

Stage 2 Flood Risk Assessment

Gort Town Centre Public Realm, Co. Galway

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1 INTRODUCTION

1.1 Terms of Reference

This Stage 2 Flood Risk Assessment (FRA) was commissioned by BDP to provide an initial assessment of the potential risk of flooding to proposed development at Gort Town Centre Public Realm, Co. Galway (hereafter referred to as 'the scheme area').

1.2 Statement of Authority

This FRA has been prepared and reviewed by qualified professionals with appropriate experience in flood risk, drainage, and hydraulic modelling studies. The key staff members involved in this project are:

- Andrew Snowling – Environmental Technician with experience in flood risk assessment and environmental impact assessment.
- Duncan Hartwick *BEng (Hons) BSc (Hons)* – Senior Engineer specialising in flood risk assessment, hydraulic modelling, and hydrology.
- Paul Singleton *BEng (Hons) MSc CEng MIEI* – Chartered Civil and Environmental Engineer specialising in hydrology, flood risk assessment, and Sustainable Drainage Systems (SuDS); recognised industry professional providing training courses on these topics to the public and private sectors.

1.3 Purpose

The purpose of this Stage 2 FRA is to review and appraise the adequacy of available flood risk information, to identify sources of flooding that may affect the scheme area, and to broadly assess the extent of the risk of flooding at the scheme area and the potential impact of future development of the scheme area on flooding elsewhere. Where available information is deemed inadequate, this FRA will outline what further analysis is required. This FRA will also recommend mitigation measures to be considered as part of future development proposals to ensure compliance with relevant planning objectives and guidance.

1.4 Approach to the Assessment

1.4.1 Method of Assessment

Consideration has been given to the sources and extent of fluvial flooding at the scheme area, as well as flooding from pluvial sources, overland flow, and ponding of localised rainfall at the scheme area. A topographical survey of the scheme area was also commissioned and undertaken by a third party.

The method of assessment complies with the Source-Pathway-Receptor model, allowing for a spatial assessment of flood risk to people, properties, and the environment at the scheme area. The assessment investigates the existing runoff characteristics and the potential impact the proposed development will have on pluvial / surface water runoff.

For the purposes of this assessment, the primary stakeholders are the Office of Public Works (OPW) and Galway County Council (CC). OPW and Galway CC data has been used to form the basis of this assessment and is presented in line with the relevant guidance and requirements.

1.4.2 Hydraulic Model Status

The scheme area and surrounding area are included in flood maps produced as part of the OPW's Catchment Flood Risk Assessment and Management (CFRAM) programme and Preliminary Flood Risk Assessment (PFRA). The scheme area and surrounding area were part of the OPW Western CFRAM study and are included in the 'Gort Flood Extent' maps.

1.4.3 Planning Guidelines

The requirements for flood risk assessments are generally as set out in the 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities', published by the OPW and Department of the Environment, Heritage and Local Government in November 2009 (hereafter referred to as 'the OPW Guidelines'). The OPW Guidelines are supplemented by Departmental Circular PL 2/2014 issued by the Department of Environment, Community and Local Government on 13th August 2014, which relates to use of OPW flood mapping in assessing planning applications and clarifications of advice contained within the OPW Guidelines. Further guidance is also provided in the CIRIA Research Project 624 'Development and Flood Risk: Guidance for the Construction Industry'.

Planning objectives and guidance applicable to the scheme area are set out in the 'Galway County Development Plan 2022-2028' and 'Strategic Flood Risk Assessment for the Galway County Development Plan 2022-2028' (hereafter referred to as 'the Galway SFRA').

The Galway SFRA was prepared in accordance with the requirements of the OPW Guidelines and adopts an identical 'Flood Zone' standard. Flood Zones are extents associated with specific design flood events used to determine the suitability of different types of development from a flood risk perspective. They are defined in both the OPW Guidelines and Galway SFRA as follows:

- 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 and 0.5% or 1 in 200 for coastal flooding)
- 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)

The OPW Guidelines specify that Flood Zones are to be used to determine the suitability of proposed developments and are to be derived from 'present day' hydrological estimates (i.e., without inclusion of climate change allowances) without taking account of flood defences. The OPW Guidelines also clarify that proposed developments should be designed to be resilient to the effects of climate change.

The OPW Guidelines state that Stage 2 FRAs should "*confirm sources of flooding that may affect a plan area of proposed development site, to appraise the adequacy of existing information, and to determine what surveys and modelling approach is appropriate*". Planning and development decisions can therefore be made based on the outcomes of a Stage 2 FRA provided a precautionary approach was used. However, further work as part of a Stage 3 FRA may be recommended and / or required.

2 SCHEME AREA AND DEVELOPMENT DETAILS

2.1 Scheme Area Location and Context

The scheme area location is shown in Figure 2.1. The scheme area boundary and water features are shown in Figure 2.2.

Figure 2.1: Scheme Area Location Context

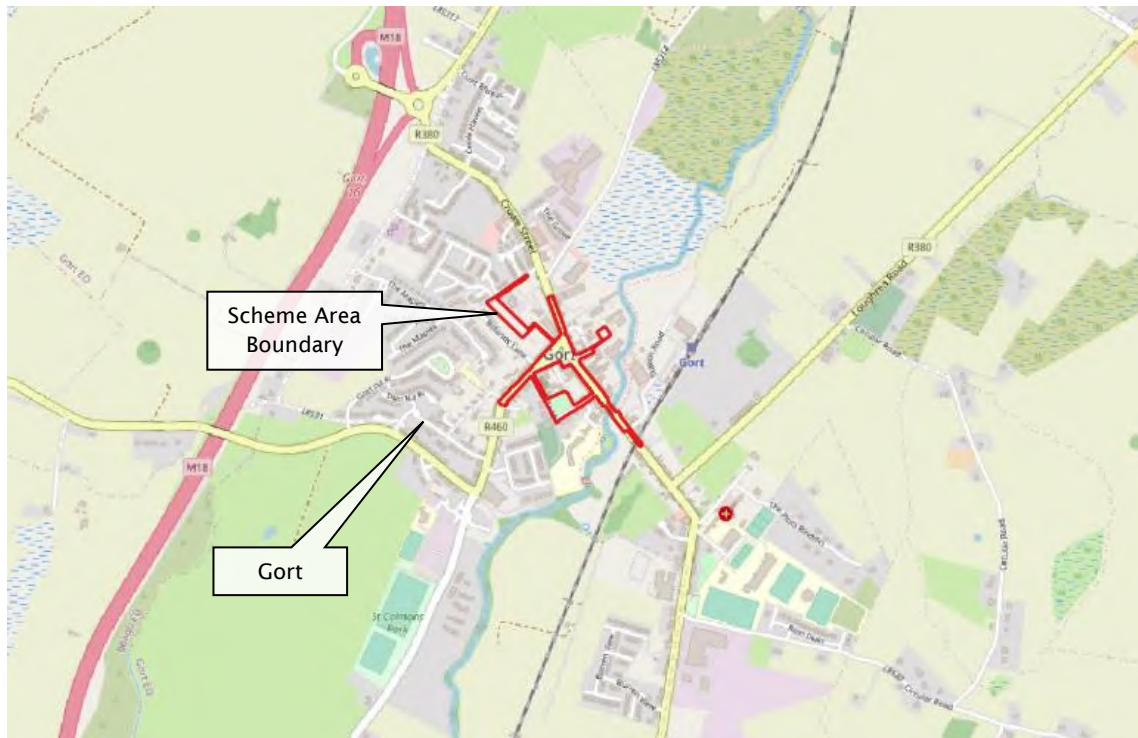
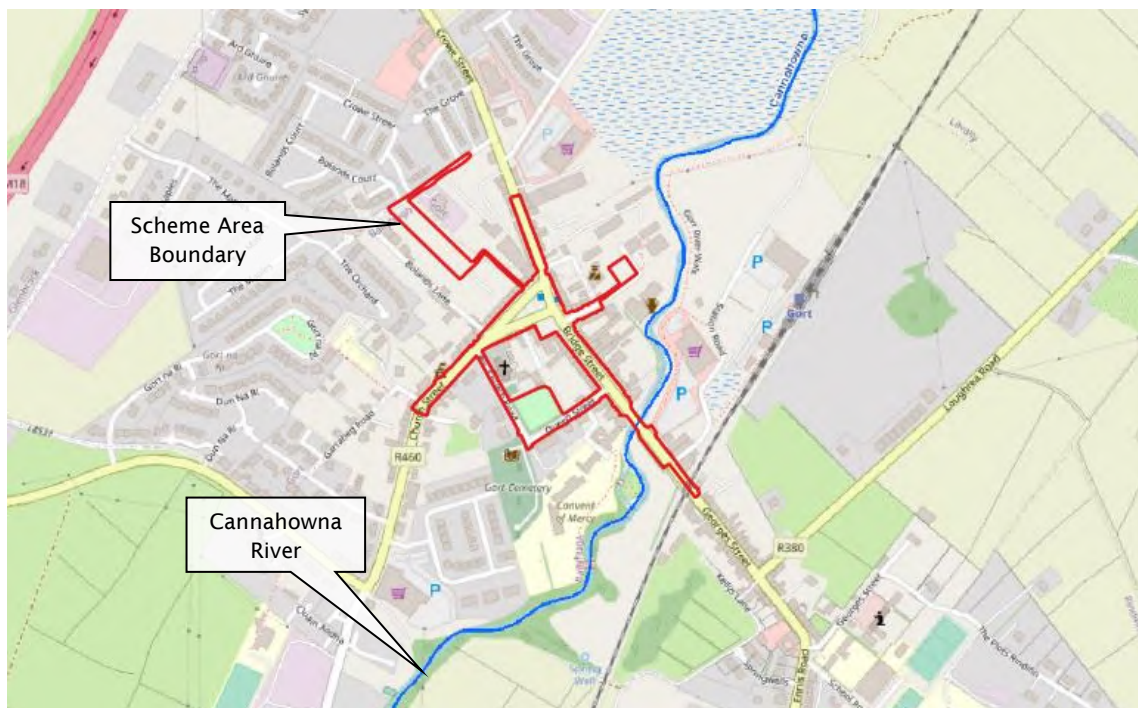


