Kilkenny County Council

Site Specific Flood Risk Assessment

Proposed Housing Development at Newtown, Thomastown, Co. Kilkenny

March 2023

IE CONSULTING
WATER-ENVIRONMENTAL-CIVIL

Site Specific Flood Risk Assessment

Client: Kilkenny County Council

Location: Proposed Housing Development at Newtown, Thomastown, Co. Kilkenny

Date: 07th March 2023

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1. Introduction

IE Consulting was commissioned by Kilkenny County Council to undertake a Site Specific Flood Risk Assessment (SSFRA) in support of a planning application for a proposed housing development at Newtown, Thomastown, Co. Kilkenny.

It is proposed to construct a residential housing scheme and associated infrastructure works at the site.

The purpose of this SSFRA is to assess the potential flood risk to the site of the proposed development and to assess the impact that the development as proposed may or may not have on the hydrological regime of the area.

Quoted ground levels or estimated flood levels relate to Ordnance Datum (Malin) unless stated otherwise.

This flood risk assessment study has been undertaken in consideration of the following guidance document:

'The Planning System and Flood Risk Management – Guidelines for Planning Authorities' DOEHLG 2009.

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2. Proposed Site Description

2.1. General

The site of proposed development is located at Newtown, Lady's Well Street, Thomastown, Co. Kilkenny. The site is bounded to the north by Grennan College, to the south by a local access road, to the west by the Thomastown Primary Healthcare facility and to the east by Lady's Well Street. The total area of the site of the proposed development is approximately 0.0217km^2.

The location of the site of the proposed development is illustrated on *Figure 1* below and is shown on *Drawing Number IE2705-001-A, Appendix A*.

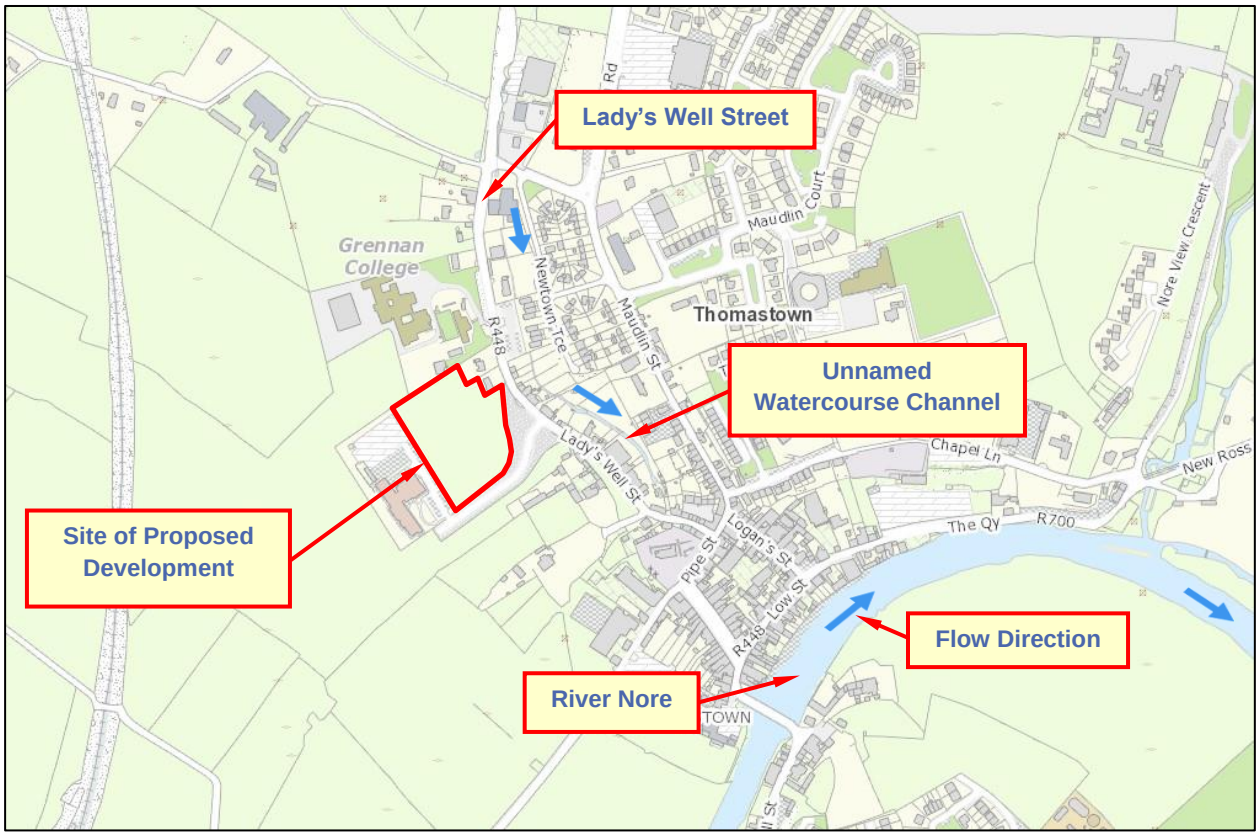

Figure 1 - Site Location

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2.2. Existing Topography Levels at Site

The site of the proposed development slopes gently from the north-western corner of the site to the south-eastern corner of the site at an approximate gradient of 0.060% (1 in 16.545).

Existing ground elevations range from approximately 34.06m OD (Malin) at the north-western corner of the site to 26.70m OD (Malin) at the south-eastern corner of the site.

2.3. Local Hydrology, Landuse & Existing Drainage

As illustrated in *Figure 1* above, the most immediate hydrological feature in the general vicinity of the site of proposed development is an unnamed watercourse channel, which flows in a north to south direction approximately 36m beyond the eastern boundary of the site. This watercourse channel is partially culverted and discharges to the River Nore at a point approximately 400m beyond the southern boundary of the site. At this location the River Nore generally flows in a south-west to north-east direction.

The catchment area of the River Nore was delineated and found to be approximately 2309.037km^2 to a point downstream of the site. An assessment of the River Nore upstream catchment area indicates that the catchment is predominantly rural in nature with the urban fraction accounting for approximately 0.9% of the total catchment area.

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3. Initial Flood Risk Assessment

The flood risk assessment for the site of the proposed development is undertaken in three principal stages, these being 'Step 1 – Screening', 'Step 2 – Scoping' and 'Step 3 – Assessing'.

3.1. Possible Flooding Mechanisms

Table 1 below summarises the possible flooding mechanisms in consideration of the site:

Source/Pathway	Significant?	Comment/Reason
Tidal/Coastal	No	The site is not located within a coastal or tidally influenced region.
Fluvial	Possible	An unnamed watercourse channel is located approximately 36m beyond the eastern boundary of the site The River Nore is located approximately 380m beyond the south-eastern boundary of the site.
Pluvial (urban drainage)	No	There is no major or significant drainage or water supply infrastructure located in the immediate vicinity of the site.
Pluvial (overland flow)	No	The site is not surrounded by significantly elevated lands and does not provide an important surface water discharge point to adjacent lands
Blockage	No	There are no significant or restrictive hydraulic structures located within or adjacent to the boundary of the site.
Groundwater	No	There are no significant springs or groundwater discharges mapped or recorded in the immediate vicinity of the site

Table 1: Flooding Mechanisms

The primary potential flood risk to the site of proposed development can be attributed to an extreme fluvial flood event in the unnamed watercourse channel located approximately 36m beyond the eastern boundary of the site and/or from the River Nore located approximately 380m beyond the south-eastern boundary of the site.

In accordance with 'The Planning System and Flood Risk Management – Guidelines for Planning Authorities - DOEHLG 2009' the potential flood risk to the site of the proposed development is analysed in the subsequent 'Screening Assessment' and ''Scoping Assessment'' section of this study report.

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4. Screening Assessment

The purpose of the screening assessment is to establish the level of flooding risk that may or may not exist for a particular site and to collate and assess existing current or historical information and data which may indicate the level or extent of any flood risk.

If there is a potential flood risk issue then the flood risk assessment procedure should move to 'Step 2 – Scoping Assessment' or if no potential flood risk is identified from the screening stage then the overall flood risk assessment can end at 'Step 1'.

