

Job No. : 16027  
SHB1-CRA-CS-MOR  
Date: April 2017

## **Kildare County Council**

**Proposed Development of  
74 no. Residential Units at  
Craddockstown Road,  
Craddockstown Demesne,  
Naas, Co. Kildare.**

**Site Specific Flood Risk  
Assessment**



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# Contents Amendment Record



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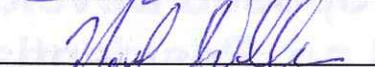
**Title:** Proposed Development of  
 74 no. Residential Units at Craddockstown Road,  
 Craddockstown Demesne, Naas, Co. Kildare. –  
 Site Specific Flood Risk Assessment

**Job Number:** SHB1-CRA-CS-MOR-DOC-Site Specific Flood Risk Assessment

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**Approved By:** Noel Dillon

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## Revision Record

Issue No.	Date	Description	Remark	Prepared	Checked	Approved
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## 1 INTRODUCTION

### 1.1 Introduction

Malone O'Regan have been commissioned to undertake a site-specific flood risk assessment in relation to a proposed residential development on Craddockstown Road, Naas, County Kildare. This report has been prepared to outline the findings of the assessment and to support a Part VIII planning application for the development.

The flood risk assessment has been carried out in accordance with the Government's 2009 Planning System and Flood Risk Management Guidelines (hereafter referred to as the 2009 Planning Guidelines). These guidelines adopt a staged approach to the assessment of flood risk.

This report describes a Stage 2 Initial Flood Risk Assessment which is defined within the 2009 Planning Guidelines as follows:

*“A qualitative or semi-quantitative study to confirm sources of flooding that may affect a plan area or proposed development site, to appraise the adequacy of existing information, to provide a qualitative appraisal of the risk of flooding to development, including the scope of possible mitigation measures, and the potential impact of development on flooding elsewhere, and to determine the need for further detailed assessment.”*

The assessment involved a desk study combined with a site visit. The study was principally focused on examining flooding risks to the proposed site from the nearby Castlesize Stream and Naas Hospital Stream.

This report has also been prepared to satisfy policy SW4 of the Naas Town Development Plan:

*“To ensure that development proposals for lands that are identified in the Naas Town Council Strategic Flood Risk Assessment (Map 8.1) as being located within an area of potential flood risk, are accompanied by a site specific flood risk assessment appropriate to the type and scale of the proposed development.”*

## 2 THE SITE AND PROPOSED DEVELOPMENT

### 2.1 *The Site*

The proposed site is located along the Craddockstown Road (L6043) approximately 1.5km to the southeast of Naas town centre. The site is located at the southern edge of an established residential area. Naas Community National School is located immediately to the north of the site and the Oak Glade residential estate lies to the north of the school. The Ban na Greinne residential development is located to the west of the Craddockstown Road, across from Naas Community National School. 2 no. detached residential properties fronting onto the Craddockstown Road are located to the west of the site. There is further undeveloped, residential zoned land to the north and northeast of the site.

The lands to the south of the site are principally used for agricultural purposes. Craddockstown Golf Course is located to the southeast of the site.

The site has an overall area of 3.58 hectares. A topographical survey has been conducted which indicates that there is a gentle slope across the site. The existing ground level falls from a highest elevation of +118.0m at the southwest corner of the site to a lowest elevation of +112.5m in the northeast corner of the site.

### 2.2 *Surrounding Watercourses*

As illustrated in Figure 2.1 there are no watercourses in the immediate vicinity of the site. The closest watercourses are the Naas Hospital Stream which is approximately 500m to the west of the site and the Castlesize and Craddockstown Demesne Streams which are located approximately 500m to the northeast of the site. The Castlesize Stream and Craddockstown Demesne Stream run alongside the Blessington Road and feed into the Castlesize River at a point approximately 600m to the north of the site.



Figure 2.1 – Surrounding Watercourses

### 2.3 Site Visit

On 2<sup>nd</sup> September 2016 Malone O'Regan visited the proposed site. The purpose of the site visit was to assess the topography of the area and identify potential sources of flood risk. It was noted that there is a significant level difference between the subject site and the adjoining Naas Community National School with the school at a lower elevation.

The site is split into four fields which are separated by mature trees and hedgerows. The majority of the proposed development will be located on the two fields at the western side of the site. Standing water was noted in an area of the north eastern field. This area is roughly 150m to the east of the proposed development.

### 2.4 Proposed Development

The proposed development includes the construction of 74 residential properties as well as access roads, car parking bays and other ancillary utility services. Details of the proposed development are indicated on Malone O'Regan drawing SHB1-CRA-CS-MOR-DR-101.

