PINNACLE
CONSULTING ENGINEERS

edgeconnex

Ballymakaily Data Centre (EDCDUB06)
West of the Newcastle Rd. (R120), Lucan

FLOOD RISK ASSESSMENT

July 2022

P220401

STRUCTURAL • CIVIL • DUE DILIGENCE • ENGINEERING MASTERPLANNING
FLOOD MANAGEMENT • INFRASTRUCTURE DESIGN
PRE-DEVELOPMENT ENGINEERING • BIM • TRANSPORTATION

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APPROVALS

	Name	Signature	Position	Date
Prepared by	S. O'Reilly		Associate	20/07/2022
Reviewed by	J. Mayer		Director	21/07/2022
Approved by	J. Mayer		Director	22/07/2022

REVISIONS

Revision By	Date	Context

VERSIONS

Number	By	Date	Context
1	S. O'Reilly	24/07/2022	Planning Submission

SOURCES OF DATA

Office of Public Works (OPW)	
Met Eireann	
Land Survey Services Ltd.	
Google	

REPORT CONTENTS

Executive Summary

This report was prepared for South Dublin County Council in connection with the planning application for a data centre development and addresses the potential flood risk and mitigation measures proposed for the subject site, located to the south of the Grand Canal and to the west of the Newcastle Road (R120), Co. Dublin.

EdgeConneX Ireland Limited are applying for permission for development at this site of 21.8 hectares (blue line boundary in Figure 1) that is located within the townland of Ballymakaily to the west of the Newcastle Road (R120), Lucan, Co. Dublin.

This planning application will only be for the eastern data centre adjacent to Newcastle Road (R120) known as **EDC DUB06** (red line boundary in Figure 1) and cover an area of 5.14ha, please refer to Figure 1 for the site location and subject planning application.

EdgeConneX Ireland Limited are applying for permission for development at this site of 5.14hectares that is located within the townland of Ballymakaily to the west of the Newcastle Road (R120), Lucan, Co. Dublin.

The development will consist of the construction of two no. adjoined single storey data centres with associated office and service areas with an overall gross floor area of 15,274sqm that will comprise of the following:

- Construction of 2 no. adjoined single storey data centres with a gross floor area of 12,859sqm that will include a single storey goods receiving area / store and single storey office area (2,415sqm) with PV panels above, located to the east of the data centres as well as associated water tower, sprinkler tank, pump house and other services;
- The data centres will also include plant at roof level; with 24 no. standby diesel generators with associated flues (each 25m high) that will be located within a generator yard to the west of the data centres;
- New internal access road and security gates to serve the proposed development that will provide access to 36 no. new car parking spaces (including 4 no. electric and 2 no. disabled spaces) and sheltered bicycle parking to serve the new data centres;
- New attenuation ponds to the north of the proposed data centres; and
- Green walls are proposed to the south and east that will enclose the water tower and pump house compound.

The development will also include ancillary site works, connections to existing infrastructural services as well as fencing and signage. The development will include minor modifications to the permitted landscaping to the west of the site as granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 and Ref. SD21A/0042. The site will remain enclosed by landscaping to all boundaries. The development will be accessed off the R120 via the permitted access granted under SDCC Planning Ref. SD19A/0042 / ABP Ref. PL06S.305948 and SD21A/0042.

The report should be read in conjunction with our engineering planning drawings, and deals with existing foul, surface water and water mains present within the surrounding area, and the proposals for the site with regards to these services.

The proposed development is bounded to the north by the Grand Canal; the east by the Newcastle Road (R120); the western and southern boundaries are formed by existing greenfield lands.

The document should be read in conjunction with all associated Planning Drawings and Reports.

1 Introduction

The applicant proposes to construct 2No. adjoined single storey data centres and associated office areas adjacent and to the west of the Newcastle Road (R120). It is intended to access the proposed development off the existing Newcastle Road (R120) adjacent to the eastern boundary of the site. The purpose of this report is to address any potential flooding aspects of the proposed data centre development, on lands situated to the west of the Newcastle Road (R120), Co. Dublin.

