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Flood Risk Assessment

The Arboury

Belgard Road, Tallaght, Dublin 24

Client: Landmarque Belgard Development Company Limited

Job No. L088

May 2022

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FLOOD RISK ASSESSMENT

THE ARBOURY, BELGARD ROAD, TALLAGHT, DUBLIN 24

CONTENTS

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File Location: j:\l_jobs\job-l088\b_documents\l088-csc-zz-xx-rp-c-0004 flood risk assessment.docx

BS 1192 FIELD	**L088-CSC-ZZ-XX-RP-C-0004 Flood Risk Assessment**

Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Rev. No.
L088	MT	DB	PS	01.02.2021	P1
L088	MT	DB	PS	30.03.2021	P2
L088	MT	DB	PS	07.04.2021	P3
L088	MT	DB	PS	27.04.2021	P4
L088	MT	DB	PS	28.04.2021	P5
L088	MT	DB	PS	08.10.2021	P6
L088	MT	DB	PS	25.02.2022	P7
L088	MT	DB	PS	25.03.2022	P8
L088	MT	DB	PS	27.04.2022	P9
L088	MT	DB	PS	12.05.2022	P10

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1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Landmarque Belgard Development Company Limited to prepare an Engineering Services Report to accompany a planning application for a residential and retail development on the site of the ABB Building, Belgard Road, Tallaght, Dublin 24.

In preparing this report, CS Consulting has made reference to the following:

- South Dublin Development Plan 2016-2022 (including Strategic Flood Risk Assessment)
- Draft South Dublin Development Plan 2022-2028
- Greater Dublin regional Code of Practice for Works
- Office of Public Works Flood Maps
- Department of the Environment Flooding Guidelines
- Geological Survey of Ireland Maps
- Local Authority Drainage Records

The Flood Risk Assessment is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, as part of the Planning Submission.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of c.0.898 ha is located at the former ABB Site, Belgard Road, Tallaght, Dublin 24, D24 KD78. The site is bound by Belgard Road (R113) to the east, Belgard Square North to the North and Belgard Square East to the west and Clarity House to the south.

Figure 1 – Site Location
(map data: EPA, NTA, OSM Contributors)

The development is bound by the primary route of Belgard Road and the secondary routes of Belgard Square North & East with active frontage opening onto this route. The physical boundary to the south has a wall separating the site from an adjacent property along which the LAP seeks to introduce a Tertiary route which is proposed as part of this development.

The site is situated at the North East corner of the LAP town centre zoned land; therefore it is a gateway site leading from Belgard Road and Belgard Road North into Tallaght centre.

The location of the proposed development site is shown in Figure 1 above; which also shows the indicative extents of the development site. The site is withing walking distance to the Square shopping centre (250m), the Tallaght University Hospital (400m), TUD Tallaght Campus (50m) and the Luas stop in the town centre (500m)

The site is within 2.5 km of the M50 to the East. The surrounding road network is shown in more detail in Figure 2 below.

Figure 2 – Site Environs
(map data: EPA, NTA, OSM Contributors)

2.2 Existing Land Use

The site currently contains an industrial/office building which is occupied by ABB Limited. It also contains a storage yard with the remaining portion of the site used for carparking. The topography of the site is flat with only localized falls for drainage purposes.

3.0 PROJECT DESCRIPTION

The site of c.0.898 ha is located at the former ABB Site, Belgard Road, Tallaght, Dublin 24, D24 KD78. The site is bound by Belgard Road (R113) to the east, Belgard Square North to the North and Belgard Square East to the west and Clarity House to the south.

The proposed development will consist of:

1. Demolition of all existing structures on site (with a combined gross floor area of c. 3625 sqm)

2. The construction of a mixed-use residential development set out in 3 No. blocks including a podium over a basement, ranging in height from 2 to 13 storeys (with core access above to roof terrace), comprising:

- 334 no. residential units of which 118 No. will be Build to Rent (BTR) residential units, with associated amenities and facilities across the development,

- 4 No. retail/café/restaurant units and 3 no. commercial spaces associated with the 3 no. live-work units (723 sqm combined),

- Childcare facility (144 sq.m.),

- 670 No. bicycle parking spaces including 186 visitor spaces; 117 car parking spaces (including 6 disabled spaces) are provided at ground floor and basement level.

- The overall development has a Gross Floor Area of 29,784 sq.m.