The following information and data was collated as part of the flood risk screening assessment for the site of the proposed development.

4.1. OPW/EPA/Local Authority Hydrometric Data

Existing sources of OPW, EPA and local authority hydrometric data were investigated. As illustrated in *Figure 2* below, this assessment has determined that there are no hydrometric gauging stations located on the in the general vicinity of the site of proposed development.

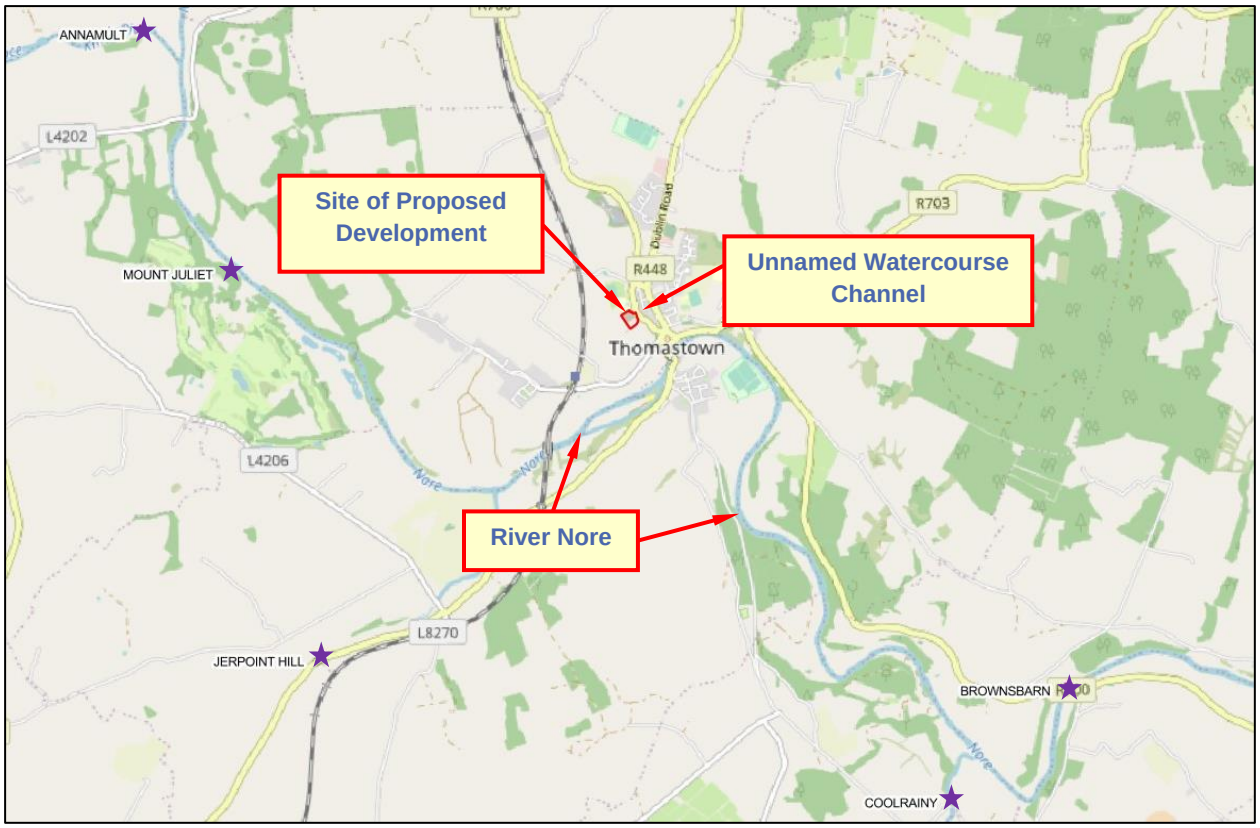

Figure 2 - Hydrometric Gauging Stations

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4.2. OPW PFRA Indicative Flood Mapping

Preliminary Flood Risk Assessment (PFRA) Mapping for Ireland was produced by the OPW in 2011. OPW PFRA flood map number 2019/MAP/184/A illustrates indicative flood zones within this area of County Kilkenny.

Figure 3 below illustrates an extract from the above indicative flood map in the vicinity of the site of the proposed development.

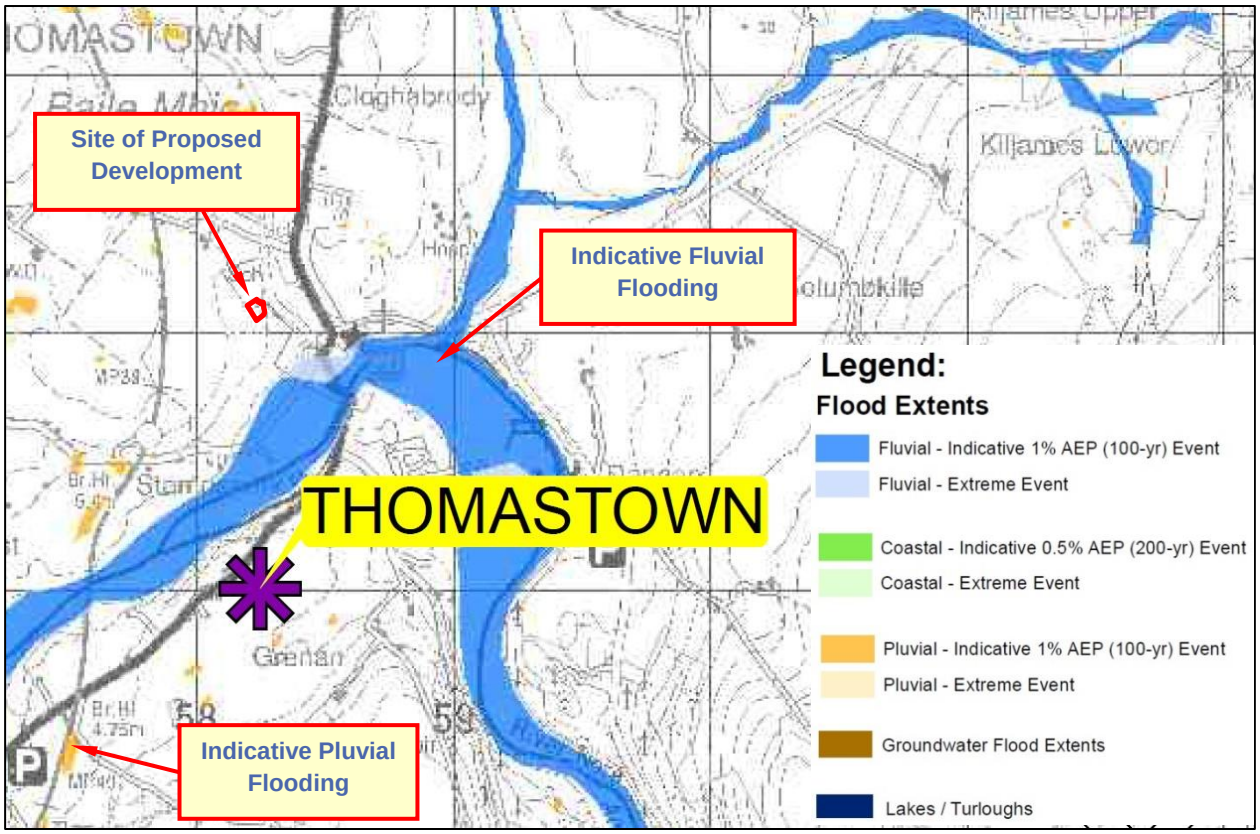

Figure 3 - OPW PFRA Mapping

The PFRA flood mapping indicates that the site of the proposed development does not fall within an indicative fluvial, pluvial or groundwater flood zone.

It should be noted that the extent of flooding illustrated on these maps was developed using a low resolution digital terrain model (DTM) and illustrated flood extents are intended to be indicative only. The flood extents mapped on the PFRA maps are not intended to be used on a site specific basis.

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4.3. OPW Flood Info Past Flood Events

The OPW Flood Info Website (www.floodinfo.ie) was consulted in relation to available historical or anecdotal information on any flooding incidences or occurrences recorded in the vicinity of the site of the proposed development. Figure 4 below illustrates mapping from the Flood Info website in the vicinity of the site.