Figure 2.2: Scheme Area Boundary and Affecting Water Features



2.2 Scheme Area Description

The existing scheme area comprises existing developed land in the centre of Gort, Co. Galway.

A watercourse referred to as the 'Cannahowna' on the EPA / FSU datasets flow through the south-eastern extent of the scheme area.

2.3 Proposed Development

Proposed development that this FRA is intended to support is summarised as follows:

Gort Town Centre Public Realm Enhancement Project on Market Square, Bridge Street, George Street, Crowe Street, Barrack Street, Queen Street, Church Street, and Canon Quinn Park to include:

1. *Redesigned paved areas along Market Square, Bridge Street, George Street, Crowe Street, Barrack Street, Queen Street and Church Street including new surface materials, installation of a new lighting scheme, hard and soft landscaping and street furniture (The proposed works are located within the Architectural Conservation Area, and in the vicinity of Recorded Protected Structures RPS No 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 436, 437, 438, 439, 440, 441, 442, 3445, 3451, 3452, 3453, 3459, 3464, 3467, 3468, 3469, 3471, 3472.*
2. *Provision of an upgraded and expanded pedestrianised civic/public space in the Market Square.*
3. *Provision of new pedestrian crossings.*
4. *Installation of new road alignments including reduction in carriageway widths and traffic calming measures.*
5. *Installation of new street furniture and cycle parking.*
6. *Rationalised on-street car parking throughout the application area including the provision of new disabled and age friendly parking provision.*
7. *The provision of 2No. new public off-street car parks and Crowe Street and Barrack Street.*
8. *Installation of new landscaping including street trees and planting.*
9. *Upgrade works to the existing Canon Quinn Park including the installation of play equipment, seating, lighting and ancillary infrastructure.*
10. *Installation of a new signage and way-finding scheme.*
11. *Undergrounding of overhead cables and the removal of redundant overhead cabling.*
12. *Installation of upgraded surface water drainage infrastructure including provision of nature-based, sustainable urban drainage solutions.*
13. *The relocating of existing public bus-stop to Bridge Street/George Street and provision 1No. new coach drop off area on Market Square.*
14. *All other associated site and ancillary works at Market Square, Bridge Street, George Street, Crowe Street, Barrack Street, Queen Street, Church Street, and Canon Quinn Park.*

Proposed layout drawings for the current stage of development are included in Appendix A.

2.4 Vulnerability Classification

The proposal comprises development with the vulnerability classifications shown in Table 2.1, based on the classification criteria set out in the OPW Guidelines.

Table 2.1: Vulnerability Classification

Part	Use	Classification
Green Areas / Public Realm Regeneration	Open Amenity Space	Water-Compatible Development

3 AVAILABLE FLOOD RISK INFORMATION

Several available sources of flood risk information were appraised and used to build an understanding of the potential risk of flooding to the scheme area. This section highlights key findings from this information.

3.1 Internet Search

News articles published online report on past flooding from various sources that affected Gort and the surrounding area in 2016¹. However, there is no evidence of flooding on roads or lands within the scheme area.

3.2 Galway County Council

3.2.1 Galway County Development Plan 2022-2028

Section 14.6 of the County Development Plan sets out the following relevant flood risk policy objectives:

- FL 2 – Comply with the requirements of the OPW Guidelines and the accompanying Technical Appendices (including any updated / superseding documents). This will include the following:
 - (a) Avoid, reduce, and / or mitigate, as appropriate, in accordance with the OPW Guidelines.
 - (b) 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 FRA and Justification Test where appropriate, in accordance with the provisions of the OPW Guidelines (or any superseding document). Any FRA 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.
 - (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.
 - (d) Galway CC shall work with other bodies and organisations, as appropriate, to help protect critical infrastructure, including water and wastewater, within the county, from risk of flooding.
- FL 6 – Ensure that new developments are adequately serviced with surface water drainage infrastructure and promote the use of Sustainable Drainage Systems (SuDS) in all new developments. Surface water runoff from development sites will be limited to pre-development levels, and planning applications for new developments will be required to provide details of drainage / SuDS proposals.
- FL 8 – Protect Flood Zone A and Flood Zone B from inappropriate development and direct developments / land uses into the appropriate Flood Zone in accordance with the OPW Guidelines (or any superseding document) and the guidance contained in Development Management Standard 69. Site-specific FRAs are required for planning applications in areas at elevated risk of flooding, even for developments appropriate to the particular flood zone. The detail of these site-specific FRAs will depend on the level of risk and scale of development. A detailed site-specific FRA should quantify the risks, the effects of selected mitigation, and the management of any residual risks. The Council shall have regard to the results of any CFRAM Studies in the assessment of planning applications. Where a development / land use is proposed that is inappropriate within the Flood Zone, the development proposal will need to be accompanied by a Development Management Justification Test in addition to the site-specific FRA. In Flood Zone C, where the probability of flooding is low (less than 0.1%), a site-specific FRA may be required, and the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed.
- FL 10 – SFRAs and site-specific FRAs shall provide information on the implications of climate change with regard to flood risk in relevant locations. The 2009 OPW Draft Guidance on Assessment of Potential Future Scenarios for Flood Risk Management (or any superseding document) shall be consulted with to this effect.

¹ "Multiple Roads near Gort blocked by flooding" GalwayDaily available at: <https://www.galwaydaily.com/news/multiple-roads-near-gort-blocked-by-flooding/> [Accessed 23/10/23]

3.2.2 Strategic Flood Risk Assessment for the Galway County Development Plan 2022-2028

A Stage 2 SFRA was published in May 2021 to inform the current County Development Plan. The SFRA sets out planning guidelines applicable to development within the County that are generally consistent with the OPW Guidelines.

The Galway SFRA references the 'Flood Risk Management Plan for the Galway Bay South East River Basin (UOM29)' published in 2018, which identifies the existing Flood Relief Scheme in Gort and the following measures in relation to the scheme:

- Ongoing maintenance of the existing scheme is to be undertaken.
- A flood forecasting system is to be developed, requiring the installation of a telemetered level gauge at Gort Bridge.

It is noted that the Galway SFRA does not include flood mapping for Gort.