- Two (2) podium residential courtyards and three (3) public accessible pocket parks, two (2) to the North & one (1) to the South.

- Linear Park (as a provision of the Tallaght Town Centre LAP) providing safe public pedestrian and cycling access between Belgard Rd and Belgard Square East

3. Of the total 334 residential units proposed, unit types comprise:

Block A (Build-to-Rent)

- 91 no. 1 bed units
- 1 no. 2 bed 3 person units
- 26 no. 2 bed 4 person units

Blocks B & C

- 2 no. live-work studio units
- 102 no. 1-bed units
- 12 no. 2-bed 3 person units
- 88 no. 2-bed 4 person units including 5 no. duplex units
- 1 no. 2-bed 4 person live-work unit
- 11 no. 3-bed units

4. All associated works, plant, services, utilities, PV panels and site hoarding during construction

4.0 LEVEL OF SERVICE

There is an existing inherent risk of any flood event occurring during any given year. Typically, this likelihood of occurrence was traditionally expressed as a 1-in-100 chance of a 100-year storm event happening in any given year.

A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. Therefore a 1-in-100-year event has a return period of 1% AEP flood event, similarly a 100% AEP can be expressed as a 1-in-1-year event.

The Planning System and Flood Risk management, Guidelines for Planning Authorities set out the best practice standards for flood risk assessment in Ireland. These are summarised in Table 1.0 below.

Table 1: Summary of Level of Service – Flooding Source

Flooding Source	Drainage	River	Tidal/Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible (docks, marinas)	-	>1% AEP	>0.5% AEP

Under these guidelines a proposed development site has first to be assessed to determine the flood zone category it falls under.

IE3 Objective 1 in the SDCC Development Plan is:

To support and co-operate with the Office of Public Works in delivering the Catchment-Based Flood Risk Assessment and Management Programme and in particular the Eastern District CFRAMS and associated Flood Risk

Management Plan (FRMP), the River Dodder CFRAMS and associated Flood Risk Management Plan (FRMP). The recommendations and outputs arising from the CFRAM study for the Eastern District shall be considered in preparing plans and assessing development proposals. It is confirmed that that the development does not impact on the FRMP and River Dodder CFRAMS because of low flooding risk and distance to River Dodder.

It is a requirement of both South Dublin City Councils, *Greater Dublin Strategic Drainage Study*, (DCC 2005) & the Department of the Environment, community & Local Government flooding guidelines, *The Planning System* and *Flood Risk Management*, *Guidelines for Planning Authorities*, that the predicted effects of climate change are incorporated into any proposed design, Table 2.0 below indicates the predicted climate change variations.

Table 2: The predicted climate change variations

Design Category	Predicted Impact of Climate Change
Residential	20% Increase in rainfall
Commercial	20% Increase in flood flow
Water-compatible (docks, marinas)	Minimum finished floor level 4.0m – 4.15m AOD

The following guidelines categorise the risks associated with flooding into three areas, Zone A, B & C. This categorisation is indicated below:

- **Zone A:** High Probability of Flooding. Where the average probability of flooding from rivers and sea is highest (greater than 1% annually or 1 in 100 for river flooding or 0.5% annually or 1 in 200 for coastal flooding).
- **Zone B:** Moderate Probability of Flooding. Where the average probability of flooding from rivers and sea is moderate (risk between 0.1% annually or 1 in 1000 years and 1% annually or 1 in 100 years for

river flooding, and between 0.1% or 1 in 1000 years and 0.5% annually or 1 in 2000 for coastal flooding).

- **Zone C:** Low Probability of Flooding, Where the probability of flooding from rivers and sea is moderate (risk is less than 0.1% annually or 1 in 1000 years for both rivers and coastal flooding).

In accordance with the *Planning Systems and Flood Risk Management Guidelines for Planning Authorities*, dwellings are classified as 'highly vulnerable developments'.

Reviewing the South Dublin County Council flood maps, the subject site is located in Flood Zone C. See Appendix A.