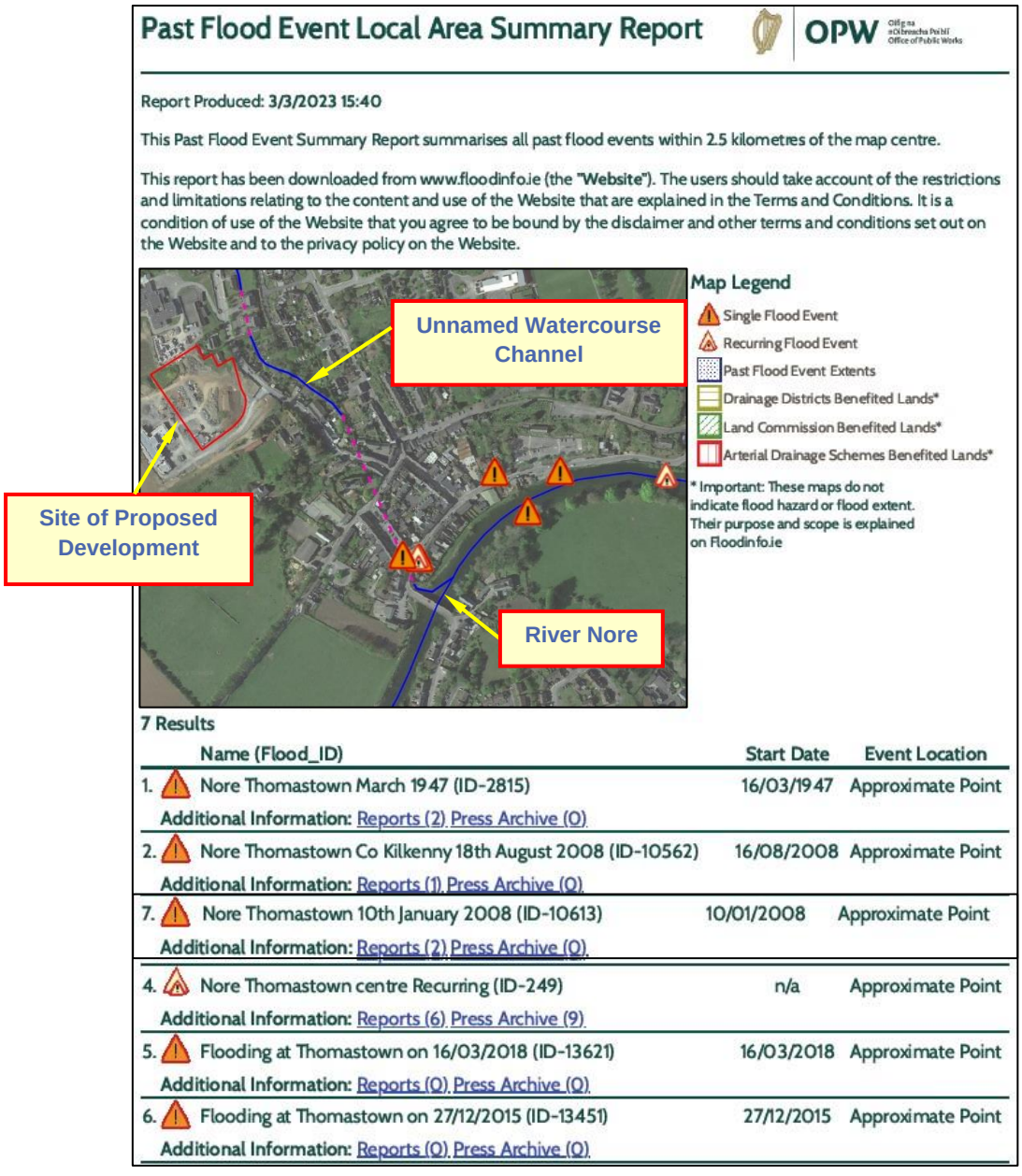

Figure 4 - OPW Flood Info Records

Figure 4 above indicates that seven flood IDs are identified within a 2.5km radius of the site of proposed development.

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Flood **ID-2815** refers to a specific flood event which occurred on the 16th of March 1947 located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are two reports but no press releases related to this flood event.

Flood **ID-10562** refers to a specific flood event which occurred on the 16th of August 2008 located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There is one report but no press releases related to this flood event. There is however a series of aerial photographs of the Thomastown area taken at 8.16pm on 18th August 2008. *Figure 5* below shows one aerial photograph, illustrating the flood extents associated with the River Nore.

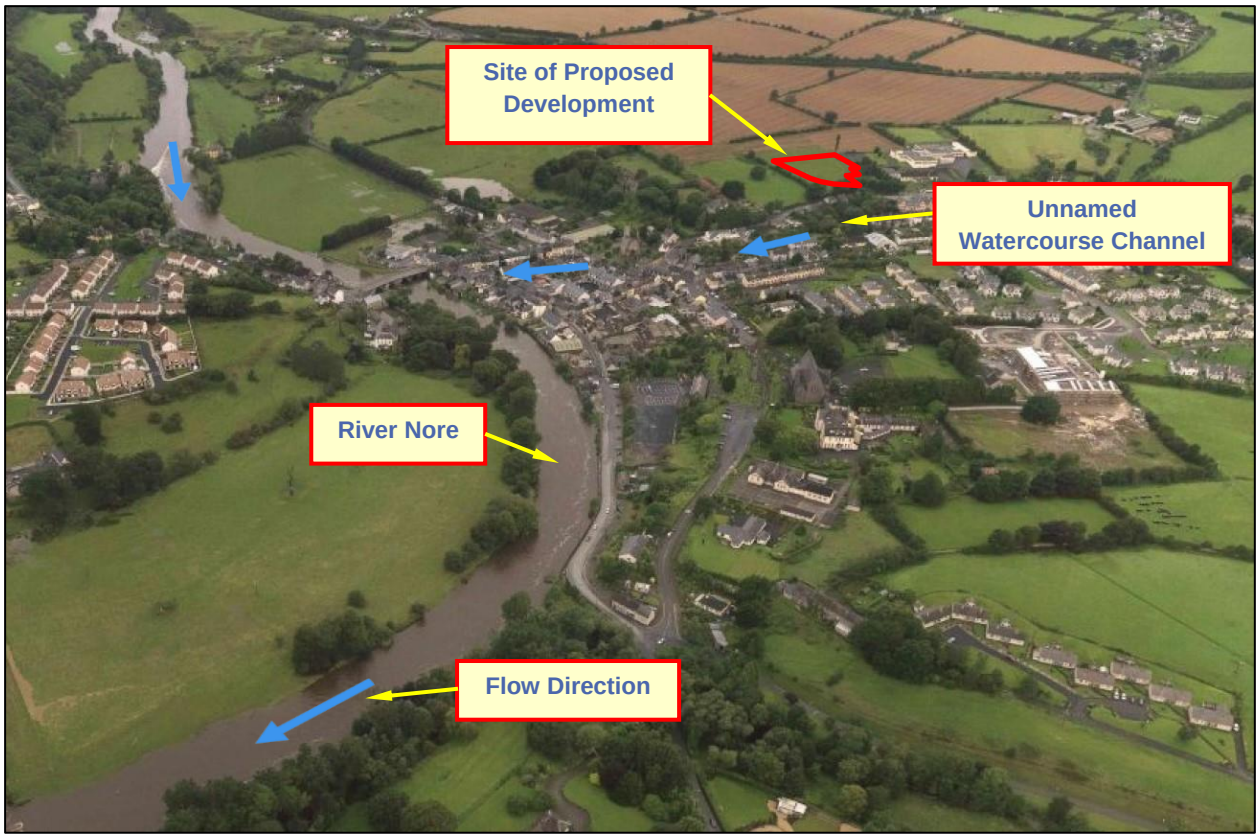

Figure 5 - Aerial Photograph of Thomastown (18/08/2008)

Flood **ID-4029** refers to an undated flood event which is located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are six reports and seven press releases related to this flood event.