### 3 FLUVIAL FLOOD RISK ASSESSMENT

The following sources of information were reviewed in order to identify any flood risk to the proposed development site as a result of fluvial flooding:

- The National Preliminary Flood Risk Assessment (PFRA) – Overview Report & Indicative Flood Maps (OPW, March 2012, [www.cfram.ie](http://www.cfram.ie))
- OPW Flood Records from [www.floodmaps.ie](http://www.floodmaps.ie)
- Naas Town Development Plan 2011-2017.

#### 3.1 *The National Preliminary Flood Risk Assessment*

The principal source of information used to establish the risk of flooding on the site is the Flood Risk Assessment (FRA) Maps from the Catchment Flood Risk Assessment and Management (CFRAM) Study. The relevant maps have been included within Appendix A of this report and extract from the maps are provided in the Figures below. Figure 3.1 indicates the extent of flooding associated with the Castlesize Stream while Figure 3.2 shows the predicted flood extents for the Naas Hospital Stream. These maps indicate the extent of flooding caused by a fluvial flood event with an annual exceedance probability (AEP) of 10% (10yr event), 1% (100yr event) and 0.1% (1000yr event). The final versions of the maps were published recently (September 2016) and are considered to be an accurate indication of the risk of flooding on the site.

From Figure 3.1, Figure 3.2 and the maps in Appendix A it can be seen that the site is predicted to remain unaffected by even the largest 1000-year storm events. Flooding is limited to the areas immediately alongside the Castlesize Stream and the Naas Hospital Stream. It can therefore be concluded that there is no realistic risk of fluvial flooding to the site.