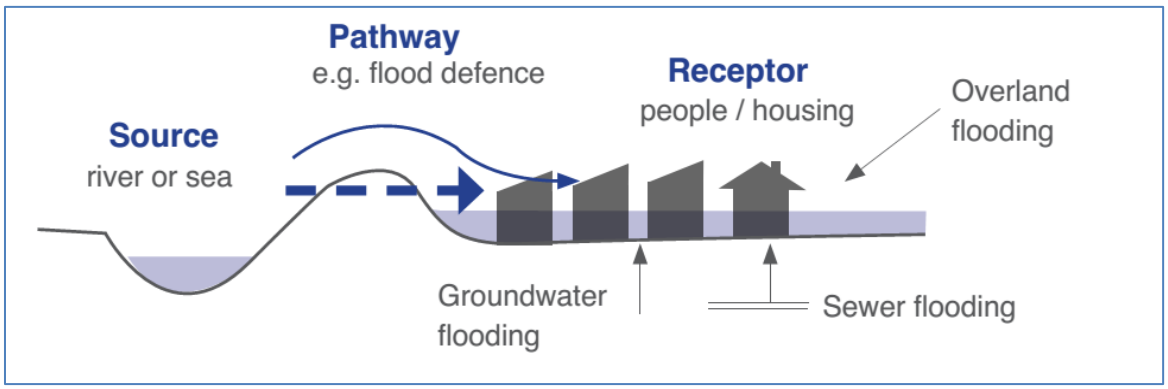

Figure 2: Source-pathway receptor model
(The Planning System and Flood Risk Management Guidelines)

The flooding guidelines have developed an 'appropriateness' matrix for various developments and their potential risk factor. The table indicates if further analysis is required in the form of a justification test. Table 3.0 below outlines the conditions that requires a justification test.

Table 3: Flood Zone Vs. Justification Test Matrix

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water Compatible Development	Appropriate	Appropriate	Appropriate

As noted above the site is located within Flood Zone C, as such justification test is not required.

5.0 FLOOD RISKS & MITIGATION MEASURES

Strategic Flood Risk Assessments were completed for 2016-2022 Development Plan and the draft 2022-2028 and were both reviewed as part of this site-specific flood risk assessment.

5.1 Fluvial Flooding

A review of the EPA maps indicates that the closest watercourse is the Whitestown Stream which connects into the River Poddle south of the Tallaght Bypass, the N81.

A review of the Office of Public Works flood maps database, www.floodmaps.ie, the local area map shows flooding south of the N81 and also on the TUD, Tallaght Campus, see Appendix A. No flooding is shown on the applicant site. This is due to the applicant lands being at an average elevation of approx. 99.5m AOD and rising above the existing areas that are subject to flooding.

From the flood map, the nearest node point to the applicant site is 09PODD01054, approx. 320m north-east of the subject site. and the maximum modelled fluvial floodwater level for the 0.1% AEP (1-in-1000-year event) is approx. 95m AOD. The nearest FFL to this node point and lowest FFL of the scheme is 99.5m AOD, meaning there is freeboard of over 4m provided to the scheme.

Therefore, the risk of fluvial flooding is negligible, and no mitigation measures are required.

5.2 Tidal Flooding

The site's location is such that it is not affected by tidal water bodies and as such tidal flooding is negligible hence no mitigation measures are required.

5.3 Pluvial Flooding

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rain fall. From a review of the OPW Flood maps there is no record of a flood event on the applicant site. This corresponds to Section 4.1; no flooding is shown on the applicant site and hence no mitigation is required.

5.4 Potential for Site to Contribute to Off-Site Flooding.

The proposed development shall require attenuation to be provided. Attenuation shall be sized for a 1 in 100-year extreme storm event increased for the predicated effects of climate change. The attenuation shall release the storm water in a controlled manner after the peak storm duration has passed. By restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated.

Please refer to Engineering Services Report (under separate cover).

5.5 Existing Off-Site Drainage

The subject lands shall only discharge a restricted low flow into the public system thereby reducing the hydraulic pressure on the public network during extreme rainfall events. As well as this, the development site shall be super-elevated above the adjacent lands to the south, due to site topography to prevent the egress of off-site drainage onto the development site. The site is bound by roads on all other sides with road drainage in place to avoid overland flooding onto development site.

5.6 Groundwater Flooding

According to the Geological Survey of Ireland, GSI, interactive maps, https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx, Appendix B, the subject site is underlain with made-ground. The area is listed as overlaying a locally important aquifer which has bedrock which is moderately productive only in local zones. The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is medium. Any basements and sub-terranean areas will be waterproofed with external tanking membranes in accordance with BS8102:2009 to mitigate any risk of ground water ingress.