Flood **ID-249** refers to an undated flood event which is located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are six reports and nine press releases related to this flood event.

Flood **ID-13621** refers to a specific flood event which occurred on the 16th of March 2018 but is located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are no reports or press releases related to this flood event.

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Flood **ID-13451** refers to a specific flood event which occurred on the 27th of December 2015 but is located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are no reports or press releases related to this flood event.

Flood **ID-10613** refers to a specific flood event which occurred on the 10th of January 2008 but is located approximately 380m beyond the south-eastern boundary of the site of proposed development on the River Nore. There are two reports but no press releases related to this flood event.

There is no information, data or anecdotal evidence to suggest that any of the above flood events impact the area of the proposed development site.

4.4. Ordnance Survey Historic Mapping

Available historic mapping for the area was consulted, as this can provide evidence of historical flooding incidences or occurrences. The maps that were consulted were the historical 6-inch maps (pre-1900), and the historic 25-inch map series.

Figure 6 and *Figure 7* below show the historic mapping for the area of the site of proposed development.

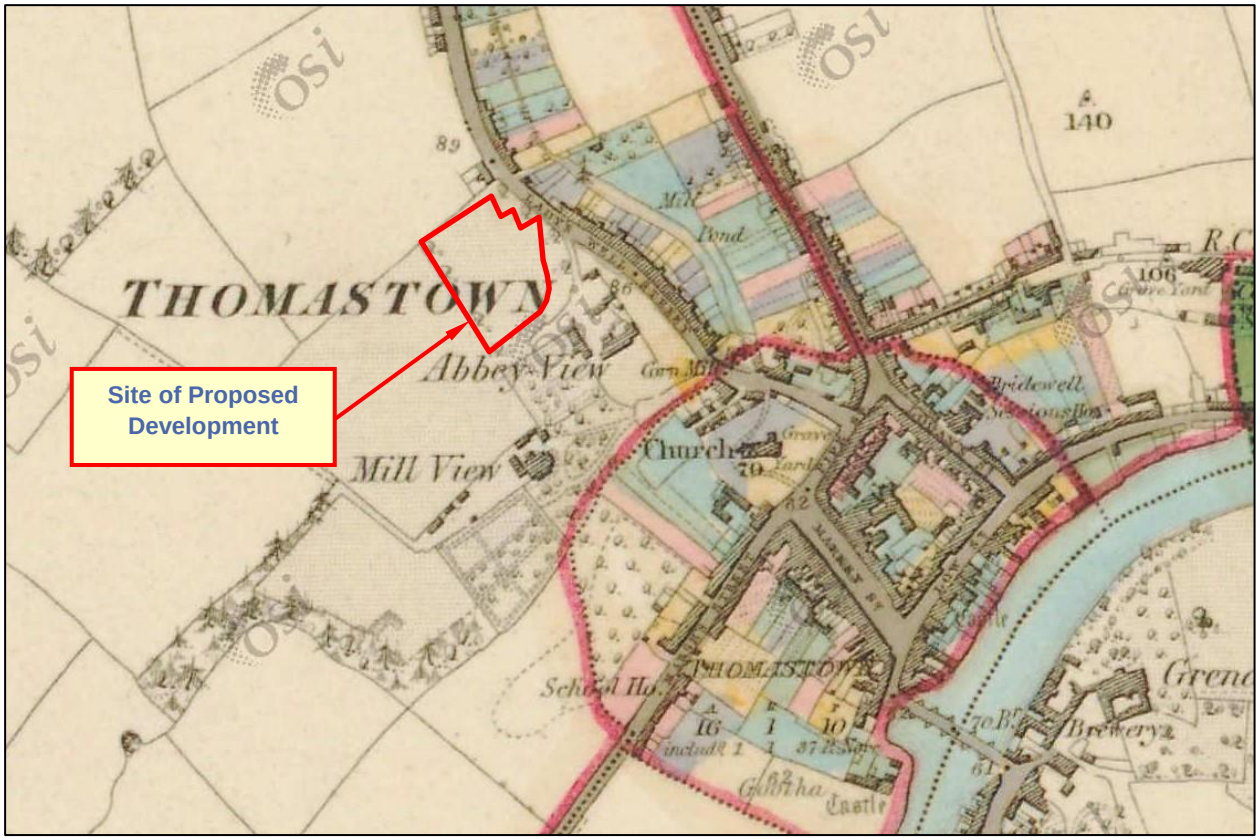

Figure 6 - Historic 6-Inch Mapping

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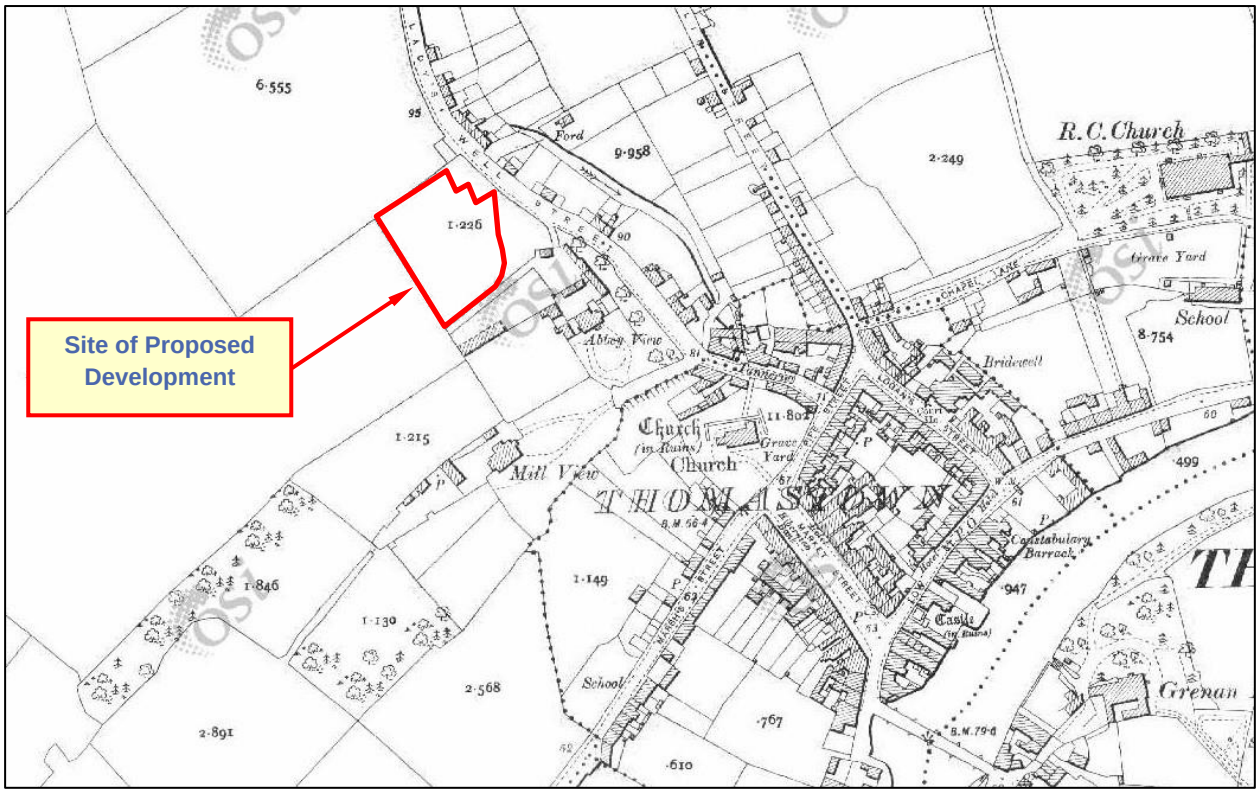

Figure 7 - Historic 25-Inch Mapping

The historic 6-inch and 25-inch mapping does not indicate any historical or anecdotal instances of flooding within or adjacent to the boundary of the site of the proposed development.

4.5. Geological Survey of Ireland Sub-Soils Mapping

The alluvial deposit maps of the Geological Survey of Ireland (GSI) were consulted to assess the extent of any alluvial deposits in the vicinity of the site of the proposed development. Alluvial deposits can be an indicator of areas that have been subject to flooding in the recent geological past. *Figure 8* below illustrates the sub-soils mapping for the general area of the site.