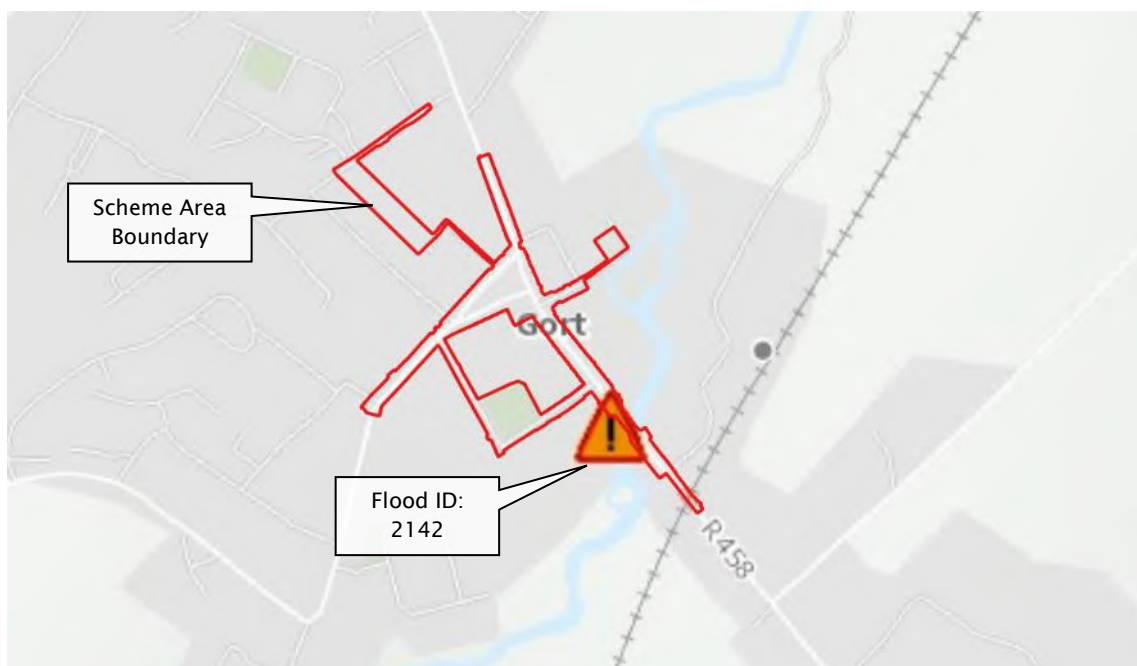
3.3 Office of Public Works

3.3.1 Past Flood Event Mapping

OPW 'Past Flood Events' dataset has one record of fluvial (river) flooding in Gort as shown in Figure 3.1.

- Cannahowna Gort Village Feb 1996 (ID-2142) located adjacent to south-eastern boundary of the scheme area². Flooding mentioned in environmental impact statement drainage scheme report.

Figure 3.1: OPW Past Flood Events (Extract from floodinfo.ie)



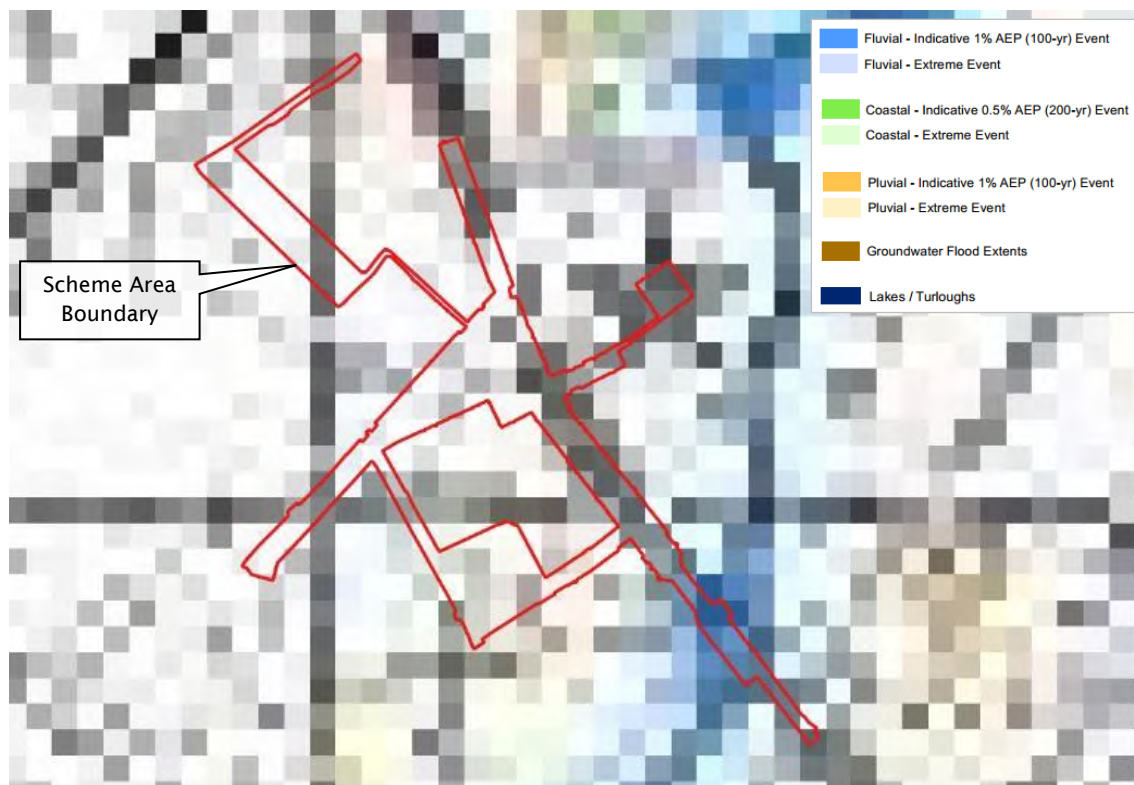
² Report ID-2142 Floodinfo.ie available at: https://www.floodinfo.ie/map/pf_addinfo_report/2142/ [Accessed 24/10/23]

3.3.2 Preliminary Flood Risk Assessment

The first stage of the CFRAM process involved a national Preliminary Flood Risk Assessment (PFRA), which included indicative flood mapping for the entire country. The PFRA is only a preliminary assessment based on available or readily derivable information. The analysis was undertaken to identify areas prone to flooding to inform further stages in the CFRAM process.

It is understood that OPW PFRA flood mapping is now considered superseded by the OPW. However, it has been used to assess pluvial flood risk within the scheme area. PFRA flood mapping indicates that the scheme area is unaffected by pluvial flooding, as shown in the extract provided in Figure 3.2. The full PFRA flood map is included in Appendix B.

Figure 3.2: PFRA Indicative Mapping



3.3.3 Catchment Flood Risk Assessment and Management

3.3.3.1 Present Day

As part of the Catchment Flood Risk Assessment and Management (CFRAM) Programme, the OPW produced detailed flood maps for areas identified by the national Preliminary Flood Risk Assessment (PFRA) as being at significant risk of flooding. CFRAM flood maps based on detailed hydraulic modelling are available for the scheme area and surrounding area.

The scheme area and surrounding area are included (i.e., duplicated) on two CFRAM flood maps. Extracts from both maps are shown in Figure 3.3 and Figure 3.4 for completion. The original CFRAM flood maps are included in Appendix B.

It is noted that the detailed CFRAM flood mapping shows a modelled watercourse that is not included in EPA / FSU datasets. The CFRAM modelled watercourse is shown to flow from the north-east of the scheme area in a north-eastward direction towards the Cannahowna River to which it discharges.

CFRAM flood mapping shows that parts of the scheme area (the northmost and southmost extents) lie in the fluvial floodplain of the adjacent watercourse system. It is also shown that the scheme area is not within an area defended by the existing Flood Relief Scheme at Gort.

