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. With regard to climate change flood extents these can be assessed by using the Flood Zone B outline as a surrogate for Flood Zone A with allowance for the possible impacts of climate change.

is recommended the Council deal with pluvial risk through Plan policy or objective⁸. Taking this into account mapping of the following layers are presented separately (see Figure 9);

- PFRA Pluvial Indicative; and
- PFRA Pluvial Extreme.

5.6 Information submitted by landowner

Information was submitted by the landowner on Material Alteration No. 2 lands which resulted in the updating of the Flood Risk Zones contained in an earlier version of this document.

The landowner provided a site-specific FRA including revised Flood Risk Zone Mapping (Figure 8 in the FRA). The landowner also provided clarifying, additional information in relation to the site-specific FRA.

It appears from the documentation submitted that the site-specific FRA is complete and takes into account combined tidal and fluvial factors as well as contributing towards the taking into account of climate change.

Accordingly, the Flood Risk Zone map for An Spidéal in the Council's Stage 2 SFRA was updated in order to show Flood Risk Zones as per Figure 8 of the site-specific FRA.

The SFRA recommends that should the zoning of any Material Alteration No. 2 lands not be adopted as Recreation & Amenity, then the plan should provide for the notification of any future owner or developer that:

These lands have been zoned according to the information contained in a site-specific flood risk assessment provided by the landowner and that there is still potential for some of the lands to flood. Available data currently is imperfect and does not allow for the definitive quantification of this potential. This does not preclude development once the proposed site design for any proposed development shows that it does not displace flood water thereby exposing lands elsewhere to unacceptable levels of flood risk and satisfies the applicant and the Council that the development itself to will not be exposed to unacceptable levels of flood risk.

A note to this effect should also be attached to the zoning map.

⁸ Suggested provision: *Development proposals in areas where there is an identified or potential risk of flooding or that could give rise to a risk of flooding elsewhere will be required to carry out a Site-Specific Flood Risk Assessment, and justification test where appropriate, in accordance with the provisions of the Flood Risk Management Guidelines 2009 (or any superseding document). Any flood risk assessment should include an assessment of the potential impacts of climate change, such as an increase in the extent or probability of flooding, and any associated measures necessary to address these impacts.*