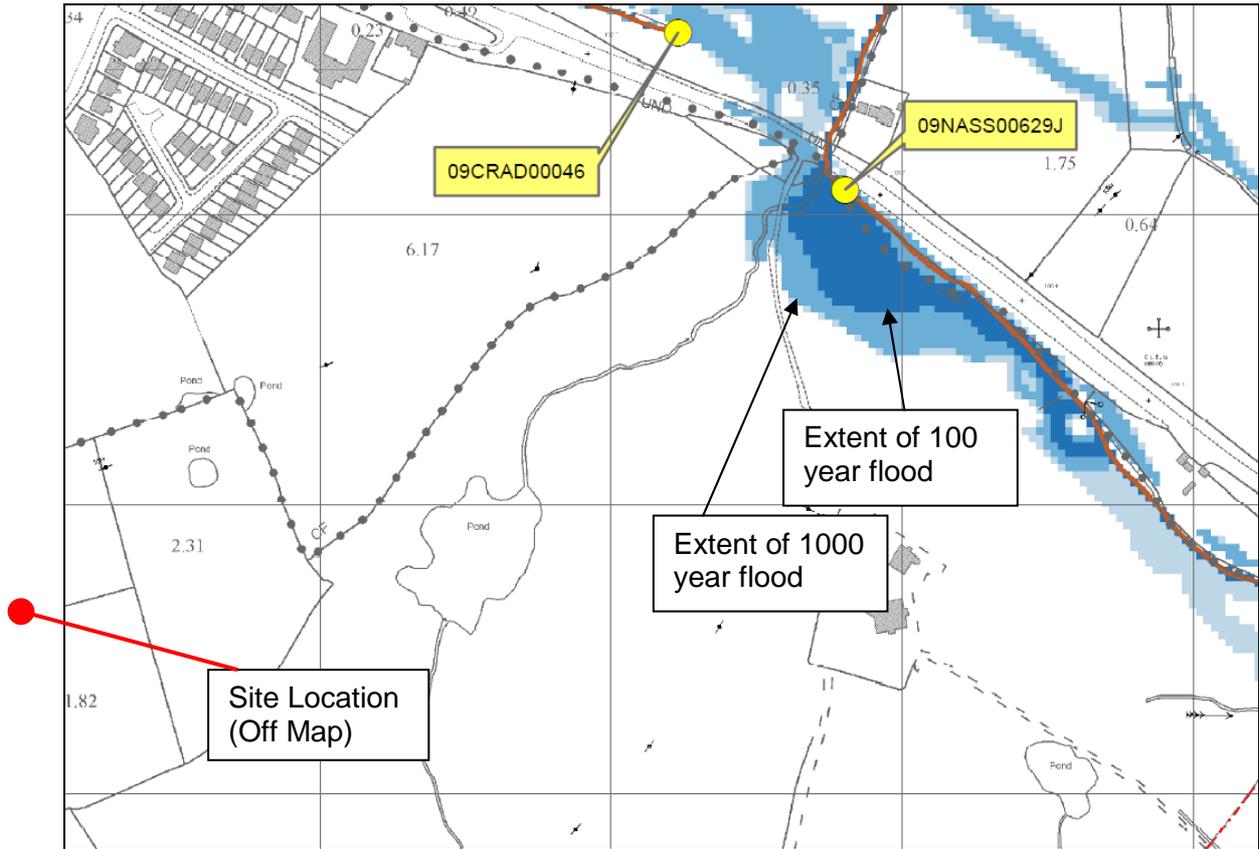


Figure 3.1 – Extract from PFRA Maps – Castlesize Stream

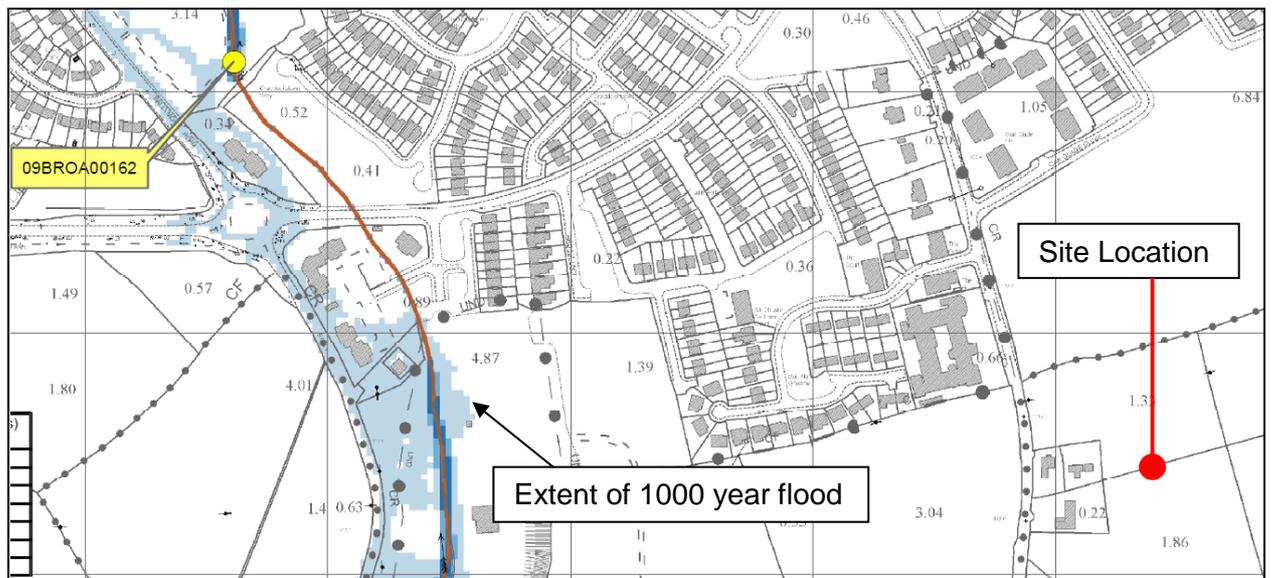


Figure 3.2 – Extract from PFRA Maps – Naas Hospital Stream

The CFRAM Study also gives predicted water levels in the Castlesize Stream and the Naas Hospital Stream. These levels are presented in Table 3.1 below, where all levels are in metres above ordnance datum. The location of the node points is indicated in Figure 3.1 and on the drawings in Appendix A.

Location	Node Label	Water Level 10% AEP	Water Level 1% AEP	Water Level 0.1% AEP
Castlesize Stream	09NASS00629J	102.36	103.22	103.35
Naas Hospital Stream	09BROA00162	98.00	98.32	98.43

*Table 3.1 – CFRAMS Predicted Water Levels*

It can be seen that the flood levels predicted within the CFRAM Study for both the Castlesize Stream and the Naas Hospital Stream are significantly below the minimum ground level within the proposed site (+112.5m). It can therefore be concluded that there is no realistic risk of fluvial flooding to the site.

### 3.2 OPW Flood Records

The Office of Public Works (OPW) maintain records of historical flood events in Ireland which are available for inspection on their website ([www.floodmaps.ie](http://www.floodmaps.ie)). These records were examined and there were no recorded instances of historical flooding in the vicinity of the subject site.

### 3.3 Naas Town Development Plan

Map 8.1 of The Naas Town Development Plan 2017-2023 identifies a number of areas where the risk of flooding needs to be considered and any development justified using a site-specific flood risk assessment. This map is provided for reference in Appendix B of this report.

It is noted that the eastern portion of the overall landholding lies within an area for which flooding needs to be considered. The risk of flooding has been assessed in the preceding sections and the flood maps provided within the CFRAM Study show that there is no realistic risk of flooding to the site.

#### 4 SEQUENTIAL APPROACH TO PLANNING

The document “Planning Systems and Flood Risk Management: Guidelines for Planning Authorities November 2009” requires the adoption of a sequential approach to flood risk management when assessing the location for new developments. This approach is a risk-based method to guide development away from areas that have been identified through flood risk assessment as being at risk from flooding. The philosophy used in this approach is outlined in figure 4.1 below.

