

Client:

Meath County Council

Project:

Proposed Burial Ground and
Playground Development at
Gormanstown / Stamullen, Co.
Meath

Flood Risk Assessment Report

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SECTION 1: Introduction

1.1 General

J.B. Barry and Partners Limited were commissioned by Meath County Council to undertake a site specific Flood Risk Assessment (FRA) to inform a Part 8 planning application for a proposed recreational development at the greenfield lands near Stamullen, Co. Meath. The aim of the FRA is to identify, quantify and communicate to decision makers and other stakeholders the risk of flooding associated with the proposed development.

The FRA has been carried out in accordance with 'The Planning System and Flood Risk Management Guidelines' (hereafter referred to as the FRM Guidelines) published in November 2009 jointly by the then Department of the Environment, Heritage and Local Government, DEHLG, (now the Department of the Environment, Community and Local Government, DECLG) and the Office of Public Works (OPW).

The proposed development site is located approximately 1km east to Stamullen village in County Meath and immediately to the west of the M1 motorway shown in Figure 1-1 below.



Figure 1-1: Location of Proposed Development (Source: Google Maps, annotation by J.B. Barry & Partners)

1.2 Proposed Development

The proposed development consists of developing greenfield land near Stamullen Village for the purposes of constructing a Burial Ground & Playground including associated roads, a caretaker building with public toilets, footpaths, parking, landscaping, site services, SuDS measures and sundry related works.

For the purpose of this assessment. The site will be considered to be made up of two distinct sections: the northern portion of the site and the southern portion of the site. The majority of development will occur within the northern portion of the site and will include the burial ground, playground, caretaker

building, toilets and associated services. The development within the southern portion of the development will consist of a walkway in a wooded area and an infiltration pond.

The proposed site layout is shown in figure 1-2 below.