Figure 3.3: CFRAM Present Day Flood Map (Gort Tile 03)

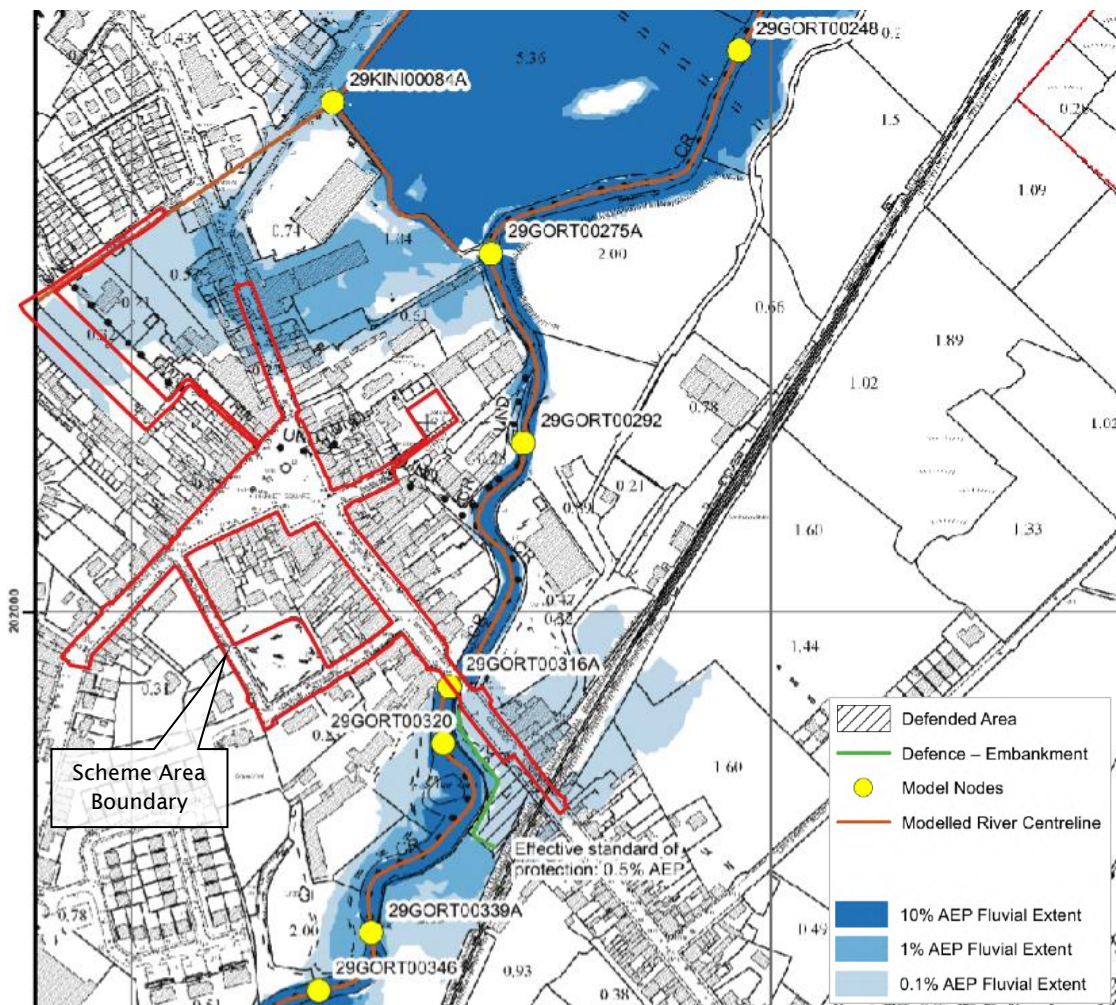
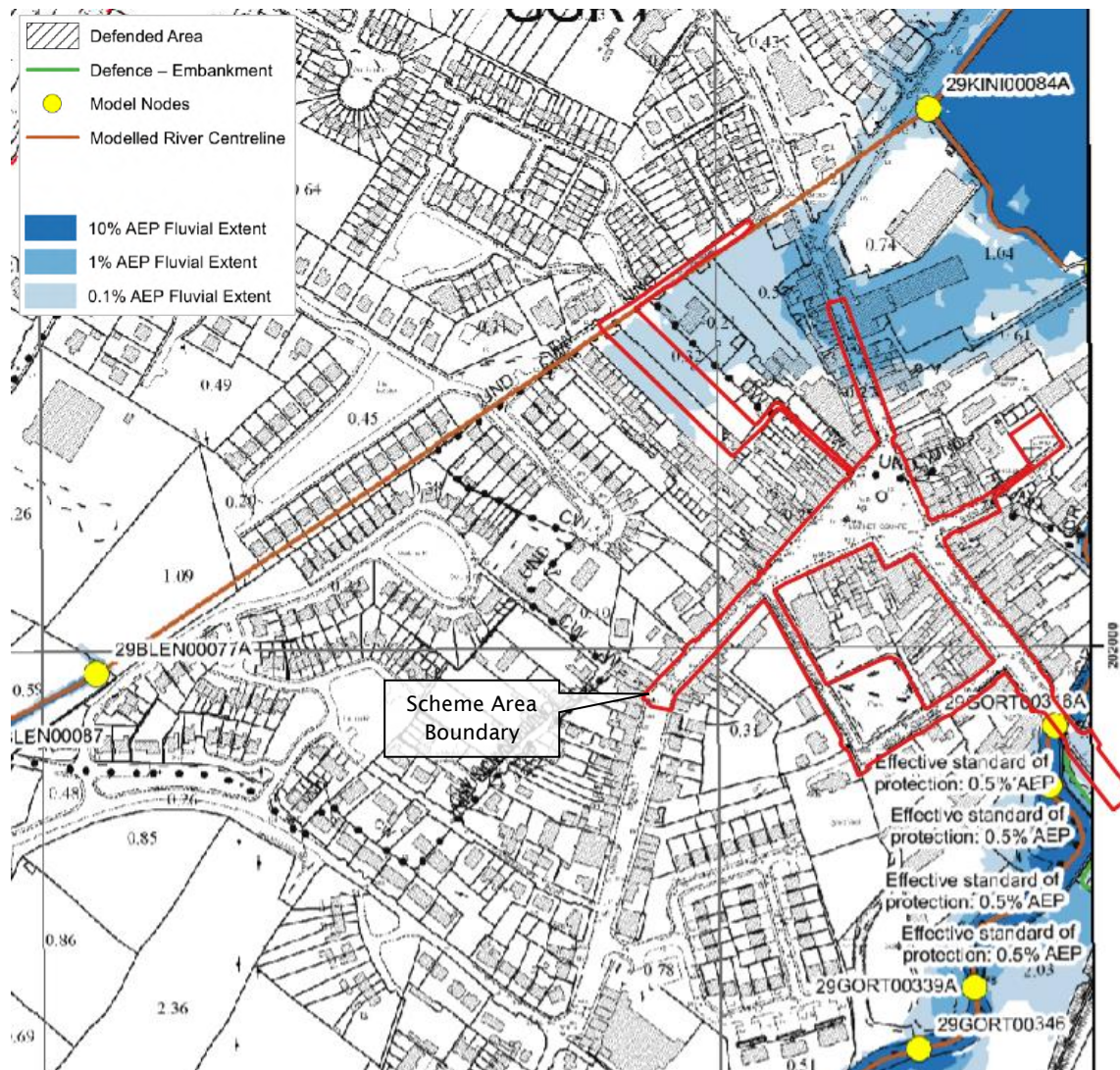
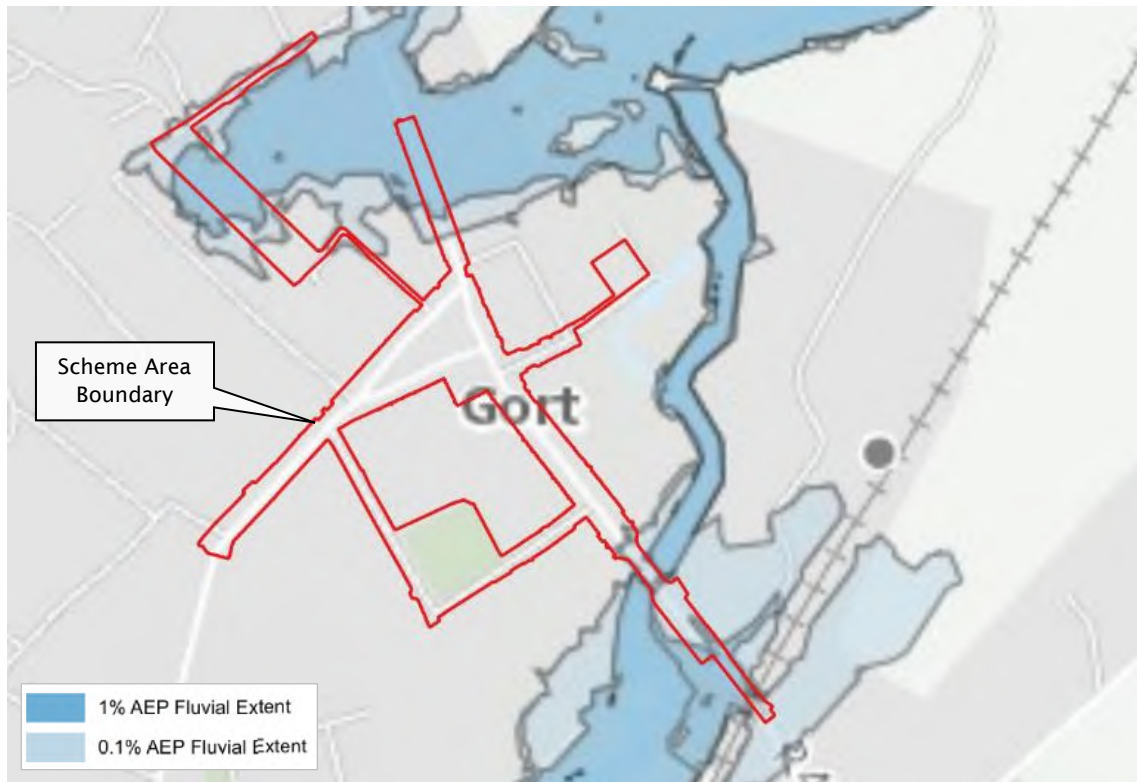