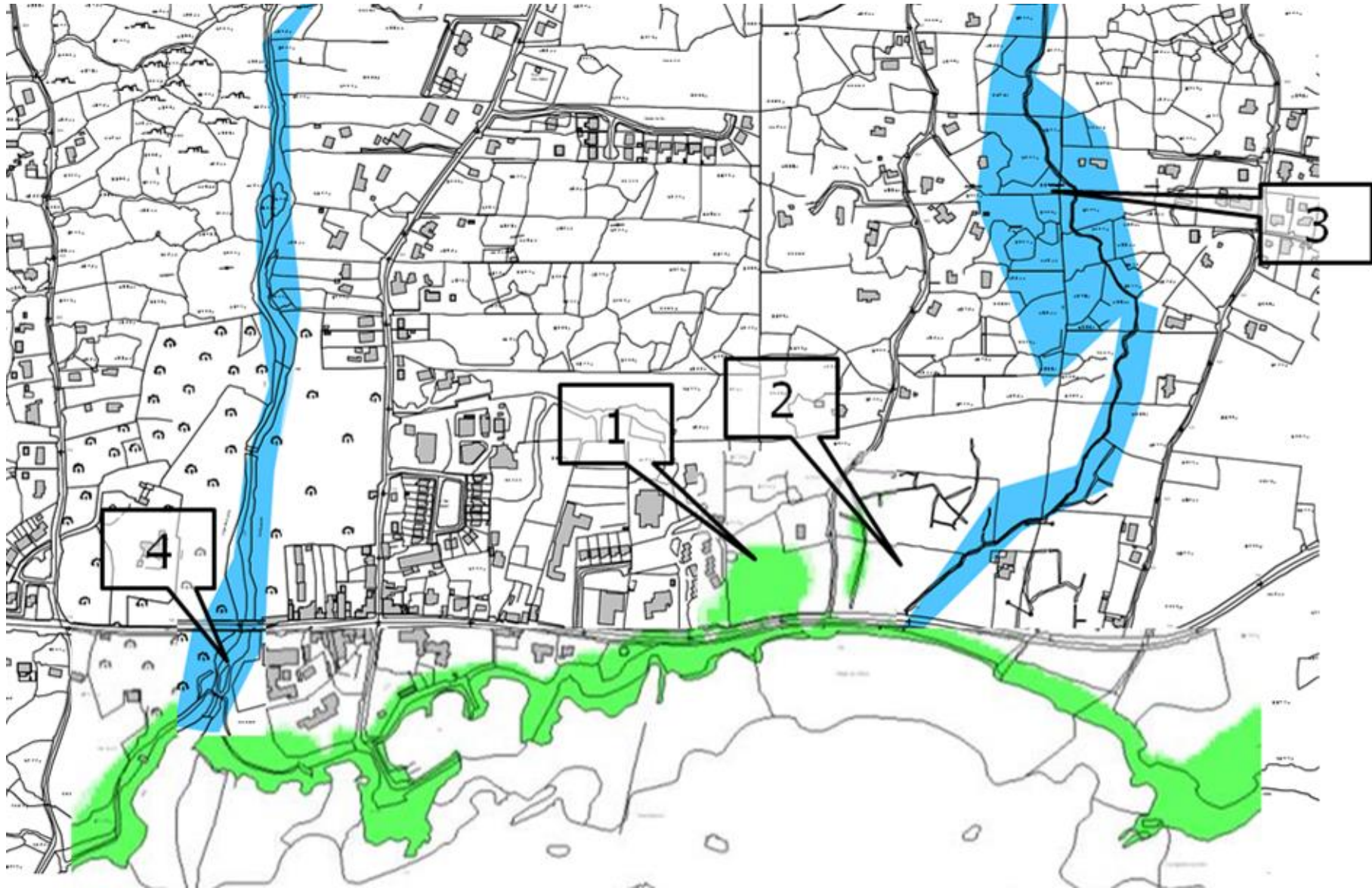


Figure 7 Specific Groundtruthing Locations in An Spidéal

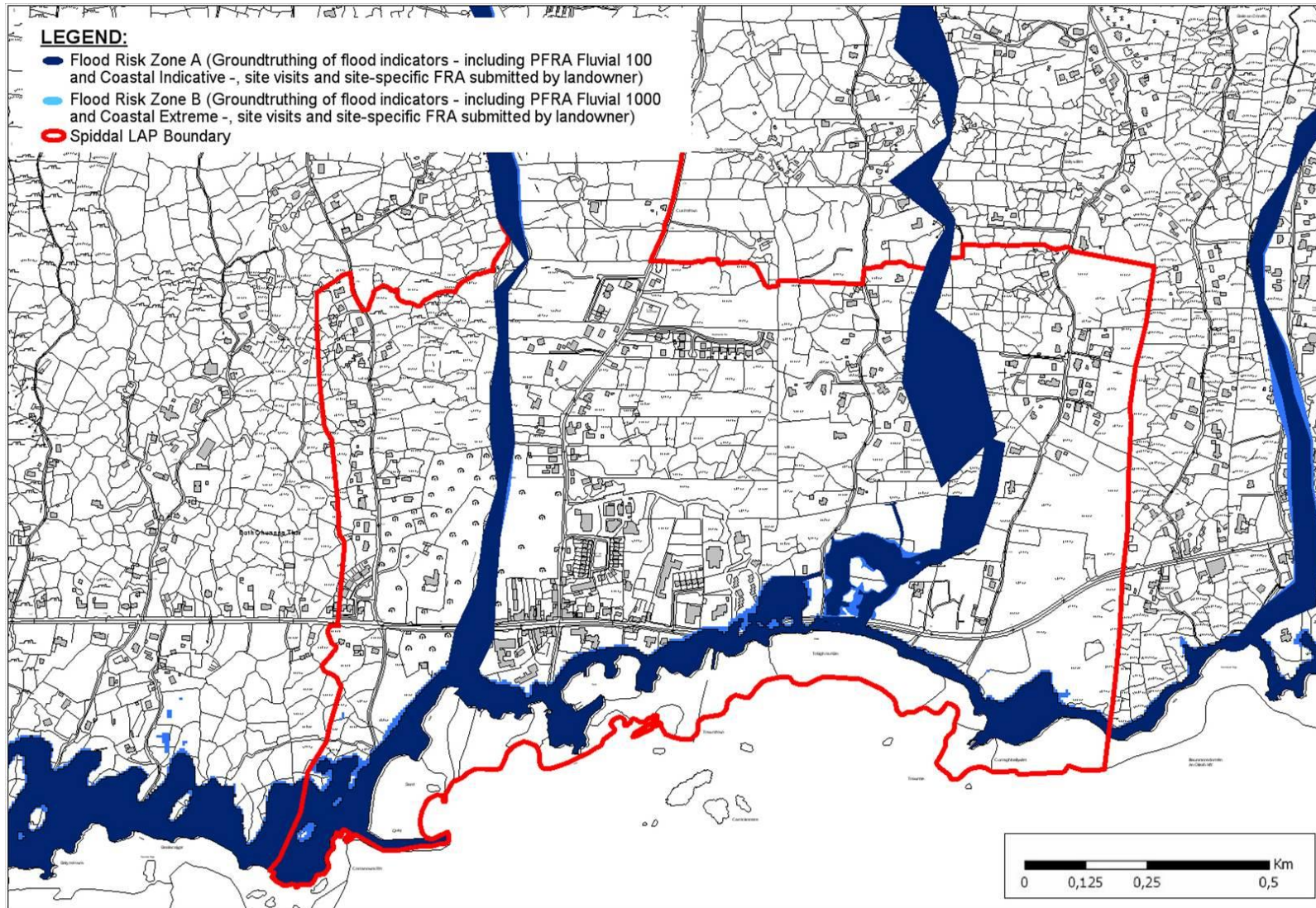


Figure 8 Indicative Flood Risk Zone Map for An Spidéal⁹

⁹ Note that the Council has taken into account information provided by the landowner for Material Alteration No. 2 lands (see Section 5.6) in the final delineation of the Flood Risk Zones. The landowner provided a site-specific FRA including revised Flood Risk Zone Mapping. The landowner also provided clarifying, additional information in relation to the site-specific FRA. It appears from the documentation submitted that the site-specific FRA is complete and takes into account combined tidal and fluvial factors as well as contributing towards the taking into account of climate change. The SFRA recommends that should the zoning of any Material Alteration No. 2 lands not be adopted as Recreation & Amenity, then the plan should provide for certain notification (see Section 5.6).