This planning application will only be for the eastern data centre adjacent to Newcastle Road (R120) known as **EDC DUB06** (red line boundary in Figure 1) and cover an area of 5.14ha, please refer to Figure 1 below for the site location and subject planning application.

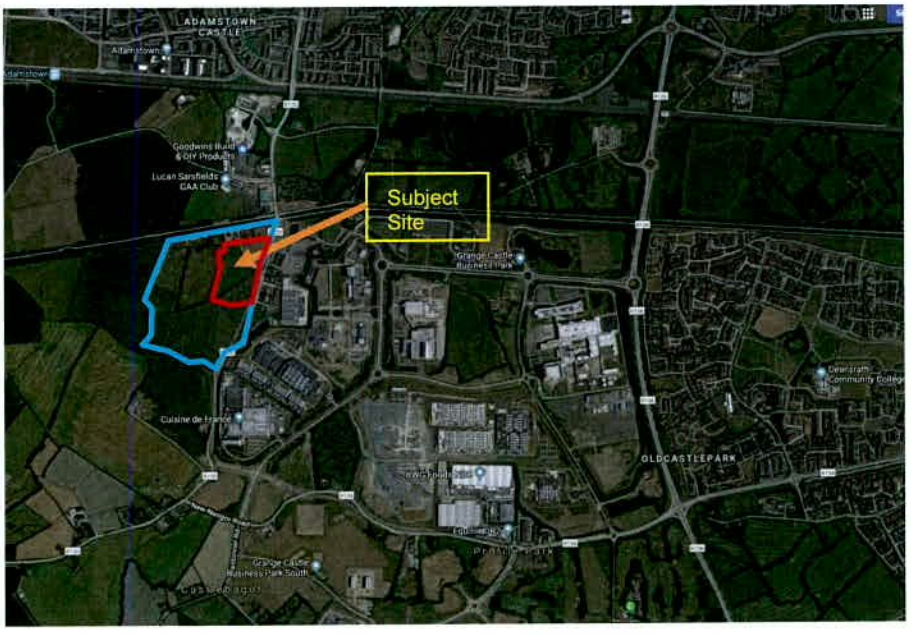


FIGURE1 - Site Location (Source Google Maps)

2 Flood Risk Assessment

The Planning System & Flood Risk Management Guidelines for Planning Authorities, dated November 2009, as published by the OPW, sets out the process to be followed in assessing proposed developments relating to flood risk.

These guidelines introduce comprehensive mechanisms incorporating flood risk identification, assessment and management into the planning process.

Planning authorities, in implementing these guidelines, are to ensure that where relevant, flood risk is a key consideration in the preparation of development and local area plans and also in the assessment of planning applications.

The guidelines will also serve to assist county and local authorities in preparing planning guidelines which should be utilised by developers and the general public in assessing flood risk when submitting development proposals / planning applications. Flood risk is summarised through various levels of the planning system in Figure 1.1. below.

Policy Documents / Instruments	Flood Risk Assessment Technique	Decision-making Tools	Key Chapters
National Spatial Strategy, National Planning Guidelines	Flood Risk Management Guidelines	n/a	1 2
Regional planning guidelines	Regional Flood Risk Appraisal, Catchment Flood Risk Management Plans	Sequential approach, Strategic Environmental Assessment	3 4
City / county development plan	Strategic Flood Risk Assessment, Catchment Flood Risk Management Plans	Sequential approach, dev. plan Justification Test, SEA	3 4
Local area plan	Strategic Flood Risk Assessment	Sequential approach, dev. plan Justification Test, SEA	3 4
Master plan, non-statutory plan, site brief	Site-specific Flood Risk Assessment	Sequential approach, dev. plan Justification Test, SEA / Env. Impact Assessment	3 5
Planning application	Site-specific Flood Risk Assessment	Sequential approach, dev. management Justification Test, EIA	3 5

Fig. 1.1. Flood risk management and the planning system

Using the sequential approach as described in Chapter 3 of the aforementioned guideline document, including confirmation that the site is classified as "Less Vulnerable" and therefore classified as appropriate and in conjunction with assessing available flood data, i.e. OPW, PFRA & CFRAMS mapping etc., it has been determined that the site has been categorised as falling into Zone C, (see Flood Zone definitions below), from a flooding perspective. It is proposed to apply the Source-Pathway-Receptor Model in providing the necessary mitigating measures.