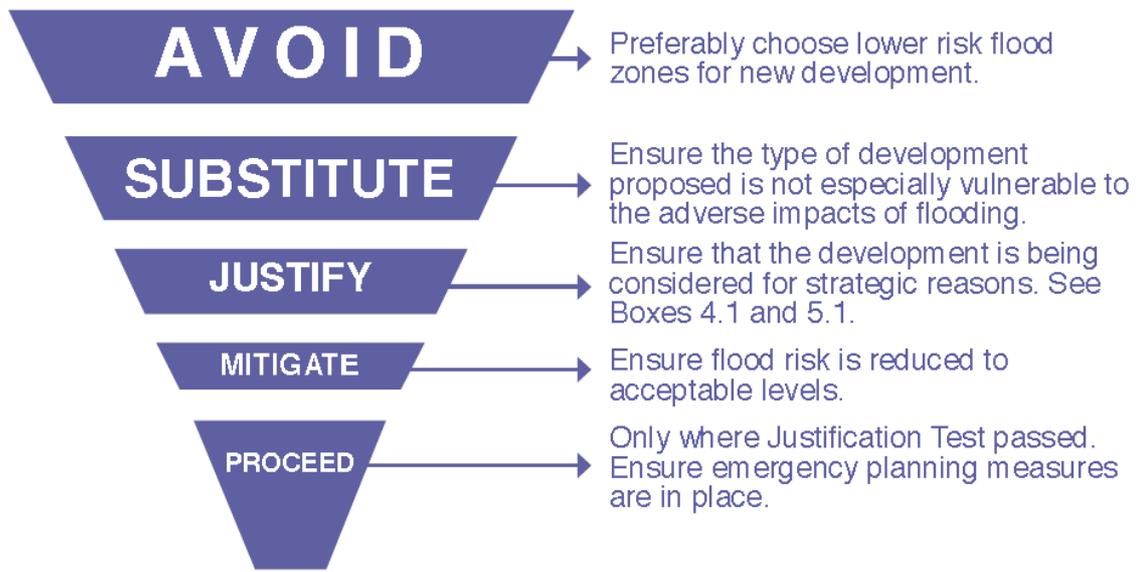


Figure 4.1 Source: *The Planning Systems and Flood Risk Management: Guidelines for Planning Authorities November 2009*

The sequential approach uses mapped flood zones alongside considerations of the vulnerability of different types of development to give priority to development in zones of low flood probability.

##### 4.1 Flood Zones

The flood zones are defined on the basis of flooding from rivers and the sea. The different flood zones recommended in the 2009 Planning Guidelines are:

**Flood Zone A** – Highest risk area where there is a 1% chance of flooding in any one year from rivers and a 0.5% chance of flooding from the sea.

**Flood Zone B** – Moderate risk area where the chance of flooding in any one year is 0.1-1% for rivers and 0.1-0.5% for coastal flooding.

**Flood Zone C** – Low risk area with less than 0.1% chance of flooding from rivers or the sea in any given year.

As described in Section 3.1 above, the PFRA Maps from the CFRAM Study indicate that the proposed development is outside of the area predicted to flood during a 1 in 1000 year flood event. The development is therefore located within Flood Zone C.

#### *4.2 Vulnerability Class of Proposed Development*

The vulnerability class of the development is dependent on the land use and type of development proposed. See Table 4.1 for the vulnerability classes.

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

*Table 4.1 Classification of Vulnerability to Flooding for Various Development Types*

(Source – Table 3.1 Planning System and Flood Risk Management – Guidelines for Planning Authorities DEHLG, OPW, November 2009)

The 2009 Planning Guidelines presents a matrix of vulnerability versus flood zone to illustrate appropriate development and the requirement of justification tests. That matrix can be seen in Table 4.2. The proposed residential development is classified as a highly vulnerable development from Table 4.1. However, the development will be located in Flood Zone C and is therefore considered to be appropriate and a Justification Test is not therefore required.

	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 4.2 - Matrix of Vulnerability vs. Flood Zone*

(Source – Table 3.1 Planning System and Flood Risk Management – Guidelines for Planning Authorities DEHLG, OPW, November 2009)

## **5 OTHER FLOOD SOURCES**

### *5.1 Pluvial Flooding*

This type of flooding is typically 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).

All runoff from the roofs of buildings will be collected into a number of downpipes and gullies and will discharge into the public sewers. External areas will generally be grassed or surfaced using permeable paving. No surface water runoff will be allowed to discharge onto adjoining lands. It is therefore highly unlikely that the site will be affected by pluvial flooding.