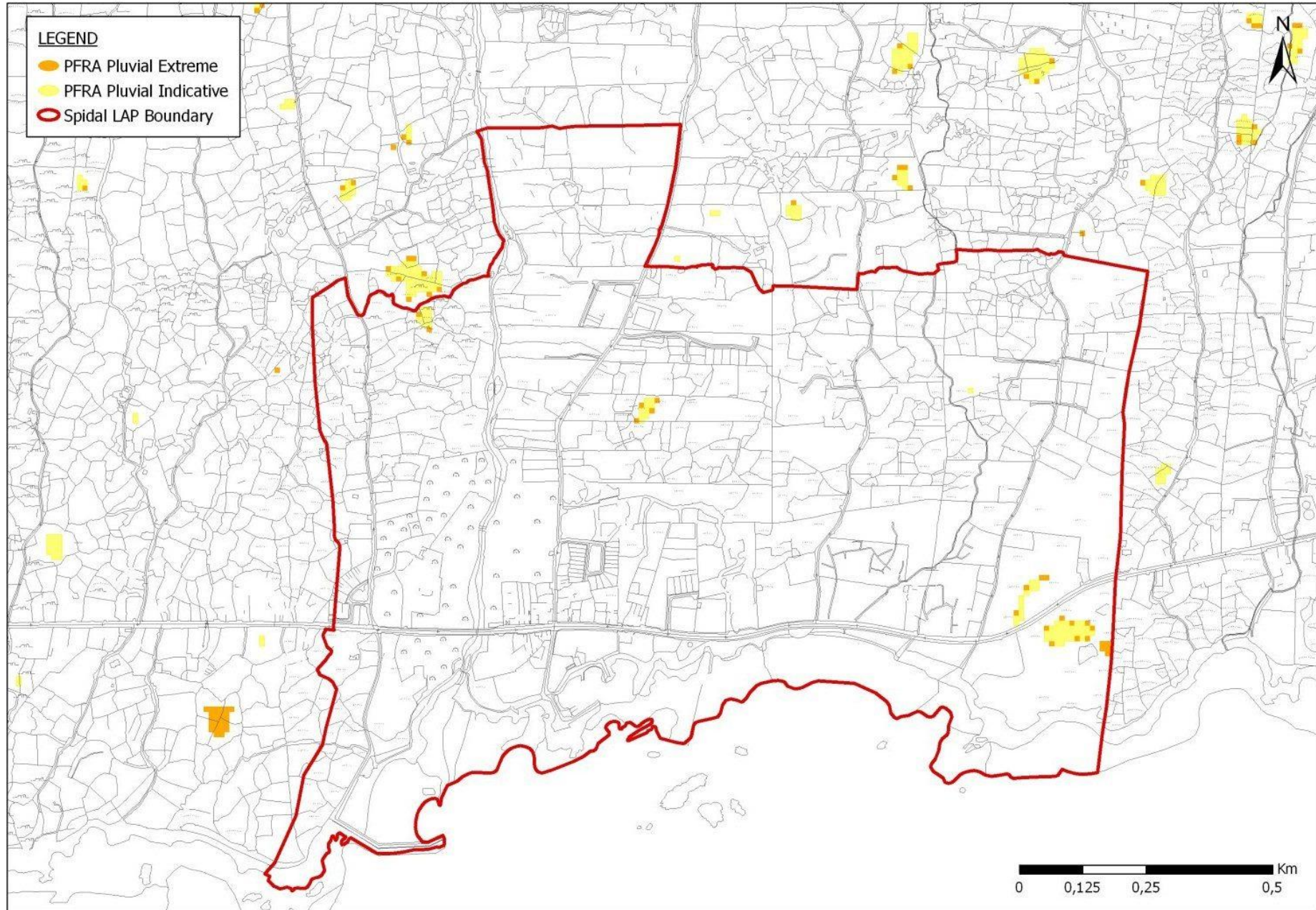


Figure 9 Pluvial PFRA Mapping for An Spidéal

Section 6 Recommendations and Mitigation

The following recommendations have been made in order contribute towards the avoidance and reduction of flood risk.

Measure	Integrated into the Plan
Incorporate the recommendations of the Flood Risk Assessment undertaken for the settlements and the incorporation of the findings of the PFRA as carried out by the OPW and any subsequent studies/ reports on same.	4.1 Environmental Policies P.W. 3
Protect Flood Zone A and Flood Zone B (see Sections 3.5 and 5.5 of this Stage 2 SFRA) from inappropriate development and direct developments/ land uses into the appropriate Flood Zone in accordance with the Flood Risk Management Guidelines 2009 (or any superseding document) (see summary of provisions of Guidelines in Appendix I of this Stage 2 SFRA). Where a development/land use is proposed that is inappropriate within the Flood Zone, then the development proposal will need to be accompanied by a Development Management Justification Test and Site-Specific Flood Risk Assessment in accordance with the criteria set out under the Flood Risk Management Guidelines 2009.	An Cheathrú Rua Plan O.F.R.C. 2 + An Spidéal Plan O.F.R.S. 2
Ensure that proposals for new developments located within identified or potential flood risk areas, or which may exacerbate the risk of flooding elsewhere, are assessed in accordance with the provisions of the Flood Risk Management Guidelines 2009 (or any updated/superseding document) and the relevant policies, objectives and guidelines in this Plan.	Strategic Development Objectives O.S.D. 7 Flood Risk Management and Assessment
Support, in co-operation with the OPW, the implementation of the EU Flood Risk Directive (2007/60/EC), the Flood Risk Regulations (SI No. 122 of 2010) and the DEHLG/OPW publication Flood Risk Management Guidelines 2009 (and any updated/superseding legislation or policy guidance). Galway County Council will also take account of the Catchment Flood Risk Management Plans (CFRAMs), Preliminary Flood Risk Assessment (PFRA) and County Galway Strategic Flood Risk Assessment 2012 and any recommendations and outputs arising from same that relate to or impact on the Plan Area.	4.1 Environmental Policies Flood Risk Management P.F.R.M. 1 + An Cheathrú Rua Plan 6.5.7 Flood Risk Management Policies: P.F.R.C. 1 + An Spidéal Plan 7.6.11 Flood Risk Management Policies: P.F.R.S. 1
Ensure the implementation of the DEHLG/OPW publication Flood Risk Management Guidelines 2009 (or any updated/superseding document) in relation to flood risk management within the Plan Area. This will include the following: a) Avoid, reduce and/or mitigate, as appropriate in accordance with the Flood Risk Management Guidelines 2009, the risk of flooding within the flood risk areas indicated on Flood Zone A and Flood Zone B (see Sections 3.5 and 5.5 of this Stage 2 SFRA), including fluvial, coastal/tidal,	4.1 Environmental Objectives Flood Risk Management O.F.R.M. 1 + An Cheathrú Rua Plan Specific Objectives: O.F.R.C. 1 + An Spidéal Plan Specific Objectives: O.F.R.S. 1