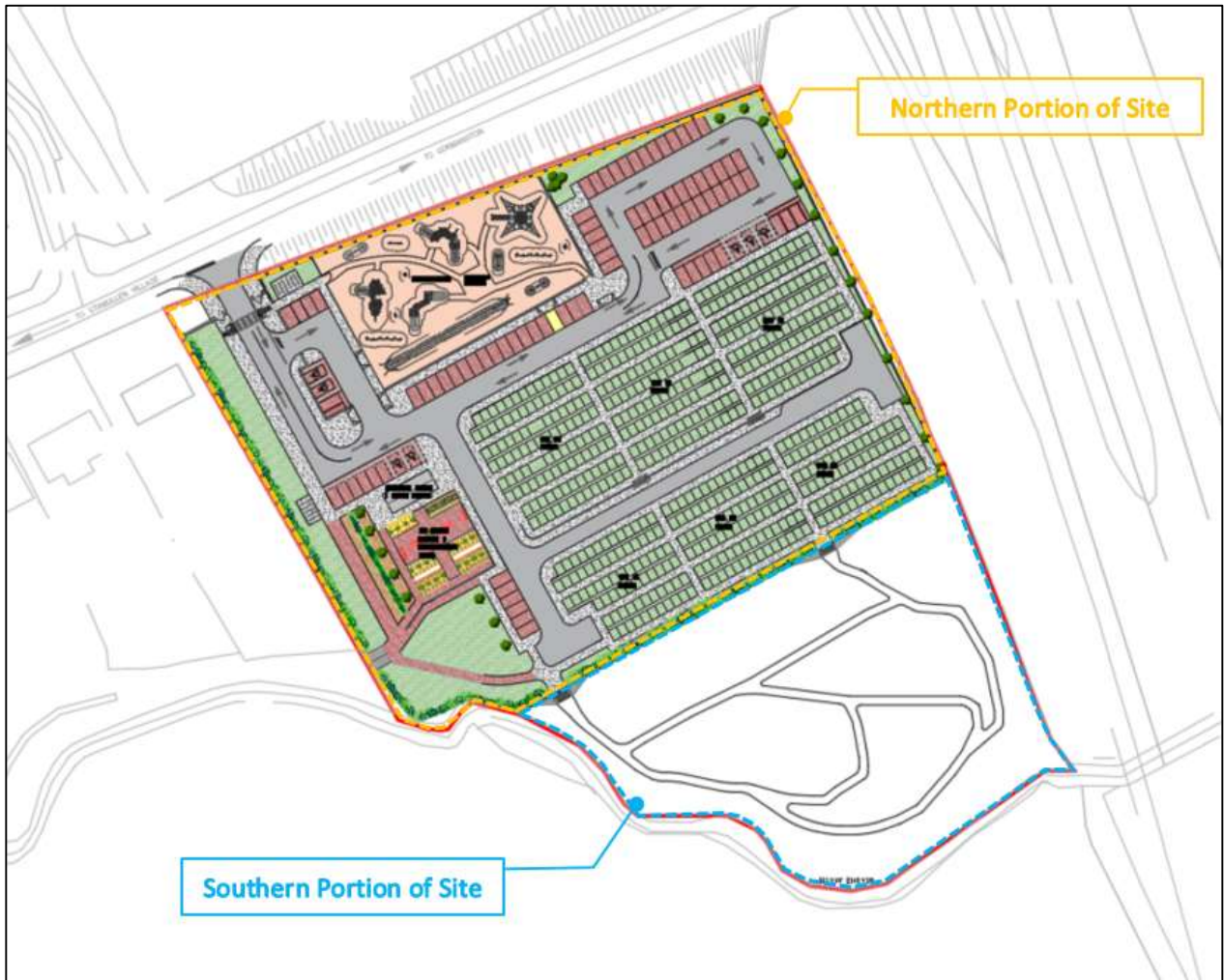


Figure 1-2: Proposed Site Layout

SECTION 2: Flood Risk Assessment Methodology

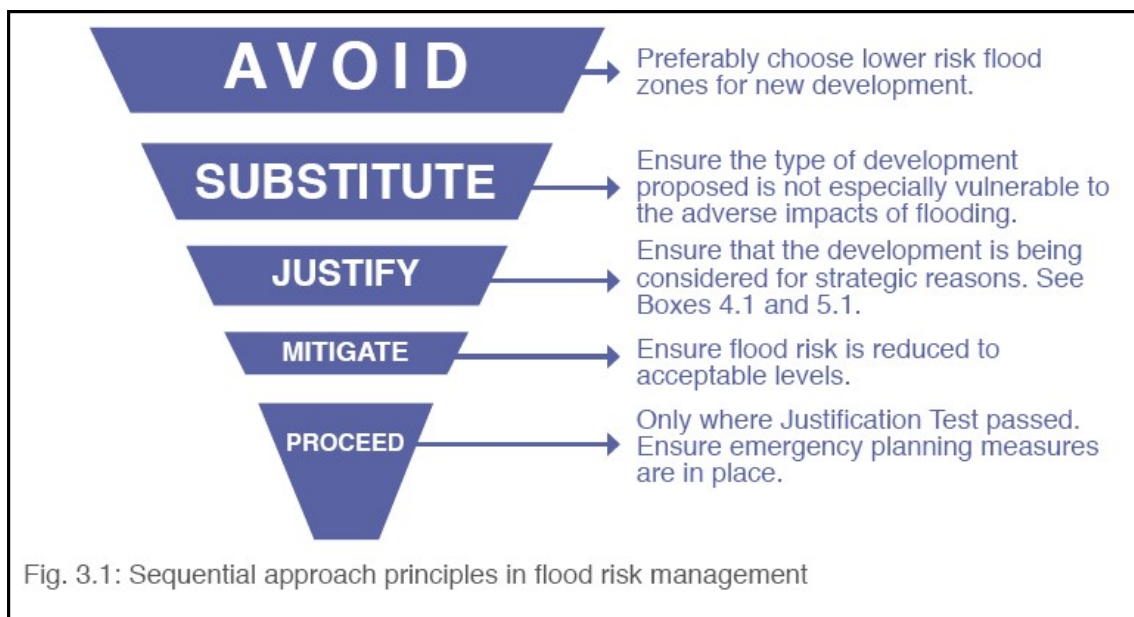
2.1 Methodology

The methodology used for the flood risk assessment for the proposed development is based on 'The Planning System and Flood Risk Management, Guidelines for Planning Authorities' (2009). The FRM Guidelines require the planning system at national, regional and local levels to:

- Avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development;
- Adopt a sequential approach to flood risk management when assessing the location for new development based on avoidance, reduction and then mitigation of flood risk; and
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

The sequential approach (see Figure 3.1 of the FRM Guidelines below) in flood risk management requires the following three steps to identify the necessity for the justification test for a development:

- Step 1: Identification of the Flood Zone at the proposed development site (Section 2.23 of the FRM Guidelines);
- Step 2: Identification of the vulnerability of the type of the proposed development (Table 3.1 of the FRM Guidelines); and
- Step 3: Using the matrix of vulnerability versus Flood Zone (Table 3.2 of the FRM Guidelines), identify the necessity for the justification test for the proposed development.



While Figure 3.1 of The FRM Guidelines sets out the broad philosophy underpinning the sequential approach in the flood risk management, Figure 3.2 of the Guidelines (shown below) describes the mechanism of the sequential approach for use in the planning process.