Flood zones

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 these 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.

Fig. 2.3: Indicative flood zone map extract

3 Source-Pathway-Receptor Model

In assessing the potential flood risk to the site, the above model, as described in The Planning System & Flood Risk Management Guidelines for Planning Authorities, was used. The following flood sources were considered and necessary mitigating measures proposed, where required:-

- Coastal Flooding
- Fluvial Flooding
- Pluvial Flooding
- Ground Water Flooding

3.1 Coastal Flooding

In considering the risk from coastal flooding, it is necessary to relate the location of the site relative to the coast and the associated height above sea level. The subject site is located circa 16km from the nearest point on the Irish coast (Dublin Bay) and the average elevation of the site above sea level is circa 65.18m O.D. Malin Head.

Further to the above, coastal flooding is not considered a risk to the subject site.

3.2 Fluvial Flooding

Fluvial flooding is defined as flooding from a river or other watercourse. Further to site inspections and topographical surveys, there are no rivers flowing through the site. The nearest stream in the proximity of the site, is the Griffeen River, circa 500m from the mid-point of the eastern boundary of the site and on the opposite side of the Newcastle Road (R120). The Griffeen River then crosses beneath the Grand Canal to the north-east of the site.

Further to the above, the records of fluvial flooding on the site or environs, i.e. 0.1% AEP Extreme Event (1:1000yr), as indicated on the attached CFRAMS Mapping, i.e. E09BAL_EXFD_F0_10 (refer Appendix B), confirm that there are no locations of Pluvial Flooding indicated on the subject site.

In addition, the 1:1000yr flood level at the above location, is indicated as being at 59.81m OD, which is 5.37m lower than the Finished Floor Level of the nearest proposed data hall facility, i.e. 65.18m, which is located circa 750m to the south-west.

3.3 Pluvial Flooding

This type of flooding is applicable to all sites and is caused by summer thunderstorms or high intensity rainfall during longer duration events. This flooding is then generated by overland flows prior to the run-off entering watercourses / sewers (pipe networks).

As indicated on the attached PFRA Mapping, i.e. 2019 / MAP / 237 / A (refer Appendix C), there are no locations of Pluvial Flooding indicated on the subject site.

Further to the above, any future occurrence of this form of flooding taking place, will be mitigated by the fact that the proposed development has been designed in accordance with the relevant guidelines and specifications of the time, with a surface water attenuation pond / wetland area and below ground attenuation structures being provided, together with a hydrobrake flow control mechanism, limiting the outflow to the Q-bar run-off rate of 6.6l/s.

These measures have been utilised in the sites overall network drainage system in order to mitigate pluvial flooding and provide for a wholly sustainable development.

3.4 Ground Water Flooding

This form of flooding is not considered to be of any risk to the site. This is borne out by the fact that trial holes had previously been dug on the site and the results gathered from this excavation work have indicated that minimal groundwater was encountered.

Additionally, the OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that ground water flooding is largely confined to the West Coast of Ireland, due to the hydrogeology of the area.

Refer Appendix D for the Groundwater Flood Hazard map, clearly indicating that ground water flooding is not considered a risk in this area of County Dublin.

4 Impact on Downstream Network

There are no impacts on the downstream network based on the following:-

- The site has been sustainably managed in accordance with the relevant guidelines and specifications of the time
- SuDS measures have been incorporated in the form of a surface water attenuation pond / wetland area and permeable paving
- Surface water attenuation has been provided and sized based on a Q-bar run-off rate of 6.6l/s
- A Hydrobrake mechanism has been installed to restrict the outflow into the existing network accordingly, i.e. 6.6l/s
- Water quality is maintained as the outflow passes through approved Petrol / Oil Interceptors

The above methods will ensure that all surface water on-site will be sustainably managed and discharged off-site via approved run-off rates into the Local Authority sewer network.