### *5.2 Coastal Flooding*

The proposed development is not located in a coastal area and coastal flooding is not considered to be a significant risk.

### *5.3 Groundwater Flooding*

Groundwater flooding occurs as a result of water rising up from underlying soils or from water flowing from abnormal springs. This tends to occur only after long periods of sustained high rainfall.

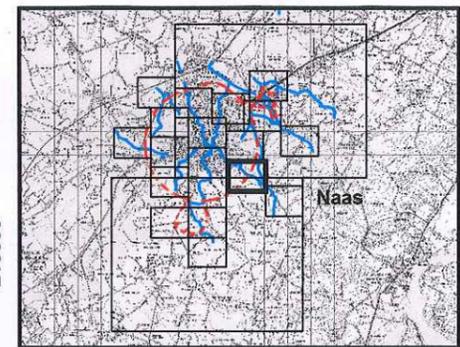
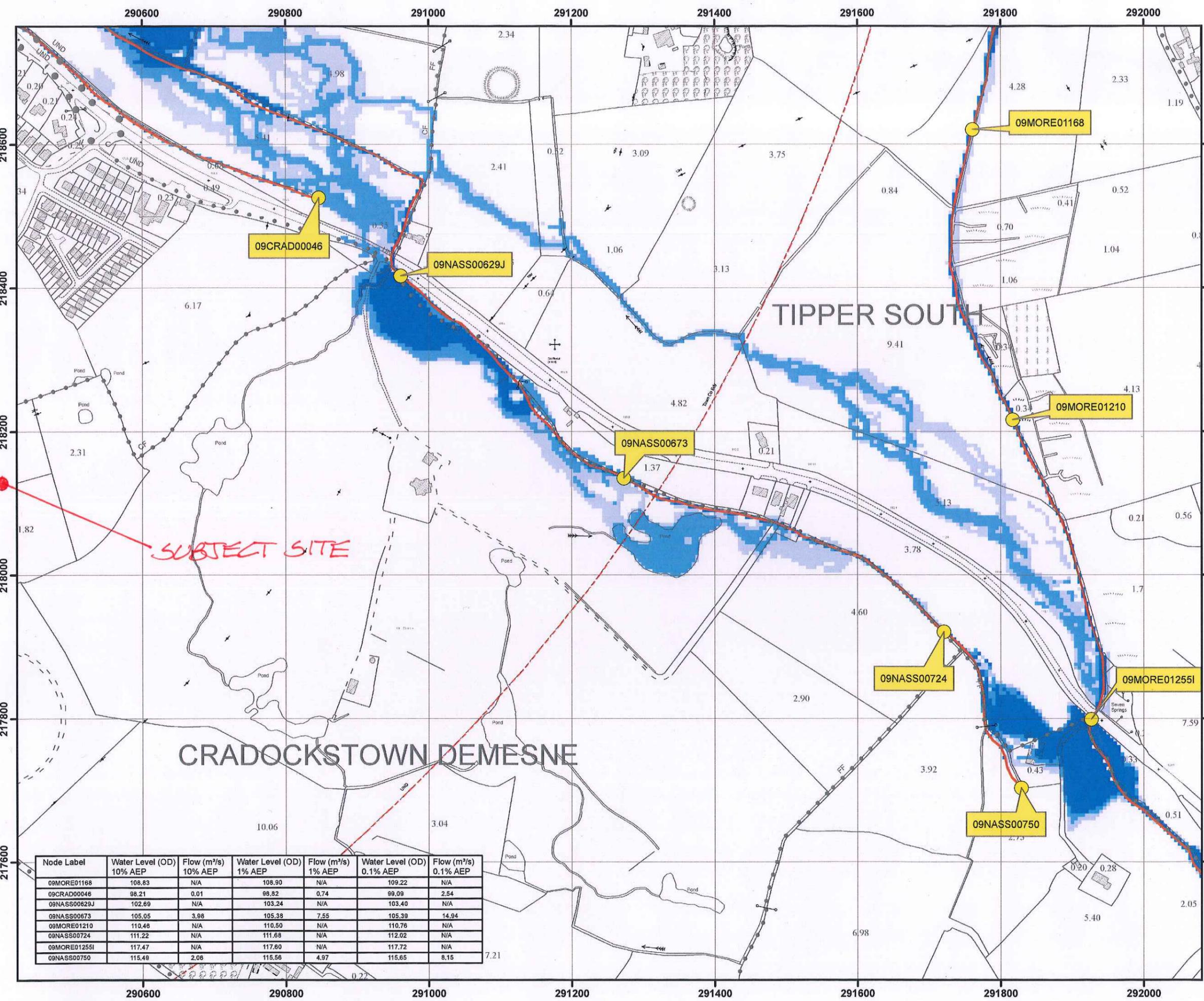
The OPW Preliminary Flood Risk Assessments Groundwater Flooding Report concludes that groundwater flooding is largely confined to the west coast of Ireland, due to the hydrogeology of that area. The site is therefore not considered to be at risk of groundwater flooding.