6.0 CONCLUSION

- The site is in Flood Zone C and therefore no justification test is required.
- There is no river that runs through, or adjacent to the site.
- A review of the Office of Public Works flood maps database shows no flooding on the applicant site, with the nearest flooding being TUD, Tallaght Campus, and south of the N81.
- Predicted flood mapping for pluvial/tidal flood events shall not affect the subject lands.
- The proposed development shall have a storm water attenuation system to address a 1 in 100 -year storm events, increased for predicted climate change values. This shall significantly reduce the volume of storm water leaving the site during storms events which in turn shall have the effect of reducing the pressure on the existing public drainage system.

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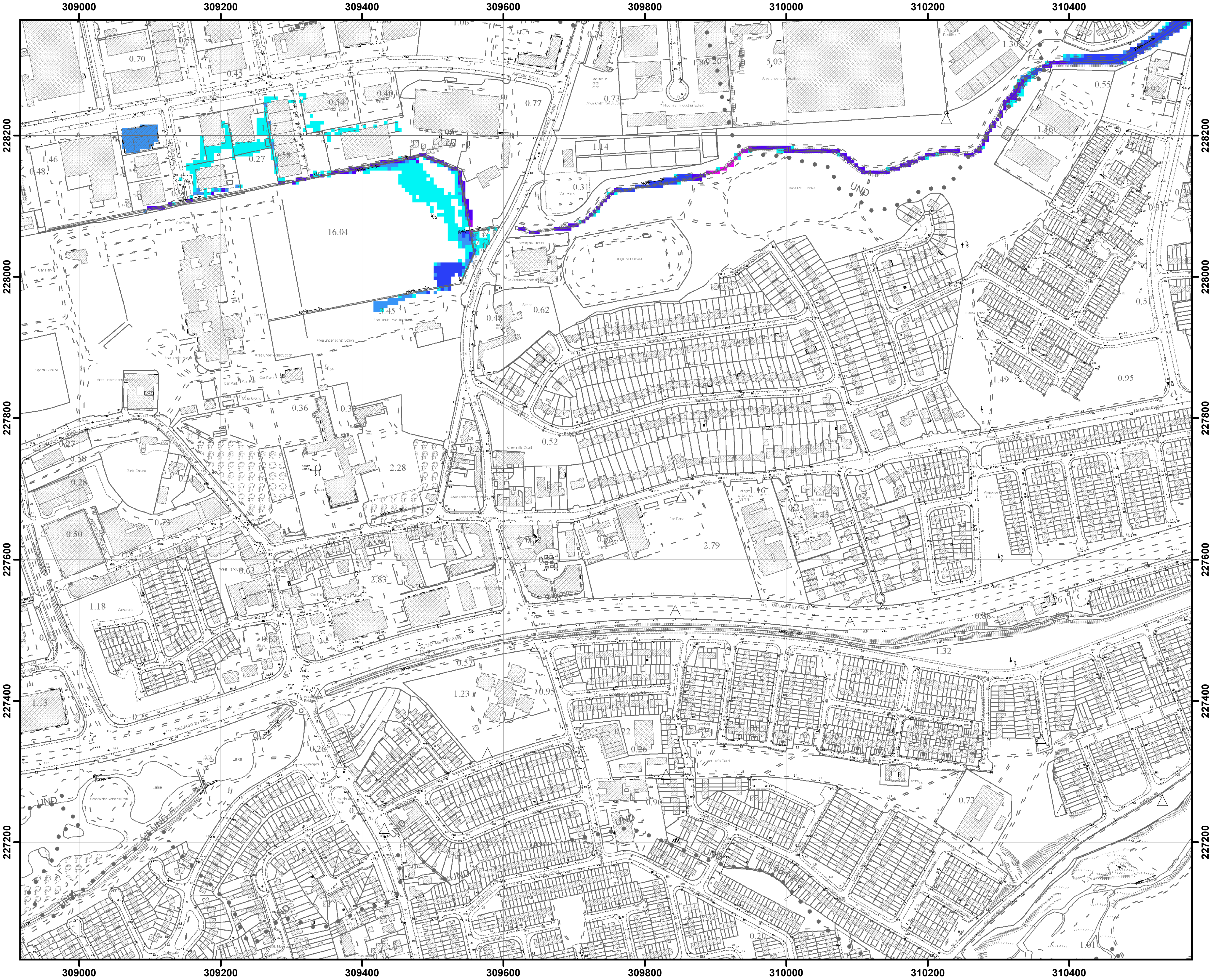
Appendix A: OPW Flood Maps