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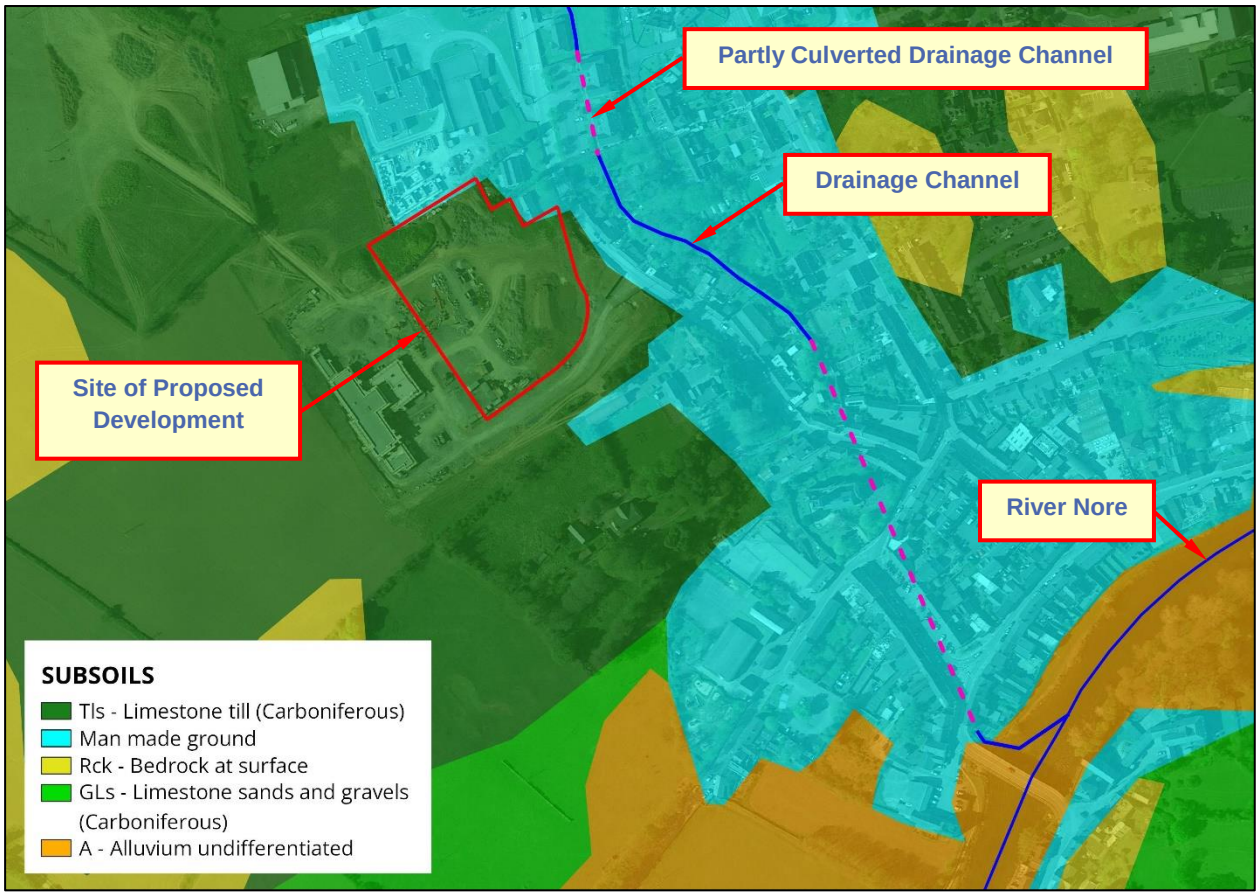

Figure 8 - GSI Subsoil Mapping

Figure 8 above indicates that the entirety of the site is underlain by Limestone till. Alluvium deposits are not mapped within or in the immediate vicinity of the site.

4.6. Geological Survey of Ireland Groundwater Flood Mapping

Historic and Predictive Groundwater Mapping for Ireland was prepared by the GSI Department of Communication, Climate Action and Environment in collaboration with Trinity College Dublin and the Institute of Technology Carlow.

Figure 9 below illustrates an extract from the above groundwater flood mapping in the vicinity of the site of proposed development.

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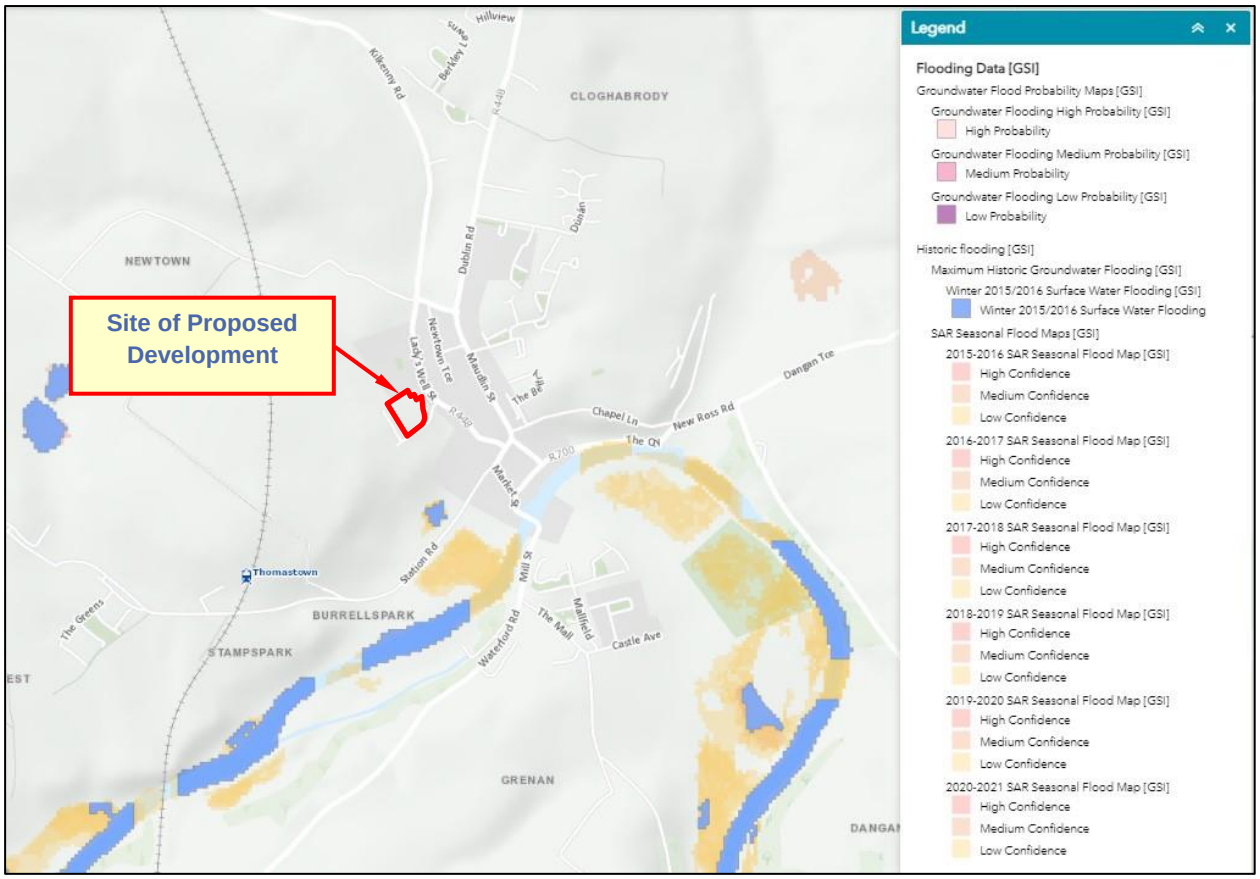

Figure 9 - GSI Groundwater Flood Mapping

The above GSI Groundwater Mapping indicates no areas of predictive or historical groundwater or surface water flooding located in the vicinity of the site.