5 Conclusion

In conclusion, the proposed development of the site will be carried out in a wholly sustainable manner, as described and will not pose any flooding issues. This holds true for the developable site itself or for any lands / properties downstream of the proposed development.

The site will be positively drained and surface water will be contained within the overall sites drainage network and managed in a sustainable manner, in accordance with all relevant guidelines and specifications.

Further to the above, based on the indicative flood mapping, the development site is located within Flood Zone C "Low Probability". Additionally, as mentioned, the site is classified as "Less Vulnerable" and therefore the development is classified as appropriate.

Appendix A

OPW - National Flood Hazard Mapping

OPW *National Flood Hazard Mapping*

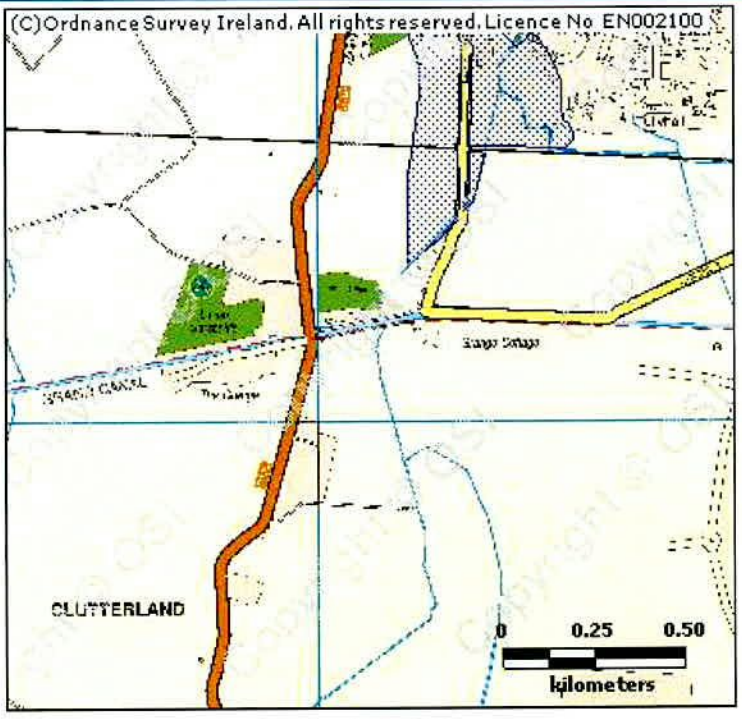
Summary Local Area Report

This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Dublin

NGR: O 031 321



Map Scale 1:20,917

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Thier purpose and scope is explained in the Glossary.