Figure 3.4: CFRAM Present Day Flood Map (Gort Tile 02)


3.3.3.2 *Climate Change*

CFRAM climate change flood extents are available via the OPW's online portal floodinfo.ie. As shown in Figure 3.5, parts of the scheme area are affected by both the 1% AEP and 0.1% AEP Mid-Range Future Scenario (MRFS) flood event.

Figure 3.5: CFRAM Mid-Range Future Scenario Flood Extents (Extract from floodinfo.ie)



3.4 GSI Flood Data

As shown in Figure 3.6 Geological Survey Ireland (GSI) above-ground groundwater flood data indicates potential flooding to the north-east of the scheme area. The indicative area generally coincides with the watercourse system and undeveloped / open lands.

Figure 3.6: GSI Above-Ground Groundwater Flooding



4 INITIAL ASSESSMENT OF FLOOD MECHANISMS

Development control procedures aim to avoid inappropriate development in areas determined to be at risk of flooding and new development that has the potential to increase flood risk elsewhere, in accordance with the OPW Guidelines. This section provides an initial assessment of the extent of the risk of flooding at the scheme area and the potential impact of future development of the scheme area on flooding elsewhere.

4.1 Initial Assessment

Table 4.1 presents an initial assessment of potential sources of flooding at the scheme area based on available flood risk information review and stakeholder consultation. Flooding mechanisms determined to be significant or possibly significant are assessed in further detail within this section.

Table 4.1: Initial Assessment of Potential Flooding Mechanisms

Source / Pathway	Significant?	Reason
Fluvial Flooding	Yes	OPW flood mapping indicates that the scheme area is affected by fluvial flooding.
Coastal Flooding	No	N/A
Pluvial / Surface Water Flooding	Yes	No evidence of pluvial flooding has been found during an initial data review.
Surface Water Discharge	Possible	Any development has the potential to increase the impermeable area at a scheme area and thereby cause an increase in the rate and volume of surface water runoff from the scheme area.
Flooding from Urban Drainage Systems	No	There is no evidence of surcharging / flooding from urban drainage systems on roads or lands within the scheme area boundary or directly adjacent to the scheme area.
Groundwater Flooding	No	Ground conditions within the scheme area are impermeable. GSI data indicates that the scheme area is not at risk of groundwater flooding.
Artificial Sources of Flooding (e.g., Impoundments)	No	A screening assessment based on OSI mapping indicates that there are no reservoirs or other artificial impoundments in close proximity to or that drain towards the scheme area.

4.2 Surface Water (Pluvial) Flooding

The scheme area may be subject to an increase in impermeable area, meaning it has the potential to cause an increase in flood risk elsewhere if surface water discharge is not adequately managed.

Mitigation of residual impact of surface water to the development and off-site receptors by means of an effective surface water drainage network and surface water management using SuDS principles and components is detailed in Section 5.2.

4.3 Fluvial Flooding

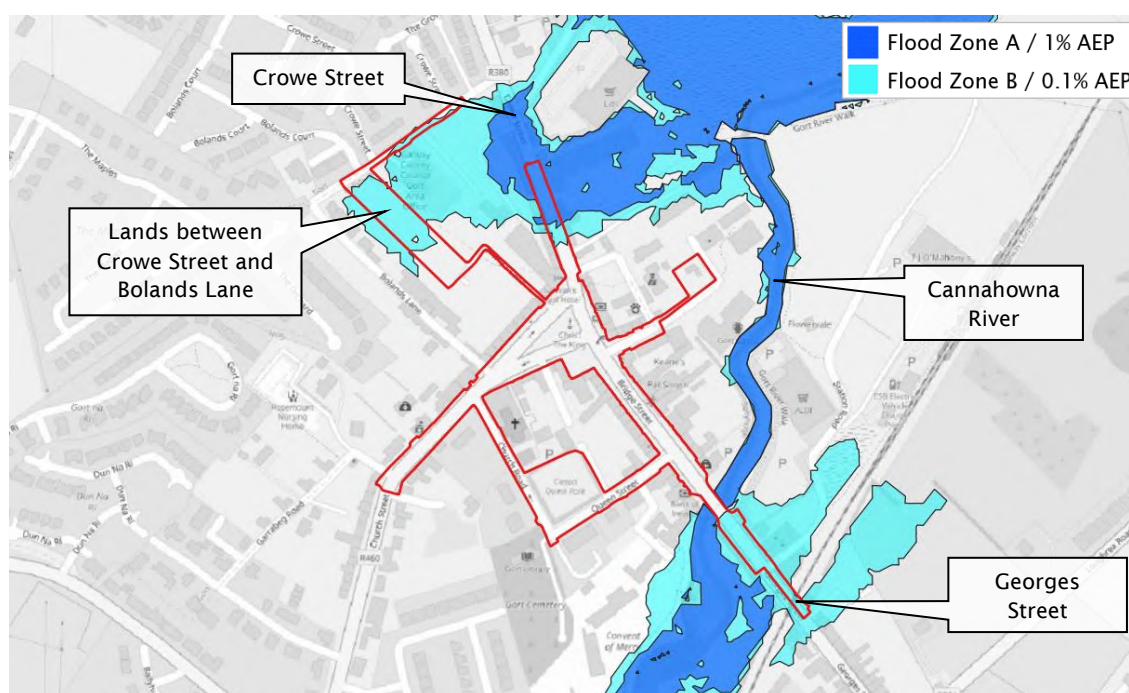
4.3.1 Present Day

The scheme area is shown to be affected by 1% AEP and 0.1% AEP present day fluvial flooding (i.e., Flood Zone A and Flood Zone B, respectively) on OPW CFRAM flood mapping. The two parts of the scheme area that are affected are:

- Georges Street in the south-eastern extent of the scheme area is affected by Flood Zone B.
- Crowe Street in the north-western extent of the scheme area is affected by Flood Zone A and Flood Zone B (lands between Crowe Street and Bolands Lane are only affected by Flood Zone B).

Since the two parts are affected by flooding from different parts of the adjacent watercourse system, flood levels from different CFRAM model nodes have been used to assess each part separately and to inform this assessment (refer to the two subsections below).

Figure 4.1: CFRAM Present Day Fluvial Flood Extents Map



4.3.1.1 Georges Street

Georges Street is directly adjacent to a node on the CFRAM map, so flood levels shown in Table 4.2 are taken directly from the relevant node (29GORT00316A).

As shown in Figure 4.1, the Georges Street part of the scheme area is only affected by the 0.1% AEP floodplain, lying outside the 1% AEP extents. Based on best available OPW height data, the lowest ground level within the affected area is 22.5 mOD, so the maximum predicted depth of flooding during a 0.1% AEP extreme event is 450 mm.