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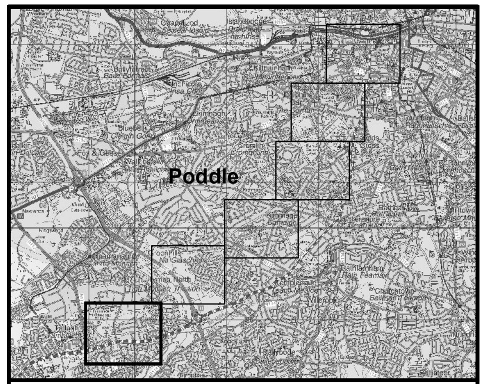

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

Legend

0.1% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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Map:

Poddle River Fluvial Flood Depths

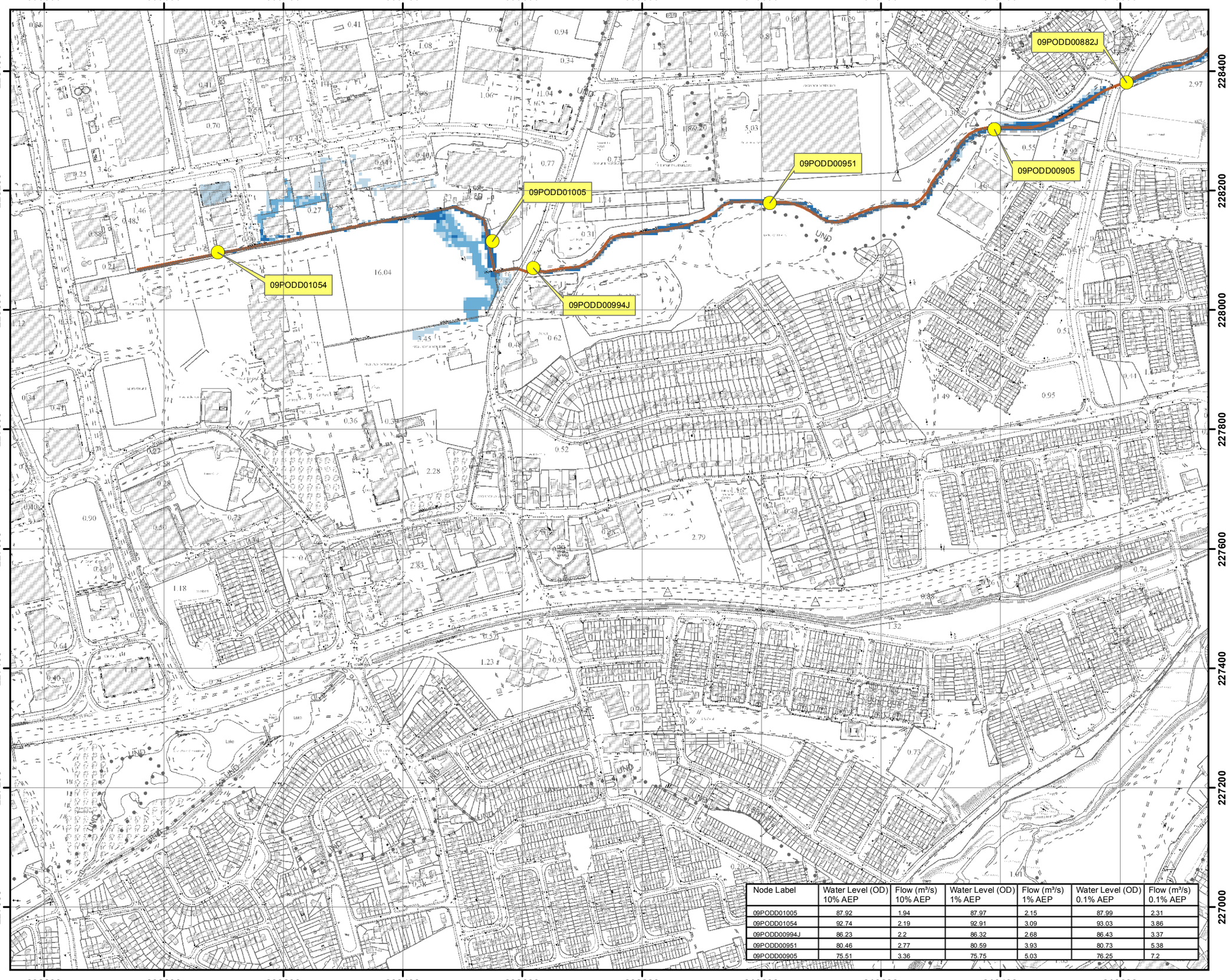
Map Type:	**DEPTH**
Source:	**FLUVIAL**
Map Area:	**HPW**
Scenario:	**CURRENT**
Drawn By : F.M.C.	**Date : 20 October 2016**
Checked By : A.S.	**Date : 20 October 2016**
Approved By : S.P.	**Date : 20 October 2016**