4.7. Thomastown Local Area Plan 2019

As part of the Thomastown Local Area Plan 2019, Thomastown was assessed for flood risk in line with the standards and recommendations of the 'Planning System & Flood Risk Management Guidelines'.

Figure 10 below illustrates an extract from the Thomastown Local Area Plan Flood Risk Map in the vicinity of the site of proposed development.

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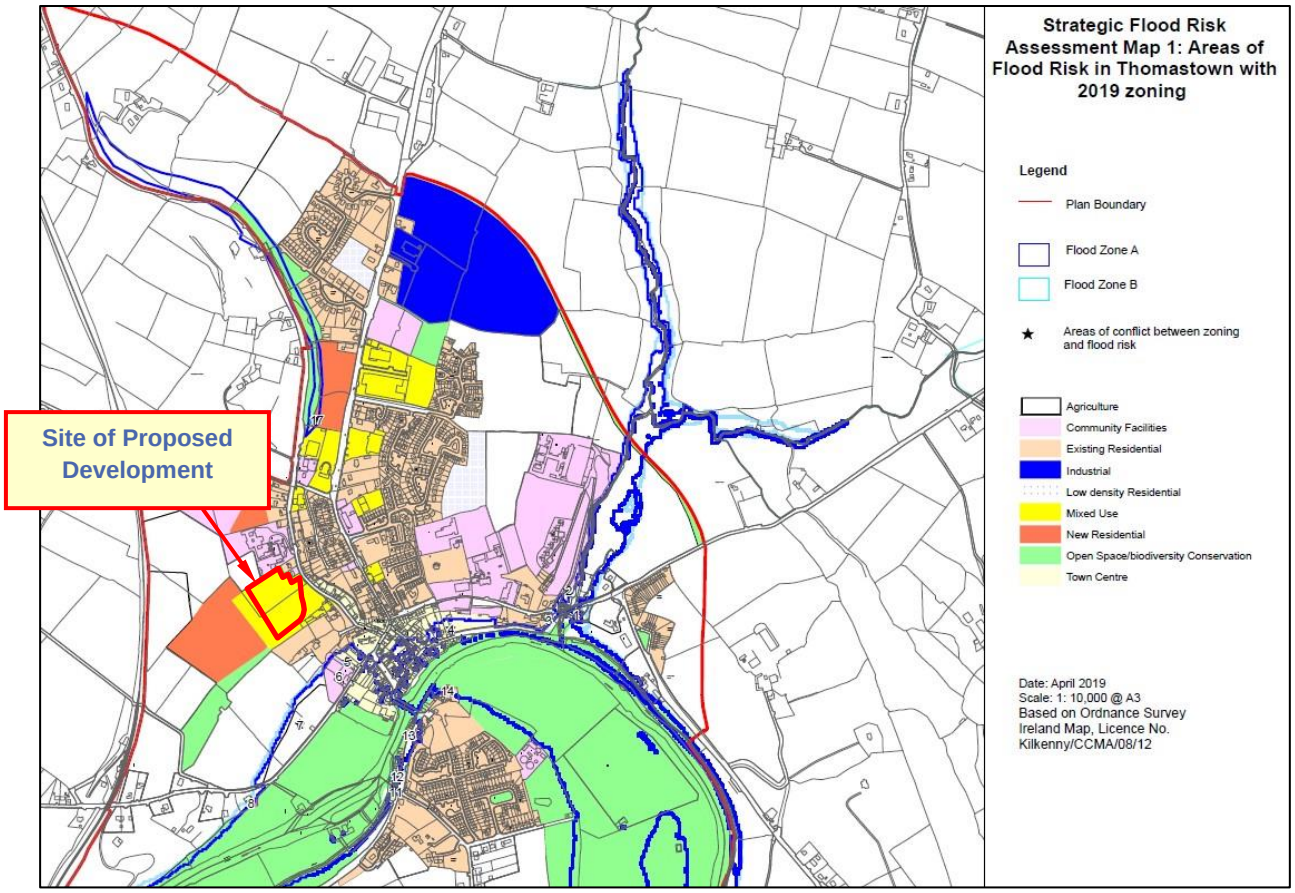

Figure 10 - Thomastown LAP 2019 – Flood Risk Map

As illustrated in *Figure 10* above, the site of proposed development does not fall within a predictive, indicative or strategic Flood Zone A (1 in 100 year) or Flood Zone B (1 in 1000 year).

4.8. South Eastern CFRAMS Fluvial Flood Mapping

The South Eastern Catchment Flood Risk & Management Study (CFRAMS) has been undertaken by the OPW and the final version of the flood maps were issued in September 2016. Flood risk extent and depth maps for further assessment areas within Thomastown have also been produced.

OPW CFRAMS predictive fluvial flood map number *O15THO_EXFCD_F0_03* illustrates predictive extreme fluvial flood extent zones associated with the River Nore in the general vicinity of the site of proposed development. *Figure 11* below (extracted from South Eastern CFRAMS flood map *O15THO_EXFCD_F0_03*), illustrates the predictive extreme 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) flood extents in the general vicinity of the site.

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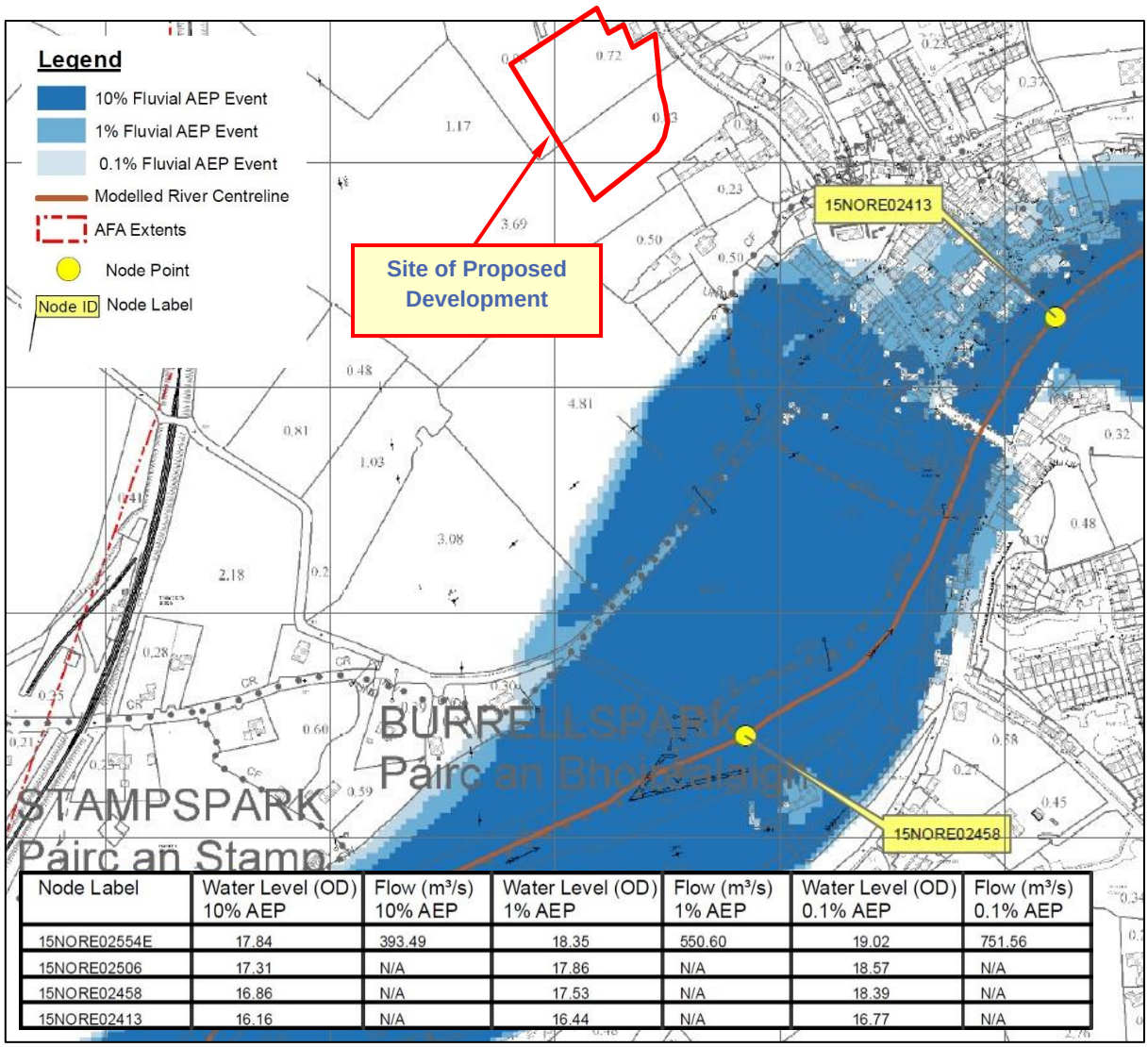

Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 1% AEP	Flow (m³/s) 1% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
15NORE02554E	17.84	393.49	18.35	550.60	19.02	751.56
15NORE02506	17.31	N/A	17.86	N/A	18.57	N/A
15NORE02458	16.86	N/A	17.53	N/A	18.39	N/A
15NORE02413	16.16	N/A	16.44	N/A	16.77	N/A

Figure 11 - CFRAMS Fluvial Flood Maps

As illustrated in *Figure 11* above, the site of proposed development does not fall within a predictive 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) or 0.1% AEP (1 in 1000 year) fluvial flood zone.

The South Eastern CFRAMS flood map reference *O14ATY_EXFCD_F0_07* provides information on predicted flood water levels and volumes for 10% AEP (1 in 10 year), 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood events at various node points along the River Nore. The node points closest to the site of the proposed development are referenced as node points *15NORE02413* and *15NORE02458* located upstream and downstream of the site as illustrated in *Figure 11* above. Details of the predicted fluvial flood levels for these South Eastern CFRAMS node points are listed in ***Error! eference source not found.*** below.

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Node Label	Water Level (m OD) 10% AEP	Water Level (m OD) 1% AEP	Water Level (m OD) 0.1% AEP
15NORE02458	16.86	17.53	18.39
15NORE02413	16.16	16.44	16.77

Table 2: South Eastern CFRAMS Predicted Fluvial Flows and Flood Levels

It is noted that the lowest topographical elevation within the boundary of the site of proposed development is 26.7m OD (Malin), which is 8.31m higher than the upstream predicted 0.1% AEP (1 in 1000 year) flood level in the River Nore.

4.9. Climate Change

The flood extents illustrated in *Figure 11* above are based on the current scenario 1% AEP (1 in 100 year) and 0.1% AEP (1 in 1000 year) fluvial flood extents in the River Nore and do not account for the potential impact of climate change. The potential mid-range future climate change scenario (MRFS) fluvial flood extents in the general location of the site of proposed development are shown in *Figure 12* below, which have been acquired from the OPW CFRAMS mapping web map service dataset.

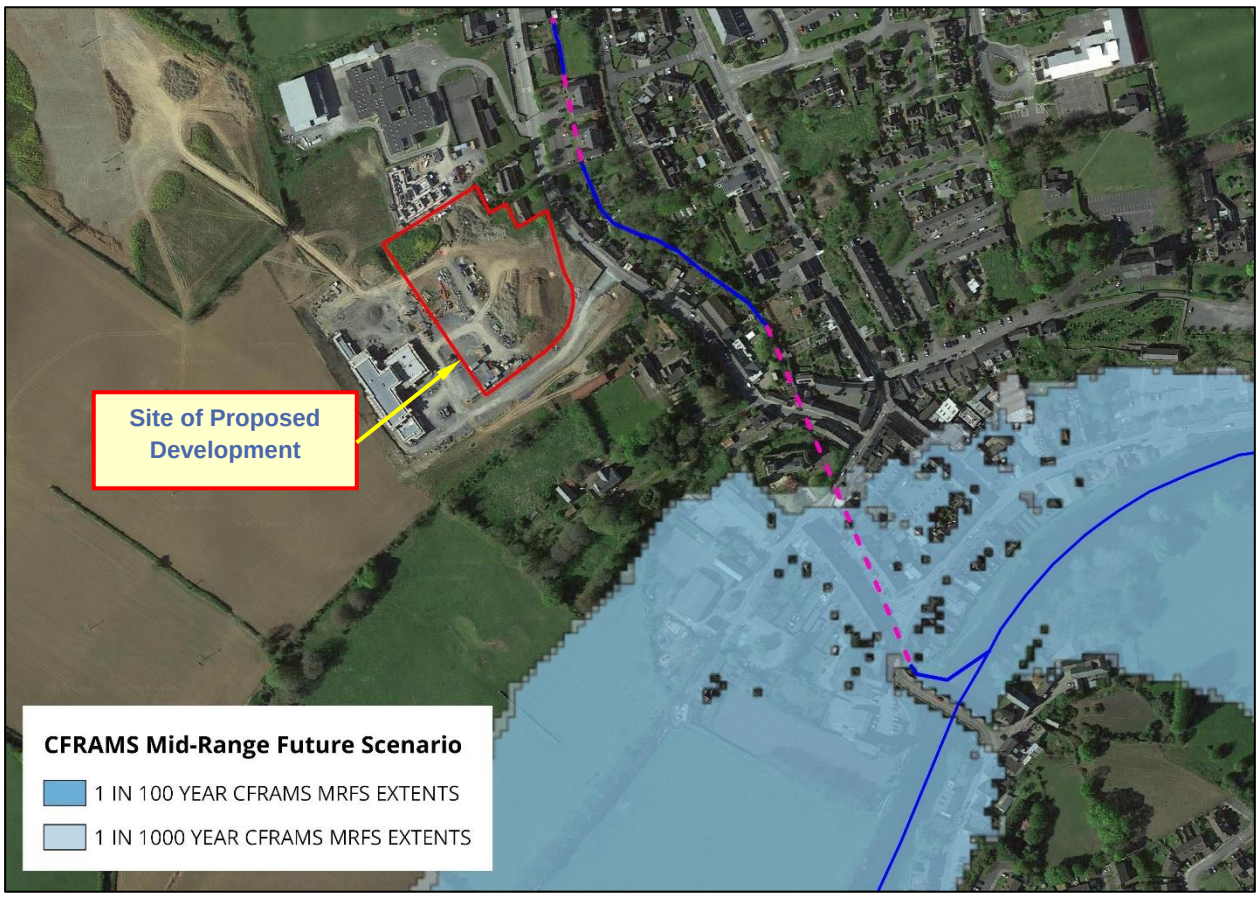

Figure 12 - CFRAMS Dataset Mid-Range Future Climate Change Scenario Fluvial Flood Extents

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Figure 12 above indicates that the site of proposed development does not fall within a MRFS 1% AEP (1 in 100 year) or 0.1% AEP (1 in 1000 year) fluvial flood zone.

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5. Scoping Assessment

The purpose of the scoping stage is to identify possible flood risks and to implement the necessary level of detail and assessment to assess these possible risks, and to ensure these can be adequately addressed in the flood risk assessment. The scoping exercise should also identify that sufficient quantitative information is already available to complete a flood risk assessment appropriate to the scale and nature of the development proposed.

In consideration of the information collated as part of the screening exercise, and the availability of other information and data specific to the area of the site of the proposed development, it is considered that sufficient quantitative information to complete an appropriate flood risk assessment for the site of proposed development can be derived from the information collated as part of the screening exercise.

6. Assessment of Flood Risk

The screening assessment undertaken as part of this Site Specific Flood Risk Assessment indicates that the site of proposed development is not susceptible to predictive, indicative, historic or anecdotal fluvial, pluvial or groundwater flood risk. Therefore the potential primary and direct flood risk to the site of proposed development is considered to be LOW.

In order to ensure that the development as proposed does not result in an adverse impact to the existing hydrological regime of the area and does not increase fluvial or pluvial flood risk elsewhere, it is recommended that the development as proposed incorporates an appropriate storm-water management system which limits post development storm-water runoff from the site to pre-development greenfield runoff rates.

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7. Development in the Context of the Guidelines

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in consideration of flood risk to a particular development site.