Table 4.2: CFRAM Fluvial Flood Levels (Georges Street) – Present Day

CFRAM Node Reference	Flood Zone A / 1% AEP Flood Level (mOD)	Flood Zone B / 0.1% AEP Flood Level (mOD)
29GORT00316A	22.07	22.95

4.3.1.2 Crowe Street

As shown in Figure 4.1, Crowe Street and surrounding parts of the scheme area are affected by flooding shown to flow overland from the watercourse to the north-east. In the absence of an applicable CFRAM map, comparison of the flood extents with OPW 2 m LiDAR height data provides the flood levels presented in Table 4.3.

The Crowe Street part of the scheme area has a lowest existing ground level of 18.8 mOD, meaning the maximum predicted depth of flooding is up to 500 mm and 1 m during the 1% AEP and 0.1% AEP flood events, respectively.

The lands between Crowe Street and Bolands Lane lie outside the 1% AEP floodplain. The maximum predicted depth of flooding is up to 900 mm for the 0.1% AEP flood event.

Table 4.3: CFRAM Fluvial Flood Levels (Crowe Street and Surrounds) – Present Day

Estimation Point	Flood Zone A / 1% AEP Flood Level (mOD)	Flood Zone B / 0.1% AEP Flood Level (mOD)
Overland (2 m height data)	19.30	19.80

4.3.2 Effect of the Development

The proposed development does not include any significant changing of existing ground levels and therefore will have no impact on flood risk elsewhere.

4.3.3 Effect of Climate Change

The OPW Guidelines require site-specific FRAs to consider increased flood risk to proposed development under climate change scenarios. OPW guidance suggests using a Mid-Range Future Scenario (MRFS) to account for climate change. As outlined in Section 3.3.3.2, MRFS flood mapping has been produced as part of the CFRAM maps. The MRFS climate change data does not include flood levels / nodes, so climate change flood levels for the two parts of the scheme area shown to be affected have been estimated by comparing the MRFS flood extents with OPW 2 m LiDAR height data.

The estimated MRFS effect is a maximum increase in flood levels of 530 mm in the Georges Street area and 200 mm in the Crowe Street part of the scheme area. Table 4.4 and Table 4.5 summarise the estimated climate change levels.

Table 4.4: CFRAM Fluvial Flood Levels (Georges Street) – Climate Change

Estimation Point	1% AEP Climate Change Flood Level (mOD)	0.1% AEP Climate Change Flood Level (mOD)
Overland (2 m height data)	22.60	23.40

Table 4.5: CFRAM Fluvial Flood Levels (Crowe Street and Surrounds) – Climate Change

Estimation Point	1% AEP Climate Change Flood Level (mOD)	0.1% AEP Climate Change Flood Level (mOD)
Overland (2 m height data)	19.50	20.00

5 FINDINGS AND RECOMMENDATIONS

5.1 Summary of Findings

The scheme area has been shown by this assessment to partially lie in the fluvial floodplain of the adjacent watercourse system. In relation to Flood Zones as defined by the OPW Guidelines, most of the scheme area lies in Flood Zone C while parts are in Flood Zone A and Flood Zone B.

There are no other significant flood mechanisms at the scheme area.

5.2 Design Measures

5.2.1 Land Use

This assessment demonstrates that the majority of the scheme area lies in Flood Zone C while parts are located in Flood Zone A and Flood Zone B. It is noted that the nature of the proposed urban re-development / improvement of existing areas is unable to restrict development to areas outside the fluvial floodplain.

The proposed development is classed as 'water-compatible' and as such, is appropriate in any Flood Zone, meaning there is no policy-based restriction on land use within the scheme area boundary. Therefore, a Justification Test is not required.

5.2.2 Effect of Development

While partly sited in Flood Zone A and Flood Zone B, the proposed development will result in no significant changes to existing ground levels within the floodplain and as such, can have no impact of flood risk elsewhere.

However, as the proposed design progresses, it is noted that any change to existing ground levels (increases or decreases) and / or any alterations to the existing watercourse channel should be assessed in detail as these have the potential to increase flood risk elsewhere, which is not compliant with the SFRA or OPW Guidelines, as part of a Stage 3 site-specific FRA.

5.2.3 Design Levels

The OPW Guidelines require freeboard to be applied to relevant design flood levels when setting Finished Floor Levels (FFLs) and Finished Ground Levels (FGLs). Generally, freeboard is applied to Flood Zone A for less vulnerable development (access roads, commercial units, etc.) and to Flood Zone B for highly vulnerable development (residential units, creches, etc.).

There is no design level or freeboard requirement for water compatible development, meaning no minimum FFLs / FGLs will apply.

5.2.4 Drainage Design

Surface water drainage design should comply with the requirements of the "Galway County Development Plan 2022-2028" and standards of Galway CC. The 'Galway County Development Plan 2022-2028' states that it is an objective to incorporate and promote the use of SuDS. SuDS components (green roofs, rainwater harvesting, permeable pavement, infiltration trenches, soakaways, etc.) should be considered in relation to the nature and character of the scheme area.

SuDS proposals for the project (submitted separately) have been subject to a detailed SuDS Assessment (ref.: M02191-03_DG02) undertaken by McCloy Consulting. The purpose of the report was to quantitatively evaluate the SuDS features proposed as part of the Gort Town Centre Public Realm scheme. The SuDS Assessment considered both the hydraulic and treatment performance of the proposed SuDS components.

The assessment demonstrates that the proposed SuDS components provide significant quantity and quality benefits compared to the existing pre-development scenario.

5.2.4.1 *Drainage System Maintenance*

The owner / occupier(s) shall be responsible for maintenance of drainage networks at the scheme area and ensure that maintenance of the drainage system is provided for. The detailed drainage layout for the scheme area should ensure that key SuDS components requiring maintenance are situated in accessible public locations.

Maintenance plans for drainage assets should include (where applicable):

- Cyclical (min. annually) check of all surface water drainage features – in particular, clearing of debris.
- Cyclical (min. annually) visual inspection of any surface or underground features – blockages and obstructions to be removed by jetting, as required.

5.3 Summary of Flood Risk and Mitigation Measures

Table 5.1 summarises the mechanisms of flooding identified by this FRA, their associated hazards / consequence, and recommended measures to mitigate the predicted flood risk.