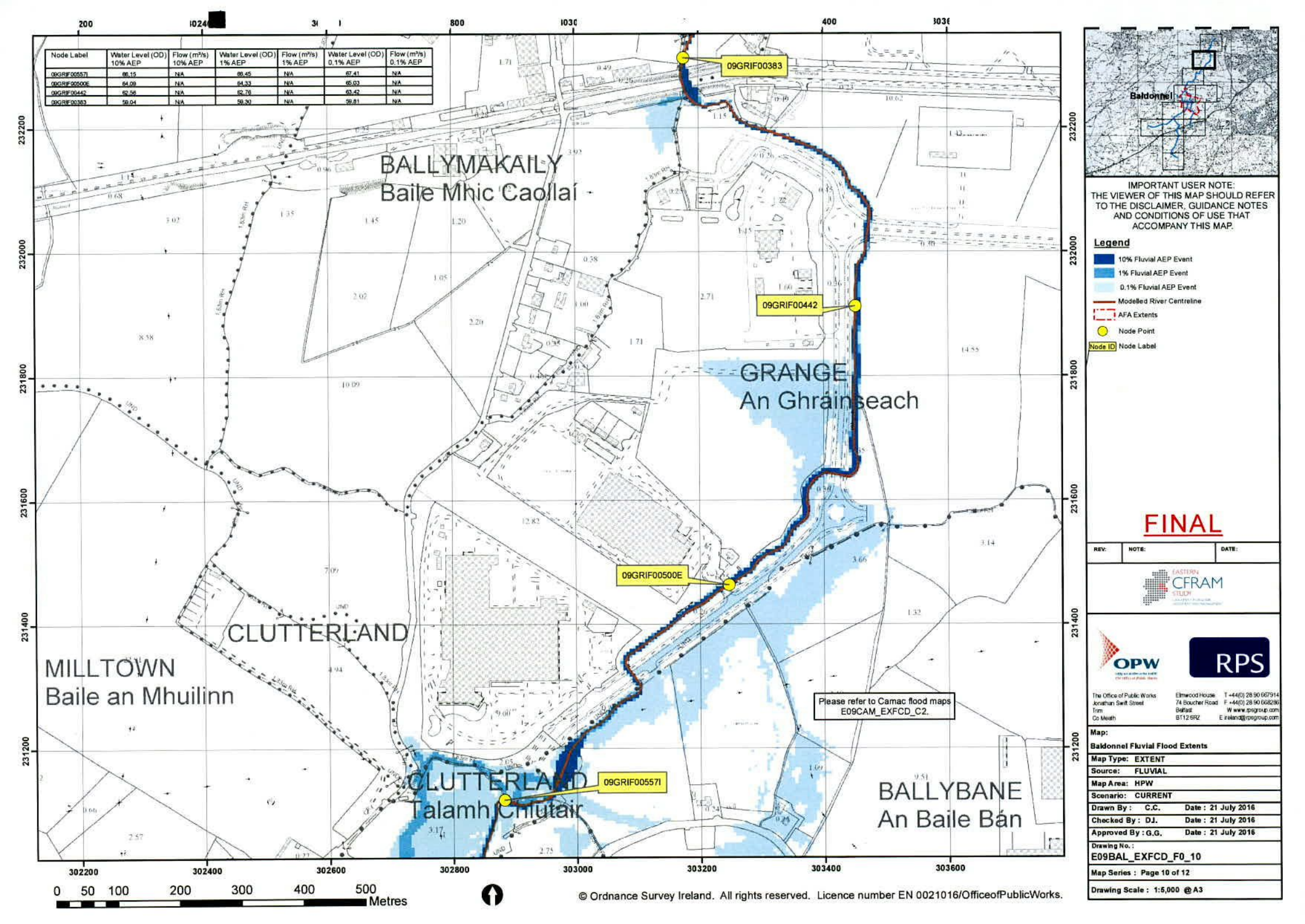
2 Results

1. Griffeen November 2000
Start Date: 05/Nov/2000
County: Dublin
Flood Quality Code: 1
Additional Information: Photos (6) Reports (9) Press Archive (6) More Mapped Information

2. Peamount R134 R120 junction Nov 2000
Start Date: 05/Nov/2000
County: Dublin
Flood Quality Code: 3
Additional Information: Reports (1) Press Archive (1) More Mapped Information