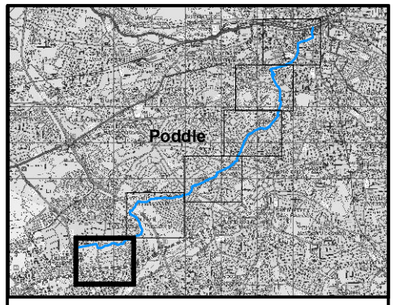
Drawing No. :

E09POD_DPFCD001_F0_01

Map Series : Page 1 of 6

Drawing Scale : 1:5,000 @ A3





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

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
09PODD01005	87.92	1.94	87.97	2.15	87.99	2.31
09PODD01054	92.74	2.19	92.91	3.09	93.03	3.86
09PODD00994J	86.23	2.2	86.32	2.68	86.43	3.37
09PODD00951	80.46	2.77	80.59	3.93	80.73	5.38
09PODD00905	75.51	3.36	75.75	5.03	76.25	7.2

0 60 120 240 360 480 600 Metres

FINAL

REV:	NOTE:	DATE:

EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

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W www.rpsgroup.com
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Map:
Poddle River Fluvial Flood Extents

Map Type:	**EXTENT**		
Source:	**FLUVIAL**		
Map Area:	**HPW**		
Scenario:	**CURRENT**		
Drawn By :	**F.M.C.**	**Date :**	**11 August 2016**
Checked By :	**A.S.**	**Date :**	**11 August 2016**
Approved By :	**S.P.**	**Date :**	**11 August 2016**