## 6 CONCLUSIONS FROM FLOOD RISK ASSESSMENT

### 6.1 *Conclusions*

- The eastern edge of the overall landholding is identified within the Naas Town Development Plan as an area for which a site-specific flood risk assessment is required.
- The risk of flooding on the proposed development site has been considered using available primary sources of flooding information. This assessment demonstrates that the entirety of the site is not at risk from flooding from either a 1 in 100yr or a 1 in 1000yr storm event.
- The FRA maps contained within the CFRAM Study show that there is no realistic risk of flooding on the site. The maximum predicted 1000 year flood level within the Castlesize Stream is +103.35m. The maximum predicted 1000 year flood level within the Naas Hospital Stream is +98.43m. The minimum ground level within the proposed development is +112.50m.
- A sequential approach to flood risk management was adopted in accordance with the 2009 Planning Guidelines. After assessing the flooding risk, the proposed residential development is considered to be appropriate in this location.

**APPENDIX A – PFRA MAPS FROM EASTERN CFRAM STUDY**



**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
  - Embankment
  - Wall
  - Defended Area
  - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - 0.1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - Node Point
  - Node ID Node Label

**FINAL**

REV: 01	NOTE: Amendments made to wire grid.	DATE: 20/09/16
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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
09MORE01168	108.83	N/A	108.90	N/A	109.22	N/A
09CRAD00046	98.21	0.01	98.82	0.74	99.09	2.54
09NASS00629J	102.69	N/A	103.24	N/A	103.40	N/A
09NASS00673	105.05	3.98	105.38	7.55	105.39	14.94
09MORE01210	110.46	N/A	110.50	N/A	110.76	N/A
09NASS00724	111.22	N/A	111.68	N/A	112.02	N/A
09MORE01255I	117.47	N/A	117.60	N/A	117.72	N/A
09NASS00750	115.48	2.08	115.58	4.97	115.65	8.15



Map:  
 Naas Fluvial Flood Extents

Map Type: EXTENT

Source: FLUVIAL

Map Area: HPW

Scenario: CURRENT

Drawn By : C.C. Date : 20 September 2016

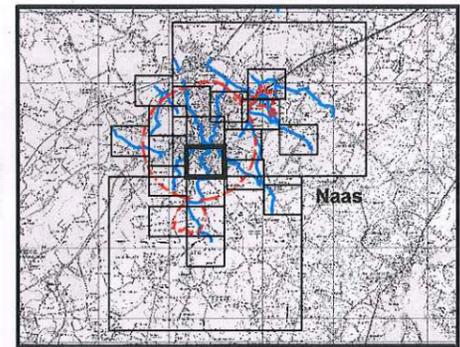
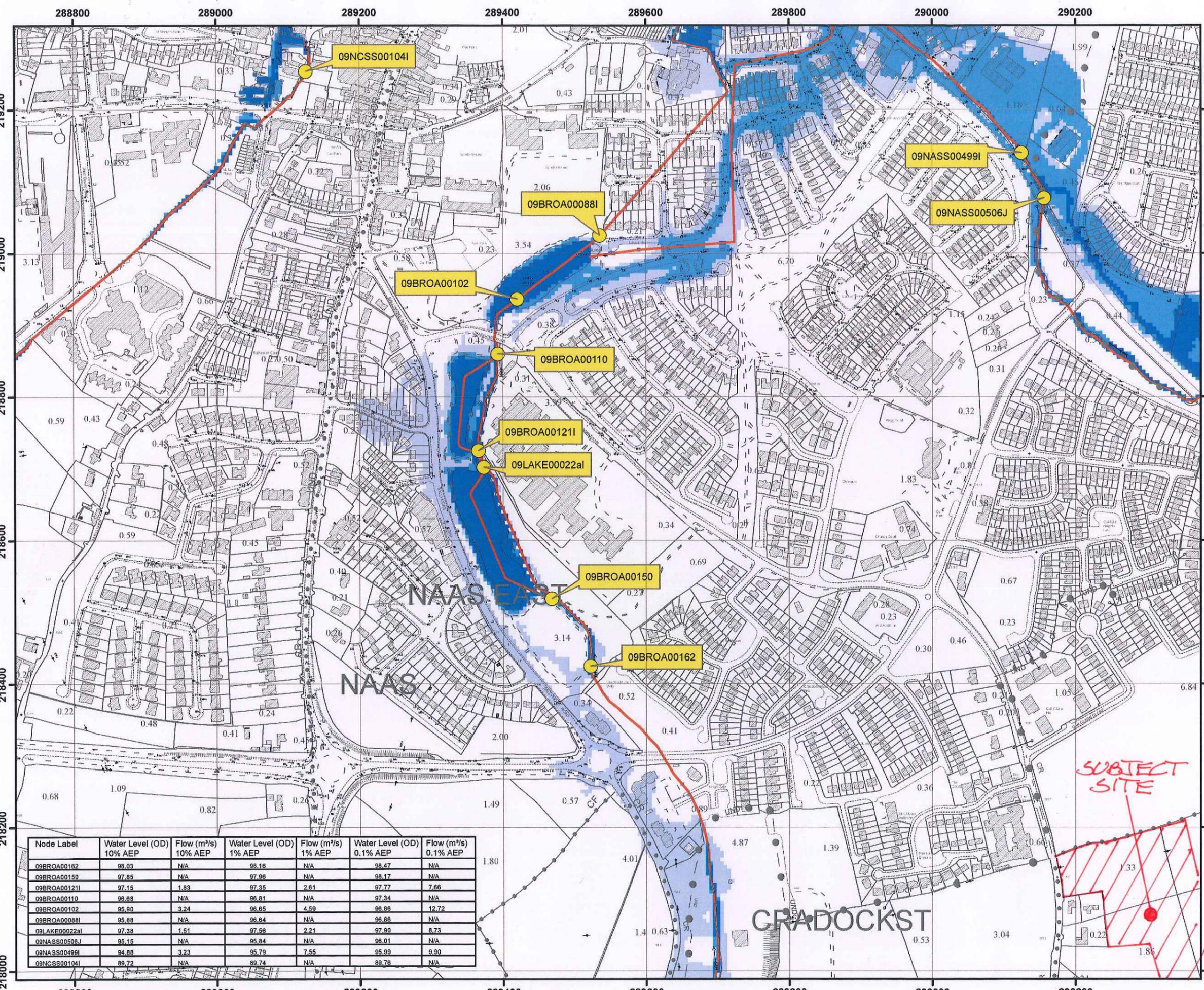
Checked By : T.D. Date : 20 September 2016