<p>pluvial and groundwater flooding, and any other flood risk areas that may be identified during the period of the Plan or in relation to a planning application.</p> <p>b) Development proposals in areas where there is an identified or potential risk of flooding (including that relating to the PFRA Pluvial areas) or that could give rise to a risk of flooding elsewhere will be required to carry out a Site-Specific Flood Risk Assessment, and justification test where appropriate, in accordance with the provisions of the Flood Risk Management Guidelines 2009 (or any superseding document). Any flood risk assessment should include an assessment of the potential impacts of climate change, such as an increase in the extent or probability of flooding, and any associated measures necessary to address these impacts.</p> <p>c) Development that would be subject to an inappropriate risk of flooding or that would cause or exacerbate such a risk at other locations shall not normally be permitted.</p> <p>d) Where certain measures proposed to mitigate or manage the risk of flooding associated with new developments are likely to result in significant effects to the environment or European sites downstream, such measures will undergo environmental assessment and Habitats Directive Assessment, as appropriate.</p>	
<p>Where the probability of flooding from rivers is low (less than 0.1%, flood zone C) the developer should satisfy him or herself that the probability of flooding is appropriate to the development being proposed.</p>	<p>4.1 Environmental Objectives Flood Risk Management O.F.R.M. 2</p>
<p>In the case of lands transected by the outer boundary Indicative Flood Zone A or B outer boundary, where it can be demonstrated to the satisfaction of the Planning Authority that the outer boundary does not reflect local topographical and/or flood path conditions, the Planning Authority may consider the extension of a zone that is outside the indicative flood zone area into this area subject to the submission of a Site Specific Flood Risk Assessment and Justification Test as appropriate and the developer satisfying him or herself that the probability of flooding is appropriate to the development being proposed</p>	<p>4.1 Environmental Objectives Flood Risk Management O.F.R.M. 3</p>
<p>Should the zoning of any Material Alteration No. 2 lands not be adopted as Recreation & Amenity, then the plan should provide for the notification of any future owner or developer that:</p> <p><i>These lands have been zoned according to the information contained in a site-specific flood risk assessment provided by the landowner and that there is still potential for some of the lands to flood. Available data</i></p>	<p>To be completed on adoption of the LAP</p>

currently is imperfect and does not allow for the definitive quantification of this potential. This does not preclude development once the proposed site design for any proposed development shows that it does not displace flood water thereby exposing lands elsewhere to unacceptable levels of flood risk and satisfies the applicant and the Council that the development itself to will not be exposed to unacceptable levels of flood risk.

A note to this effect should also be attached to the zoning map.

Appendix I: Summary of Related Provisions contained in the DEHLG Flood Guidelines for Indicative Flood Zones A and B

- The Sequential Approach, including the Justification test -

The key principles of the risk-based sequential approach (see Figure 10) to managing flood risk in the preparation of plans are set out in Chapter 3 of the DEHLG Flood Guidelines and should be followed for the preparation of the Amendments to the Gaeltacht Local Area Plan. These principles 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.