Drawing No. :
E09POD_EXFCD_F0_01

Map Series : Page 1 of 6

Drawing Scale : 1:6,050 @A3

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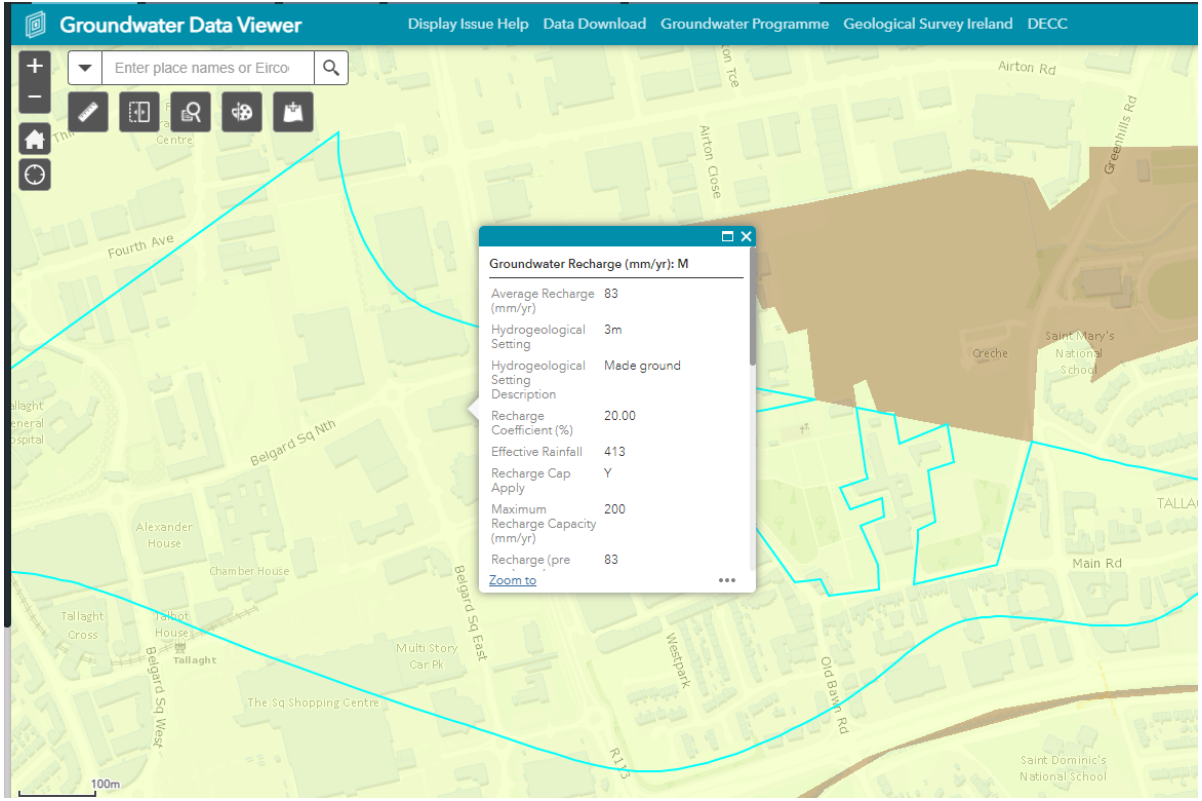
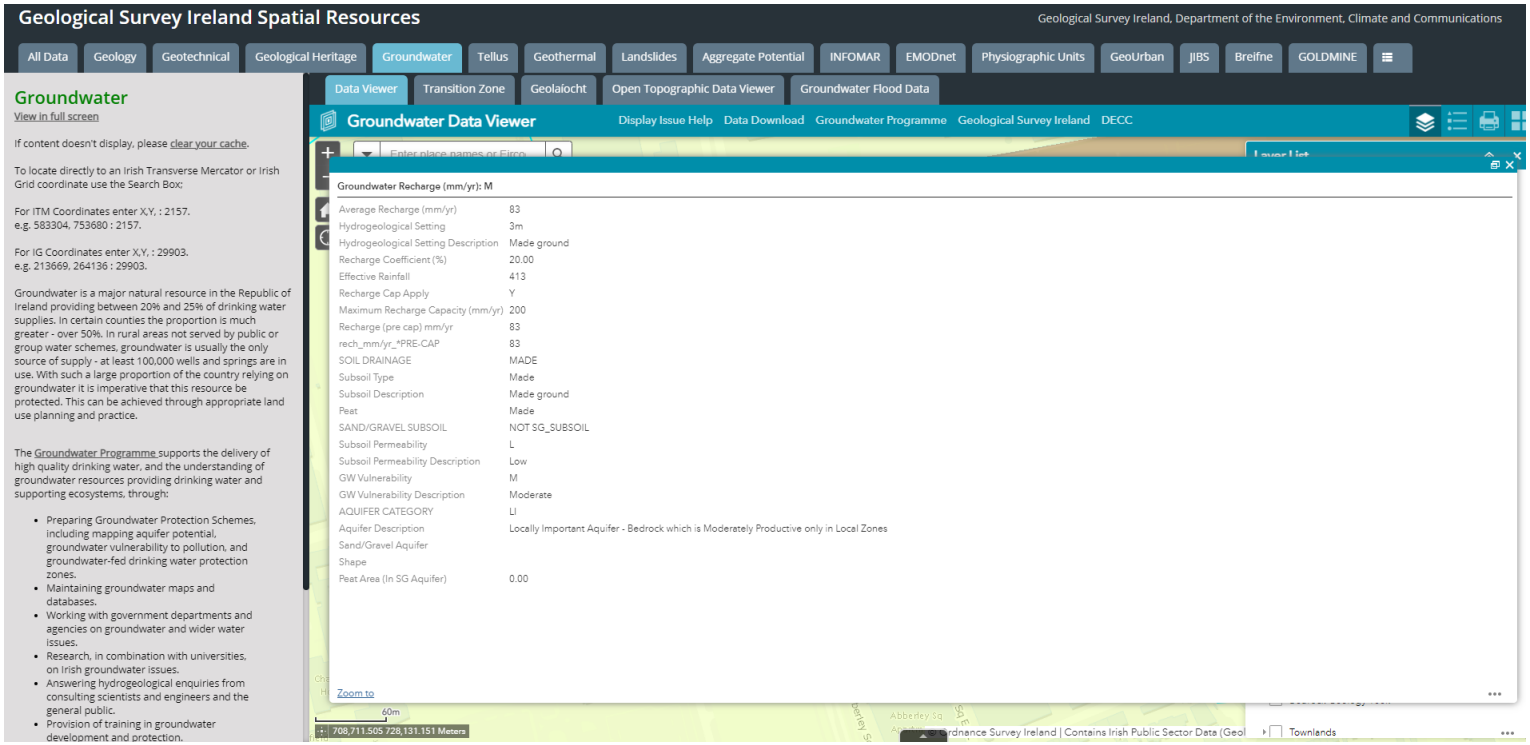
Appendix B: Groundwater Flooding