Approved By : G.G. Date : 20 September 2016

Drawing No. :  
**E09NAA\_EXFCD\_F1\_16**

Map Series : Page 16 of 21

Drawing Scale : 1:5,000 @ A3



**IMPORTANT USER NOTE:**  
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- Legend**
- 10% Fluvial AEP Event
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  - Modelled River Centreline
  - AFA Extents
  - Embankment
  - Wall
  - Defended Area
  - 1% AEP Standard of Protection of Flood Defence (Walls / Embankments)
  - Node Point
  - Node ID Node Label

**FINAL**

REV: 01	NOTE: Amendments made to wire grid.	DATE: 20/09/16
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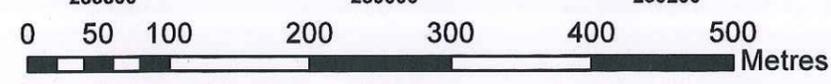
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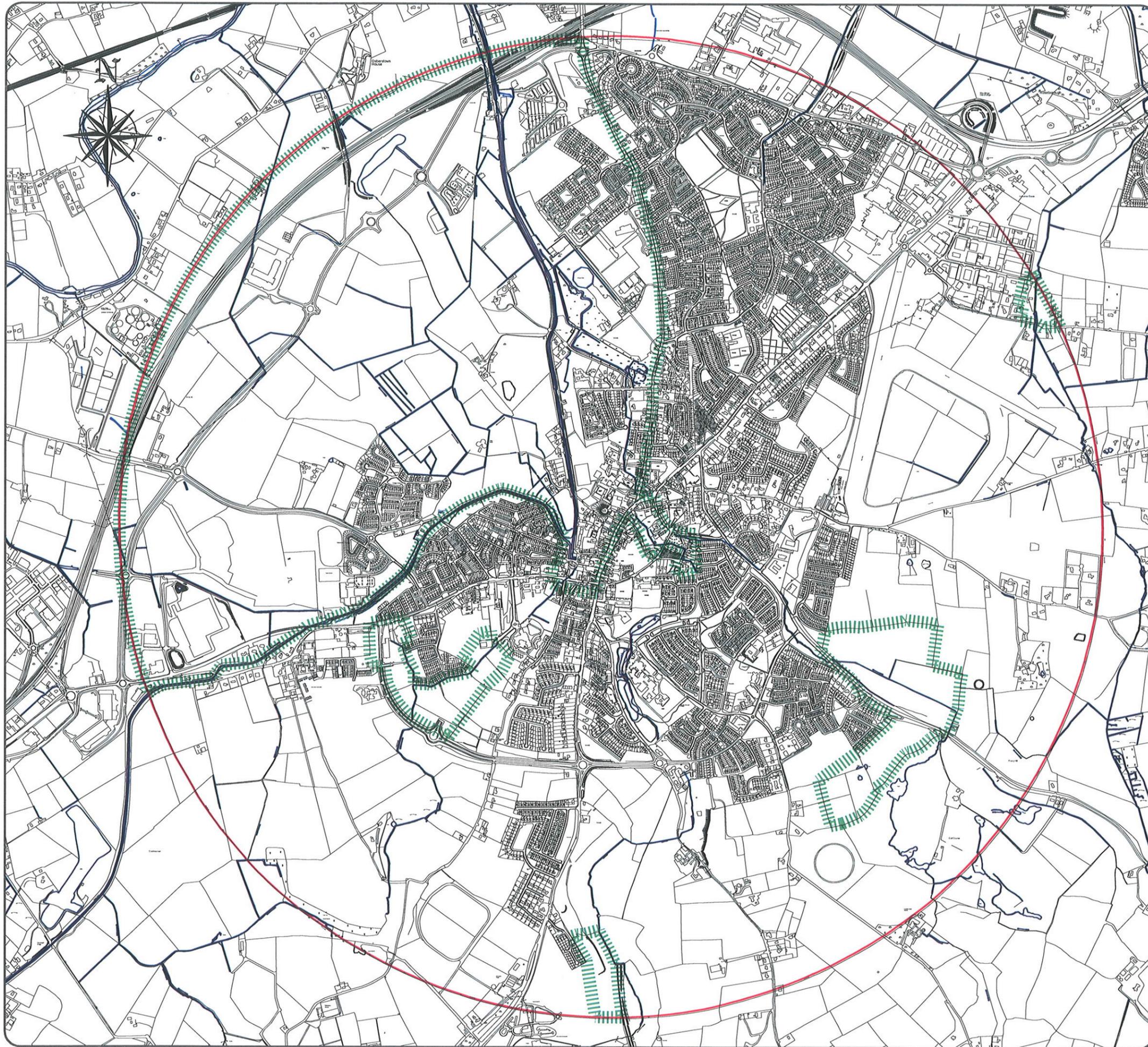
Node Label	Water Level (OD) 10% AEP	Flow (m <sup>3</sup> /s) 10% AEP	Water Level (OD) 1% AEP	Flow (m <sup>3</sup> /s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m <sup>3</sup> /s) 0.1% AEP
09BROA00162	98.03	N/A	98.16	N/A	98.47	N/A
09BROA00150	97.85	N/A	97.96	N/A	98.17	N/A
09BROA001211	97.15	1.83	97.35	2.81	97.77	7.66
09BROA00110	96.88	N/A	96.81	N/A	97.34	N/A
09BROA00102	95.60	3.24	96.65	4.59	96.86	12.72
09BROA000881	95.88	N/A	96.64	N/A	96.86	N/A
09LAKE0022al	97.38	1.51	97.56	2.21	97.90	8.73
09NASS00506J	95.15	N/A	95.84	N/A	96.01	N/A
09NASS00499I	94.88	3.23	95.79	7.55	95.99	9.90
09NCSS001041	89.72	N/A	89.74	N/A	89.76	N/A

SUBJECT SITE



<b>Map:</b> Naas Fluvial Flood Extents	
<b>Map Type:</b>	EXTENT
<b>Source:</b>	FLUVIAL
<b>Map Area:</b>	HPW
<b>Scenario:</b>	CURRENT
<b>Drawn By:</b>	C.C. Date : 20 September 2016
<b>Checked By:</b>	T.D. Date : 20 September 2016
<b>Approved By:</b>	G.G. Date : 20 September 2016
<b>Drawing No.:</b>	E09NAA_EXFCD_F1_06
<b>Map Series :</b> Page 6 of 21	
<b>Drawing Scale :</b> 1:5,000 @ A3	

**APPENDIX B – NAAS TOWN DEVELOPMENT PLAN 2011-2017, MAP 8.1  
(AREAS FOR WHICH SITE-SPECIFIC FLOOD RISK ASSESSMENT IS REQUIRED)**



NAAS TOWN COUNCIL

Naas Town Development Plan  
2011 - 2017

LEGEND

-  Development proposals for lands outlined shall be the subject of site specific Flood Risk Assessment appropriate to the type & scale of the proposed development
-  Existing watercourses and features
-  Naas Town Council Boundary

Strategic Flood Risk Assessment

Scale: N.T.S.

Map Ref.: 8.1

Date: 6<sup>th</sup> June 2011

Drawing No: 200/11/530

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