Flood Zone 'A' – where the probability of flooding from rivers and watercourses is the highest (greater than 1% or 1 in 100 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'B' – where the probability of flooding from rivers and watercourses is moderate (between 0.1% or 1 in 1000 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone 'C' – where the probability of flooding from rivers and watercourses is low or negligible (less than 0.1% or 1 in 1000 year for both river and watercourse and coastal flooding). Flood Zone 'C' covers all areas that are not in Zones 'A' or 'B'.

The 'Planning System and Flood Risk Management Guidelines' list the planning implications for each flood zone, as summarised below:

Zone A – High Probability of Flooding. Most types of development would not be considered in this zone. Development in this zone should be only be considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the 'Planning System and Flood Risk Management Guidelines' justification test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space and outdoor sports and recreation would be considered appropriate in this zone.

Zone B – Moderate Probability of Flooding. Highly vulnerable development such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses, strategic transport and essential utilities infrastructure would generally be considered inappropriate in this zone, unless the requirements of the justification test can be met. Less vulnerable development such as retail, commercial and industrial uses and recreational facilities might be considered appropriate in this zone. In general however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone 'C' and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to the development can be adequately managed and that development in this zone will not adversely affect adjacent lands and properties.

Zone C – Low to Negligible Probability of Flooding. Development in this zone is appropriate from a flood risk perspective. Developments in this zone are generally not considered at risk of fluvial flooding and would not adversely affect adjacent lands and properties from a flood risk perspective.

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In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' the assessment and analysis undertaken as part of this Site Specific Flood Risk Assessment indicates that the site of proposed development does not fall within a predictive, indicative or strategic fluvial flood zone. The site of the proposed development therefore falls within Flood Zone 'C'.

In accordance with the 'Planning System & Flood Risk Management Guidelines, DOEGLG, 2009' the development as proposed is not subject to the requirements of the Justification Test.

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8. Summary Conclusions & Recommendations

In consideration of the findings of this Site Specific Flood Risk Assessment and analysis the following conclusions and recommendations are made in respect of the site of the proposed development:

- *A Site Specific Flood Risk (SSFRA) assessment, appropriate to the type and scale of development proposed, and in accordance with 'The Planning System and Flood Risk Management Guidelines – DoEHLG-2009' has been undertaken.*
- *The site of the proposed development has been screened, scoped and assessed for flood risk in accordance with the above guidelines.*
- *The assessment and analysis undertaken as part of this Site Specific Flood Risk Assessment indicates that the site of proposed development is not susceptible to predictive, indicative, historic or anecdotal fluvial, pluvial or groundwater flooding.*
- *In consideration of the findings of this Site Specific Flood Risk Assessment, in the context of 'The Planning System & Flood Risk Management Guidelines – 2009', the area of the proposed development site falls within Flood Zone 'C'.*
- *It is recommended that the development as proposed incorporates an appropriate storm-water management system which limits post development storm-water runoff from the site to pre-development greenfield runoff rates.*
- *The proposed development is not expected to result in an adverse impact to the existing hydrological regime of the area, will not impact or impede access to a watercourse, flood plain or flood protection and management facilities and would not increase the risk of flooding to adjacent lands or properties.*
- *In consideration of the findings of this Site Specific Flood Risk Assessment and the incorporation of the recommendations made in this report, it is considered that the development as proposed is appropriate from a flood risk perspective.*

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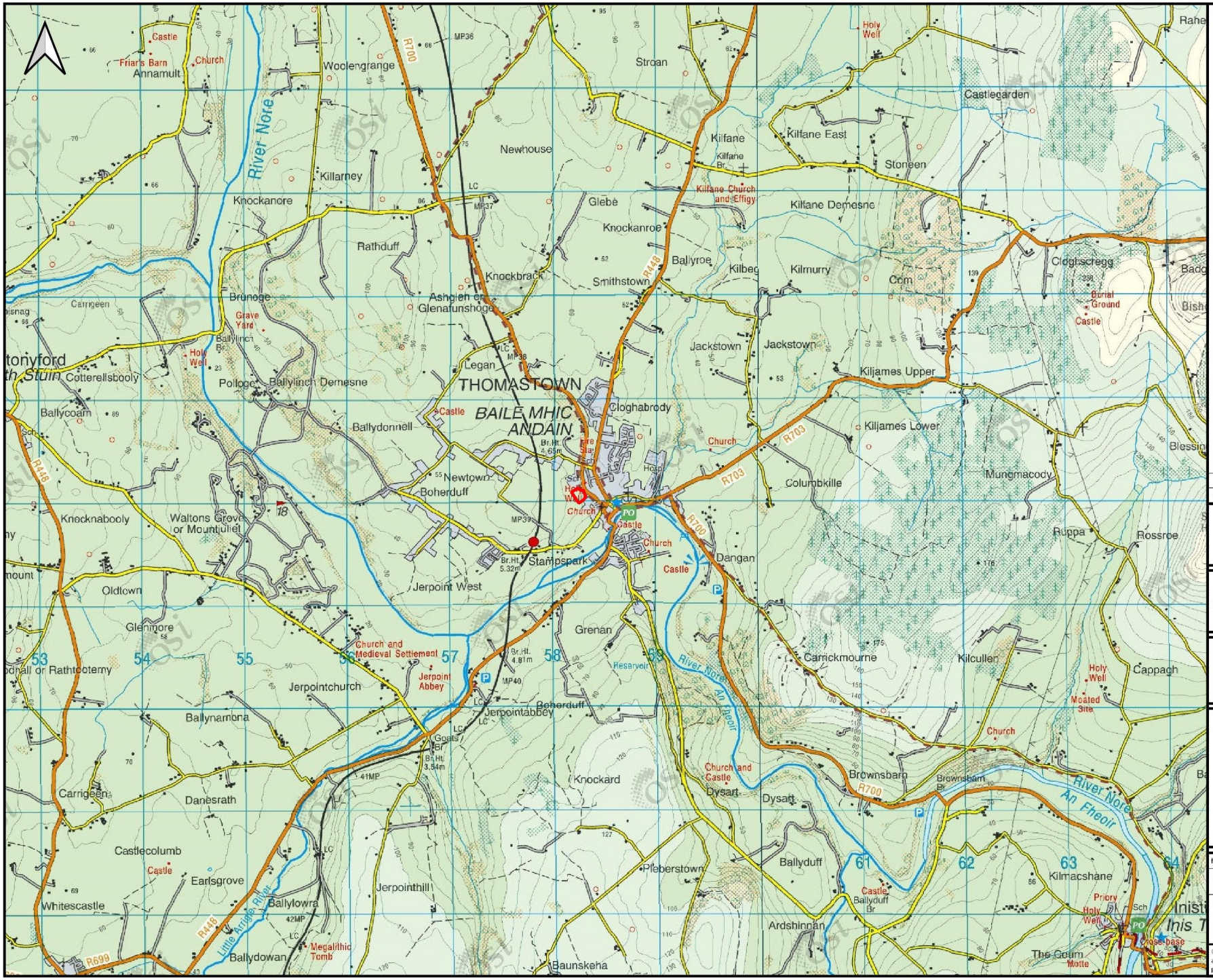
Appendices

Appendix A. Drawings

IE2705-001-A Site Location



LEGEND

SITE BOUNDARY

rev.	date	amendment	drn	ckd
A	06.03.23	ISSUE	MH	MOF

PROPOSED HOUSING DEVELOPMENT AT NEWTOWN, THOMASTOWN, CO. KILKENNY

SITE SPECIFIC FLOOD RISK ASSESSMENT

LOCATION PLAN

IE CONSULTING
WATER-ENVIRONMENTAL-CIVIL

CARLOW OFFICE:
INNOVATION CENTRE
GREEN ROAD
CARLOW R95 W248

NEWRY OFFICE:
1 RDC HOUSE
MIN BUSINESS PARK
NEWRY BT35 6PH

file location: N:\IE2705\DRAWINGS		scale: 1:50,000	A3
drawing status: PLANNING		datum: MALIN	
		drawn: MH	
drawing no. IE2705-001	rev: A	checked: MOF	
		approved: PMS	
		date: 06/03/2023	

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