Table 5.1: Summary of Flood Risk and Mitigation Measures

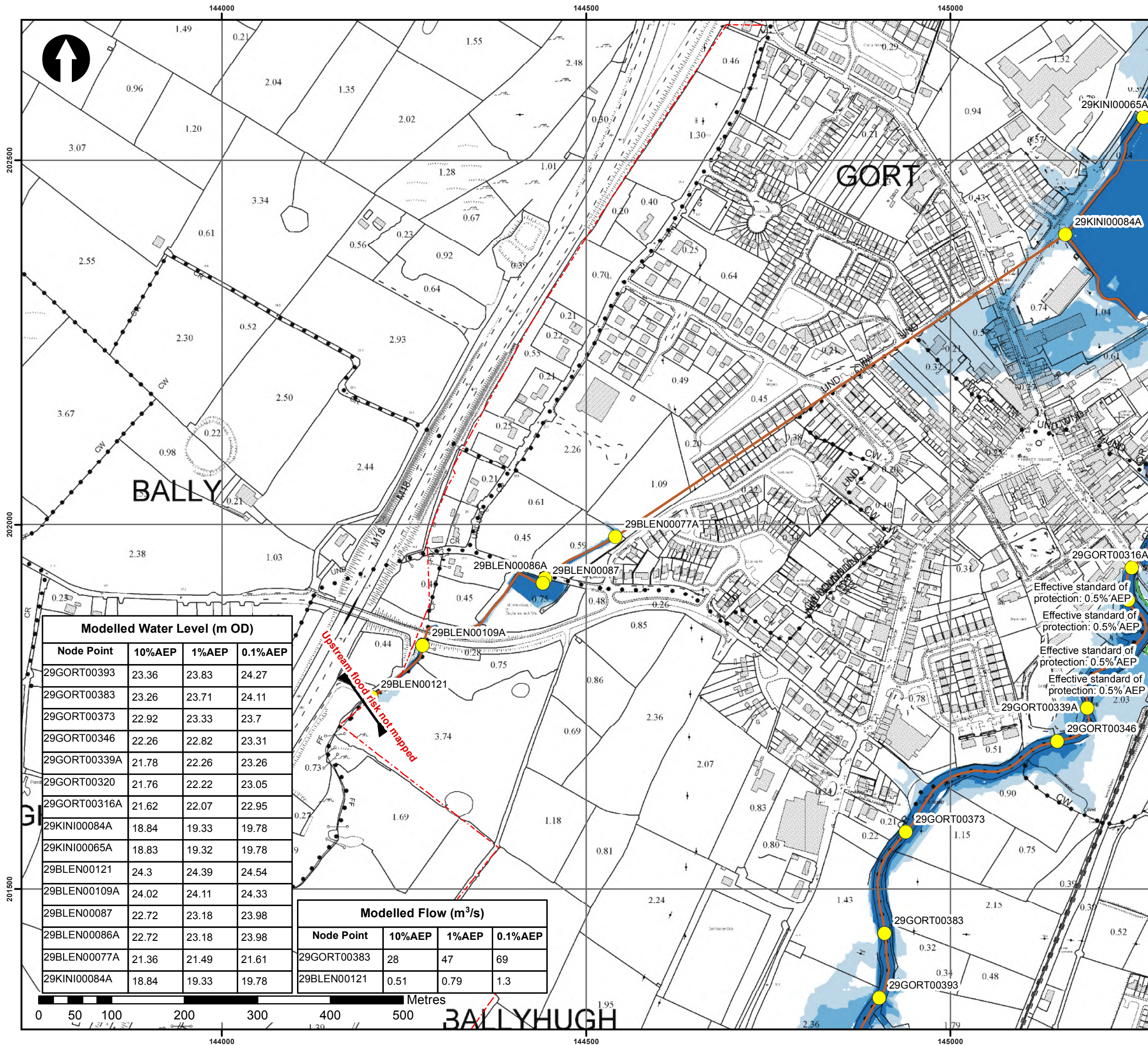
Flood Risk	Hazards / Consequence	Mitigation Measures
Fluvial flooding (present day)	Risk to life and property	The scheme area lies partially in Flood Zone A and B. There is no policy-based restriction on water-compatible development and the proposal is considered 'appropriate' in any Flood Zone.
Fluvial flooding (effect of climate change)	Risk to life and property	Similar to the above, while the proposed development is sited in the climate change floodplain, it is considered 'appropriate' without further mitigation.
Fluvial flooding (effect of development)	Increased risk to adjacent lands and developments	The proposed development will not lead to any significant change to existing ground levels so will not impact flood risk elsewhere.
Pluvial / surface water flooding	Risk to property at the scheme area, and risk to adjacent lands and property	On-site surface water flooding will be mitigated by a drainage system that complies with Galway CC's drainage standards and based on SuDS principles. SuDS proposals will ensure a reduction in the volumes and rates of surface water runoff from the scheme area caused by development, providing a betterment in terms of pluvial flooding.

Appendix A

Site Drawings

Appendix B

OPW Flood Mapping



Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

AFA Boundary

Defended Area

Defence – Embankment

Model Nodes

Modelled River Centreline

10% AEP Fluvial Extent

1% AEP Fluvial Extent

0.1% AEP Fluvial Extent

IMPORTANT USER NOTE:
THE FLOWS PRESENTED IN THIS MAP ARE RELEVANT TO THE LOCATION SHOWN ONLY. THEY SHOULD NOT BE USED WITHOUT FIRST REFERRING TO THE HYDRAULIC MODELLING REPORT TO UNDERSTAND THE CONTEXT OF THE HYDROLOGY AT THE SITE.

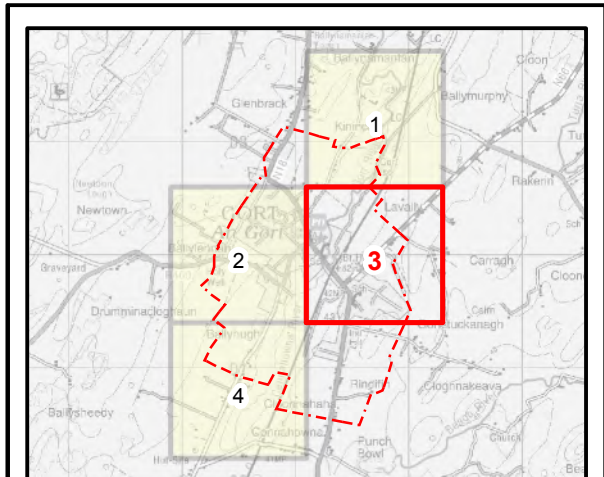
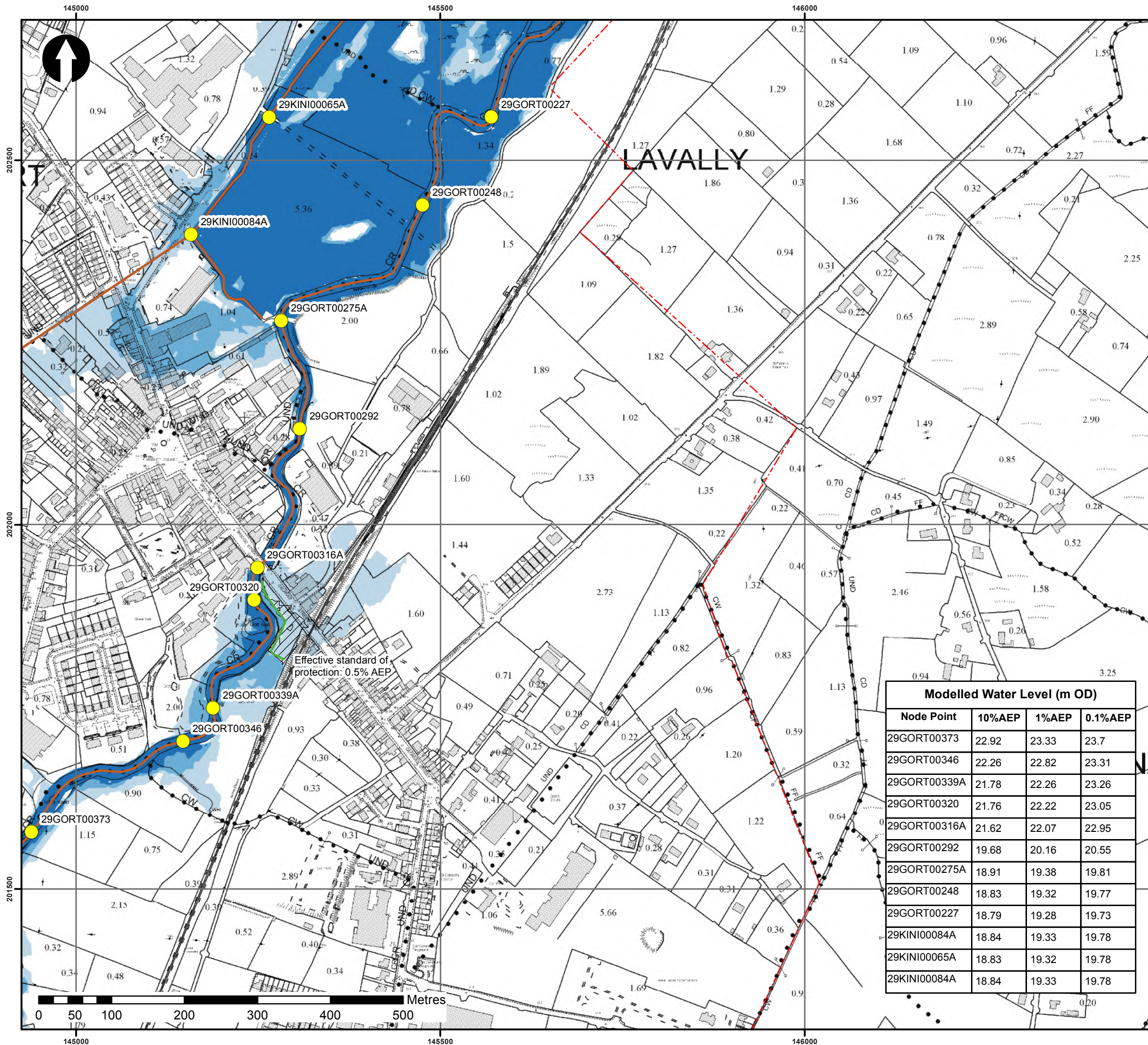
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

The Office of Public Works
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24 Grove Island
Corbally
Limerick, Ireland

**WESTERN
CFRAM
STUDY**
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT

Map: Gort Flood Extent		Final
Map Type: Flood Extent		
Map Area: HPW	Source: Fluvial	Scenario: Current
Drawn by: DR	Date: Oct 2016	Scale: 1:5,000 Original @ A3
Checked by: JC	Date: Oct 2016	
Approved by: SPW	Date: Oct 2016	
Map No: W29GRT_EXFCD_F2_02		Sheet: 2 of 4



Grey squares have no extent shown for this suite of flood maps so no maps have been produced.