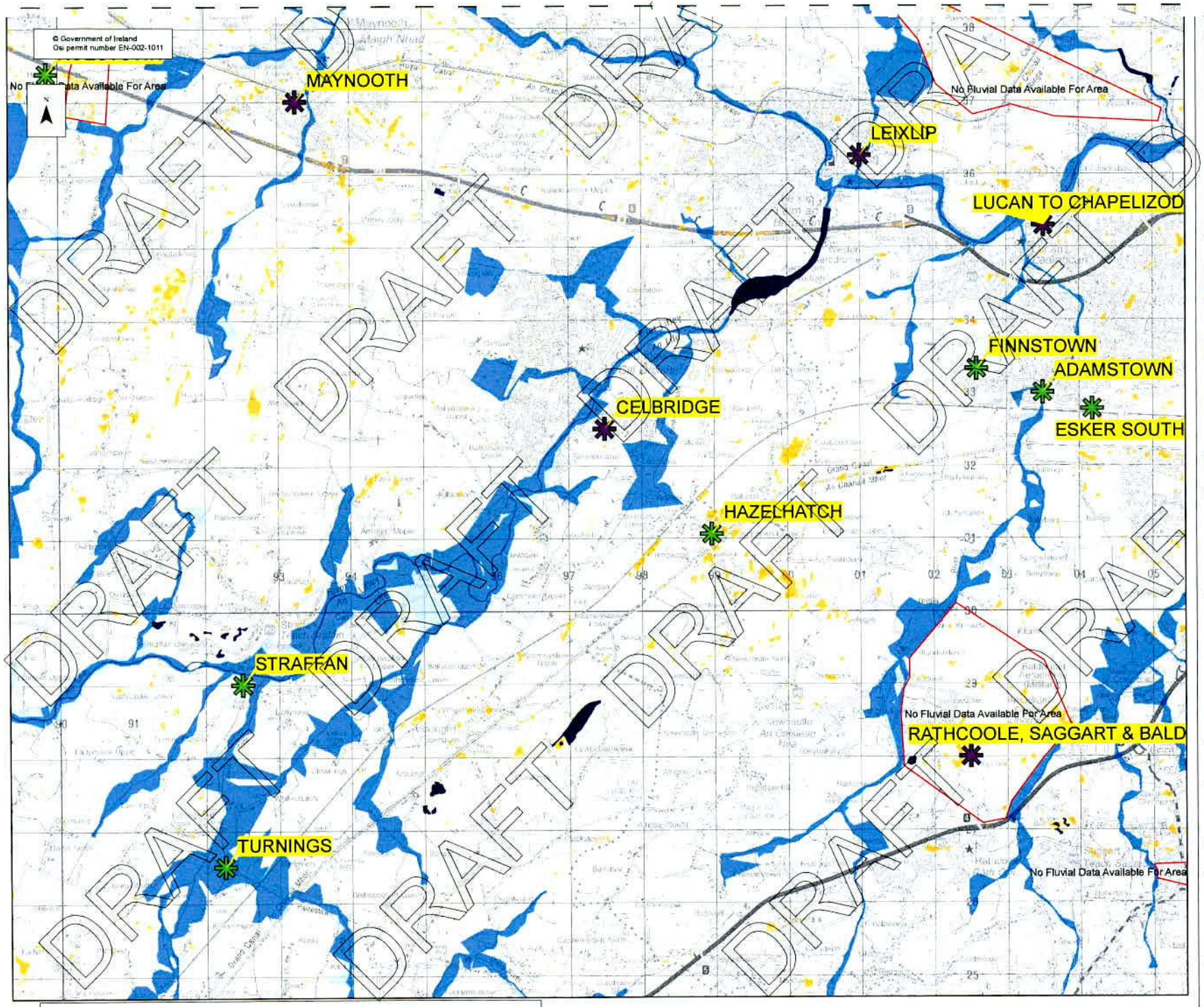
Appendix B

OPW - CFRAMS Mapping



Appendix C

OPW - PFRA Mapping



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).

Office of Public Works
Jonathon Swift Street
Trim
Co Meath
Ireland

OPW

Project :
PRELIMINARY FLOOD RISK ASSESMENT (PFRA)