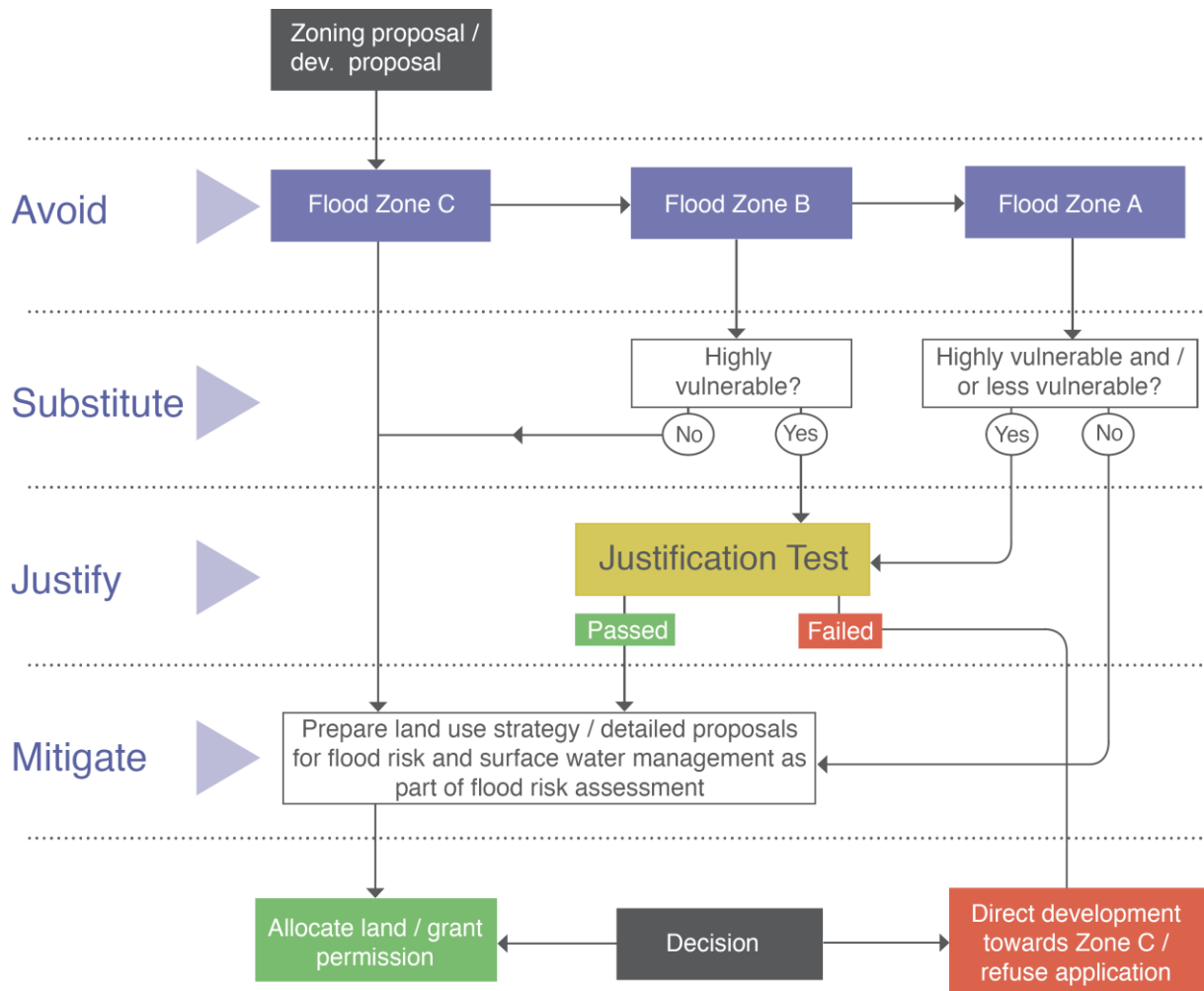


Figure 10 Sequential Approach Process¹⁰

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

¹⁰ 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 8 overleaf classifies the vulnerability of different types of development while Table 9 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.

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<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>
Less vulnerable development	<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>
Water-compatible development	<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 Classification of vulnerability of different types of development

	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

Table 9 Vulnerability Classes and Flood Zones

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 on Figure 11 below.

Box 4.1: Justification Test for development plans

Where, as part of the preparation and adoption or variation and amendment of a development/local area plan¹, 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 settlement²;
 - (ii) Comprises significant previously developed and/or under-utilised lands;
 - (iii) Is within or adjoining the core³ 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.
- 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 11 Justification Test