- AFA Boundary
 - Defended Area
 - Defence – Embankment
 - Model Nodes
 - Modelled River Centreline
-
- 10% AEP Fluvial Extent
 - 1% AEP Fluvial Extent
 - 0.1% AEP Fluvial Extent

IMPORTANT USER NOTE:
THE FLOWS PRESENTED IN THIS MAP ARE RELEVANT TO THE LOCATION SHOWN ONLY. THEY SHOULD NOT BE USED WITHOUT FIRST REFERRING TO THE HYDRAULIC MODELLING REPORT TO UNDERSTAND THE CONTEXT OF THE HYDROLOGY AT THE SITE.

THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Modelled Water Level (m OD)			
Node Point	10%AEP	1%AEP	0.1%AEP
29GORT00373	22.92	23.33	23.7
29GORT00346	22.26	22.82	23.31
29GORT00339A	21.78	22.26	23.26
29GORT00320	21.76	22.22	23.05
29GORT00316A	21.62	22.07	22.95
29GORT00292	19.68	20.16	20.55
29GORT00275A	18.91	19.38	19.81
29GORT00248	18.83	19.32	19.77
29GORT00227	18.79	19.28	19.73
29KINI00084A	18.84	19.33	19.78
29KINI00065A	18.83	19.32	19.78
29KINI00084A	18.84	19.33	19.78



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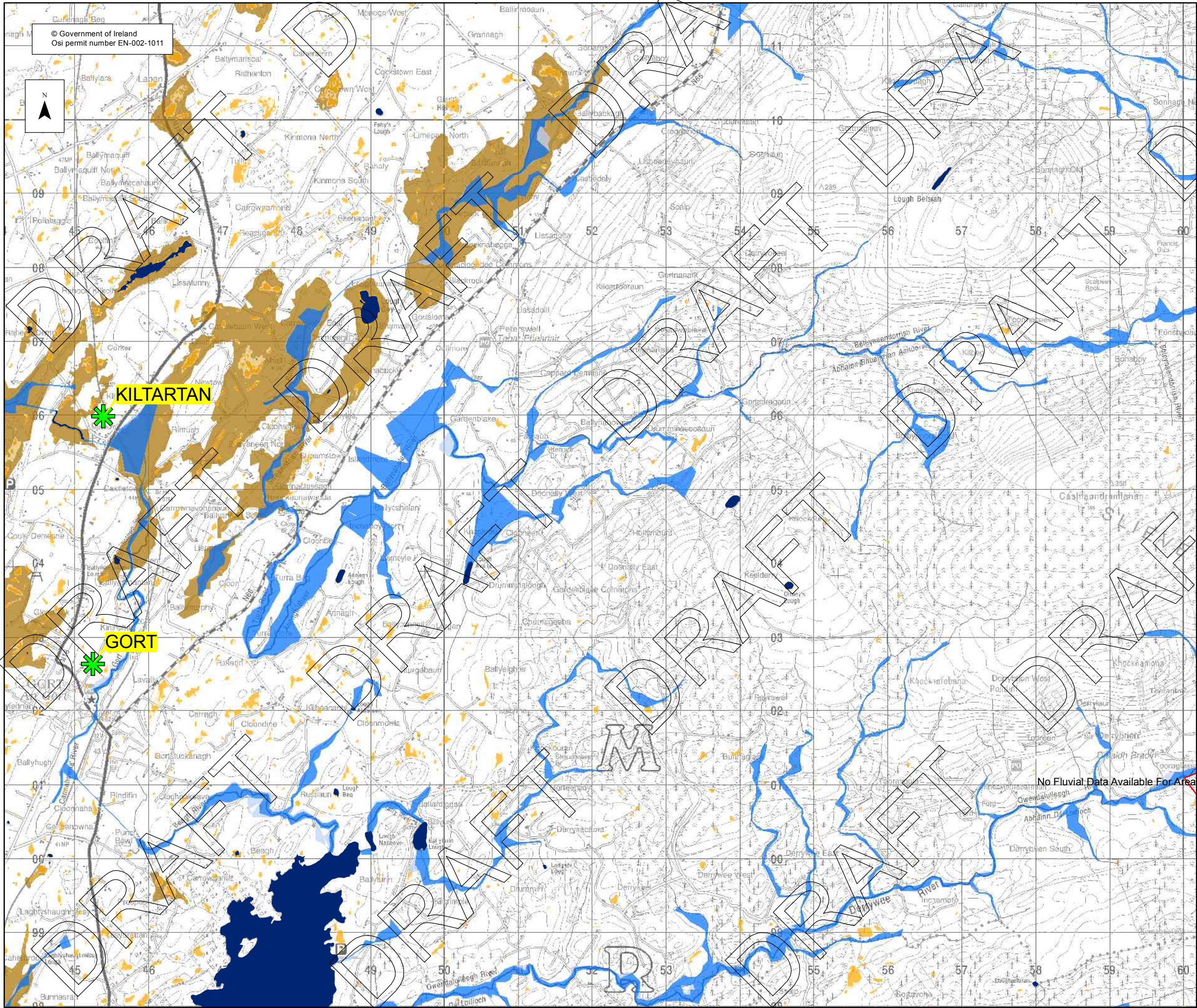


JBA Consulting
24 Grove Island
Corbally
Limerick, Ireland



WESTERN
CFRAM
STUDY
CATCHMENT FLOOD RISK
ASSESSMENT AND MANAGEMENT

Map: Gort Flood Extent		Final	
Map Type: Flood Extent			
Map Area: HPW	Source: Fluvial	Scenario: Current	
Drawn by: DR	Date: Oct 2016	Scale: 1:5,000	
Checked by: JC	Date: Oct 2016		
Approved by: SPW	Date: Oct 2016	Original @ A3	
Map No: W29GRT_EXFCD_F2_03		Sheet: 3 of 4	



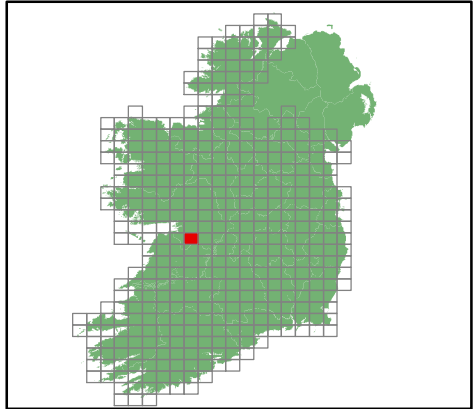
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Osi permit number EN-002-1011



KILTARTAN

GORT

Location Plan :



Legend:

Flood Extents

- Fluvial - Indicative 1% AEP (100-yr) Event
- Fluvial - Extreme Event
- Coastal - Indicative 0.5% AEP (200-yr) Event
- Coastal - Extreme Event
- Pluvial - Indicative 1% AEP (100-yr) Event
- Pluvial - Extreme Event
- Groundwater Flood Extents

Lakes / Turloughs

PFRA Outcomes

- Probable Area for Further Assesment
- Possible Area for Further Assesment

Important User Note:

The flood extents shown on these maps are based on broad-scale simple analysis and may not be accurate for a specific location. Information on the purpose, development and limitations of these maps is available in the relevant reports (see www.cfram.ie). Users should seek professional advice if they intend to rely on the maps in any way.

If you believe that the maps are inaccurate in some way please forward full details by contacting the OPW (refer to PFRA Information leaflets or 'Have Your Say' on www.cfram.ie).

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Co Meath
Ireland



Project :
PRELIMINARY FLOOD RISK ASSESSMENT (PFRA)

Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW Date : July 2011
Checked By : MA Date : July 2011

Figure No. :
2019 / MAP / 194 / A Revision :
0

Drawing Scale : 1:50,000 Plot Scale : 1:1 @ A3