Map :
PFRA Indicative extents and outcomes
- Draft for Consultation

Figure By : PJW Date : July2011

Checked By : MA Date : July 2011

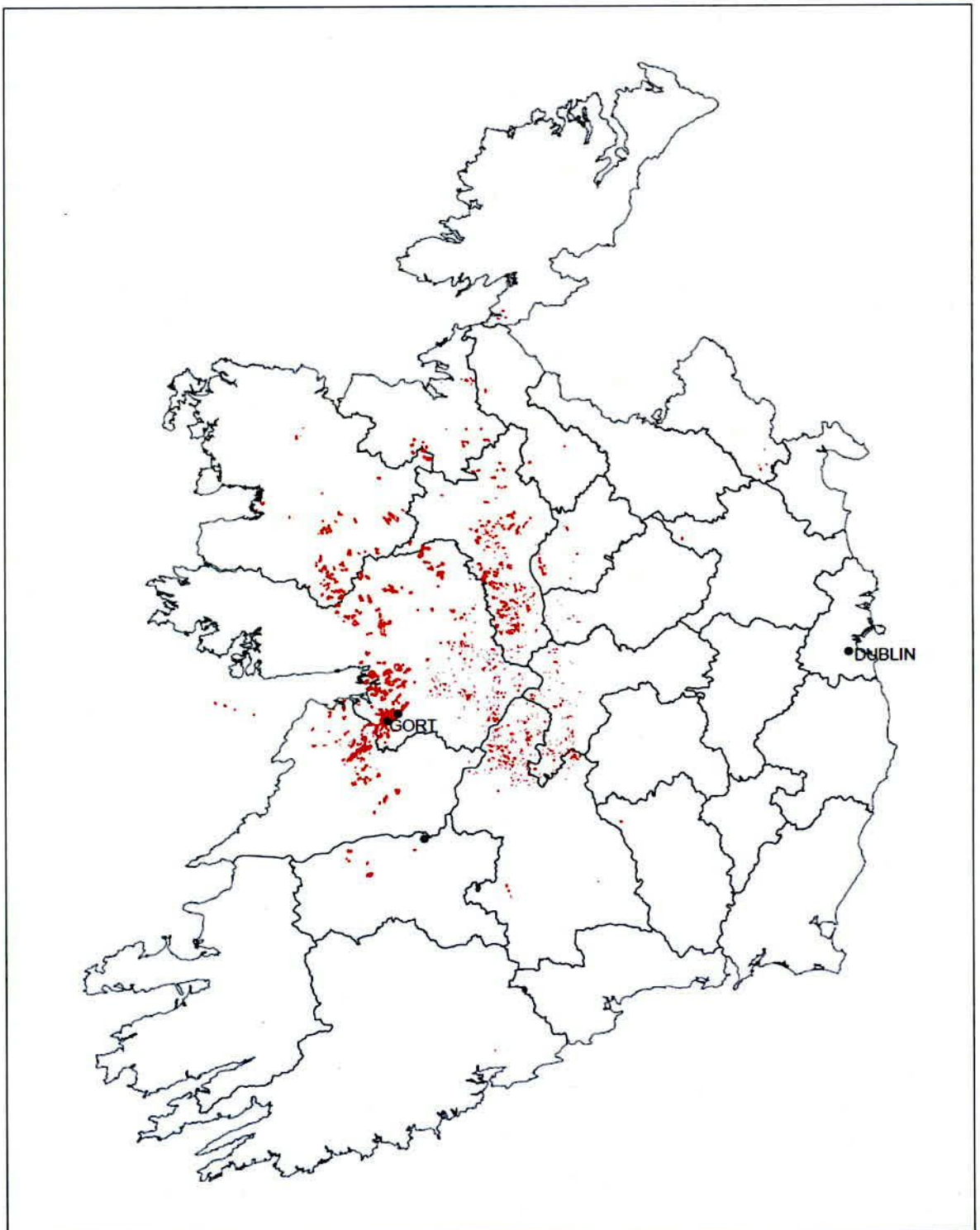
Figure No. : 2019 / MAP / 237 / A

Revision 0

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

Appendix D

OPW – Preliminary Groundwater Flood Hazard Map



Title	Preliminary Groundwater Flood Hazard Map		
Figure 6.6	Size A4	Drawn	RAH
		Checked	SB
Drawing No:	262128BA/2.1	Approved	SB
Date:	24/06/2010	Rev No	01

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Legend

- County boundary
- Location
- Area at risk of groundwater flooding

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