Groundwater Data Viewer
Display Issue Help
Data Download
Groundwater Programme
Geological Survey Ireland
DECC
Enter place names or Eirco
Groundwater Recharge (mm/yr): M
Average Recharge (mm/yr) 83
Hydrogeological Setting 3m
Hydrogeological Setting Description Made ground
Recharge Coefficient (%) 20.00
Effective Rainfall 413
Recharge Cap Apply Y
Maximum Recharge Capacity (mm/yr) 200
Recharge (pre 83
Zoom to
Airton Rd
Airton Close
Greenhills Rd
Fourth Ave
Belgard Sq Nth
Belgard Sq East
Belgard Sq West
Alexander House
Chamber House
Talbot House
Tallaght Cross
Tallaght
Multi Story Car Pk
The Sq Shopping Centre
Westpark
Old Bawn Rd
Main Rd
Saint Mary's National School
Saint Dominic's National School
Creche
R113
100m


Geological Survey Ireland Spatial Resources
Geological Survey Ireland, Department of the Environment, Climate and Communications
All Data
Geology
Geotechnical
Geological Heritage
Groundwater
Tellus
Geothermal
Landslides
Aggregate Potential
INFOMAR
EMODnet
Physiographic Units
GeoUrban
JIBS
Breifne
GOLDMINE
Groundwater
View in full screen
If content doesn't display, please clear your cache.
To locate directly to an Irish Transverse Mercator or Irish Grid coordinate use the Search Box:
For ITM Coordinates enter X,Y, : 2157.
e.g. 583304, 753680 : 2157.
For IG Coordinates enter X,Y, : 29903.
e.g. 213669, 264136 : 29903.
Groundwater is a major natural resource in the Republic of Ireland providing between 20% and 25% of drinking water supplies. In certain counties the proportion is much greater - over 50%. In rural areas not served by public or group water schemes, groundwater is usually the only source of supply - at least 100,000 wells and springs are in use. With such a large proportion of the country relying on groundwater it is imperative that this resource be protected. This can be achieved through appropriate land use planning and practice.
The Groundwater Programme supports the delivery of high quality drinking water, and the understanding of groundwater resources providing drinking water and supporting ecosystems, through:
Preparing Groundwater Protection Schemes, including mapping aquifer potential, groundwater vulnerability to pollution, and groundwater-fed drinking water protection zones.
Maintaining groundwater maps and databases.
Working with government departments and agencies on groundwater and wider water issues.
Research, in combination with universities, on Irish groundwater issues.
Answering hydrogeological enquiries from consulting scientists and engineers and the general public.
Provision of training in groundwater development and protection.
Data Viewer
Transition Zone
Geolaíocht
Open Topographic Data Viewer
Groundwater Flood Data
Groundwater Data Viewer
Display Issue Help
Data Download
Groundwater Programme
Geological Survey Ireland
DECC
Groundwater Recharge (mm/yr): M
Average Recharge (mm/yr) 83
Hydrogeological Setting 3m
Hydrogeological Setting Description Made ground
Recharge Coefficient (%) 20.00
Effective Rainfall 413
Recharge Cap Apply Y
Maximum Recharge Capacity (mm/yr) 200
Recharge (pre cap) mm/yr 83
rech_mm/yr_*PRE-CAP 83
SOIL DRAINAGE MADE
Subsoil Type Made
Subsoil Description Made ground
Peat Made
SAND/GRAVEL SUBSOIL NOT SG_SUBSOIL
Subsoil Permeability L
Subsoil Permeability Description Low
GW Vulnerability M
GW Vulnerability Description Moderate
AQUIFER CATEGORY LI
Aquifer Description Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
Sand/Gravel Aquifer
Shape
Peat Area (In SG Aquifer) 0.00
Zoom to
60m
708,711.505 728,131.151 Meters
Ordnance Survey Ireland | Contains Irish Public Sector Data (Geol
Townlands

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