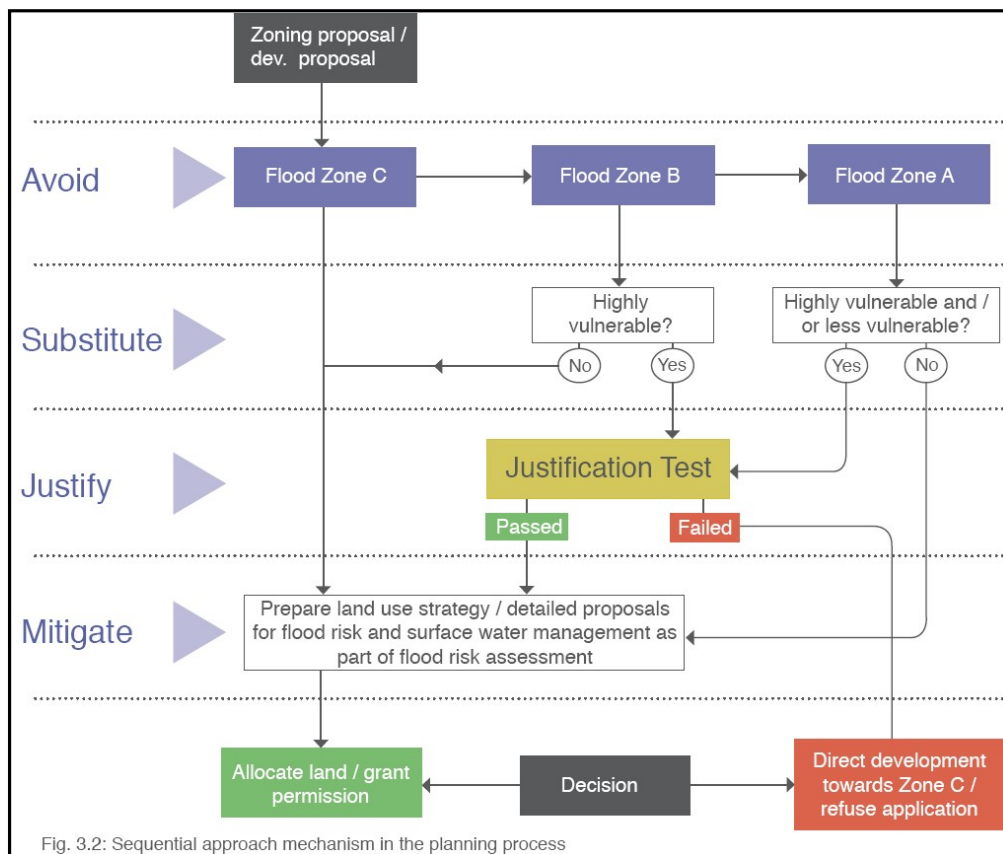


Fig. 3.2: Sequential approach mechanism in the planning process

According to the FRM Guidelines, Flood Zones are graphical areas within which the likelihood of flooding is in a particular range. 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 Flood Zones, namely,

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% AEP or 1 in 100 year 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% AEP or 1 in 1000 year and 1% AEP or 1 in 100 year for river flooding and between 0.1% AEP or 1 in 1000 year and 0.5% AEP or 1 in 200 year for coastal flooding); and
- **Flood Zone C** – where the probability of flooding from rivers and the sea is low (less than 0.1% AEP or 1 in 1000 for both river and coastal flooding).

Flood Zones A, B and C are based on the current assessment of the 1% AEP and the 0.1% AEP fluvial events and the 0.5% AEP and 0.1% AEP tidal events, without the inclusion of climate change factors. Table 3.1 of the FRM Guidelines (see below) shows the classification of the vulnerability to flooding of different types of development.

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

Table 3.1 Classification of vulnerability of different types of development

Table 3.2 of the FRM Guidelines (shown below) identifies the types of development that would be appropriate for each Flood Zone and those that would be required to meet the Justification Test. The northern portion of the site will consist of a caretaker building with public toilets and as such is classified as less vulnerable development (red above). However, the southern portion of the site consists of a walkway in a wooded area and an infiltration pond which is classified as water-compatible development (yellow above). Table 3.2 presents the required actions for each flood zone.

	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 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

The FRM Guidelines (Chapter 2) outlines the following three stages of flood risk assessment:

Stage 1: Flood risk identification – to identify whether there may be any flooding or surface water management issues relating to the proposed development site that may warrant further investigations.

Stage 2: Initial flood risk assessment – to confirm sources of flooding that may affect the proposed development site, to appraise the adequacy of existing information and to determine what surveys and modelling approach is appropriate to match the spatial resolution required and complexity of the flood risk issues. This stage involves the review of existing studies and hydraulic modelling to assess flood risk and to assist with the development of FRM measures.

Stage 3: Detailed flood risk assessment – to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk to a proposed or existing development, of its potential impacts on flood risk elsewhere and of the effectiveness of any proposed mitigation measures. This will typically involve use of an existing or construction of a hydraulic model across a wide enough area to appreciate the catchment wide impacts and hydrological process involved.

2.2 Data Collection

Data required for the flood risk assessment was obtained from various sources, as described below.

- The historic flood data was obtained from the National Flood Hazard Mapping website www.floodinfo.ie
- The Subsoil and Aquifer vulnerability data was obtained from the Geological Survey of Ireland website www.gsi.ie
- Draft Flood Risk Management Plans were obtained from the CFRAM Study undertaken by the OPW
- Meath County Council Strategic Flood Risk Assessment 2020-2026

SECTION 3: Existing Hydrological Environment

3.1 Salient Hydrological Features

The main hydrological feature of the area is the River Delvin. The River Delvin flows in an easterly direction and forms the southern boundary of the proposed development site before crossing under the M1 and eventually discharging to the Irish Sea at Gormanstown approximately 2.6km downstream from the site. Figure 3-1 below shows the main hydrological features associated with the site.

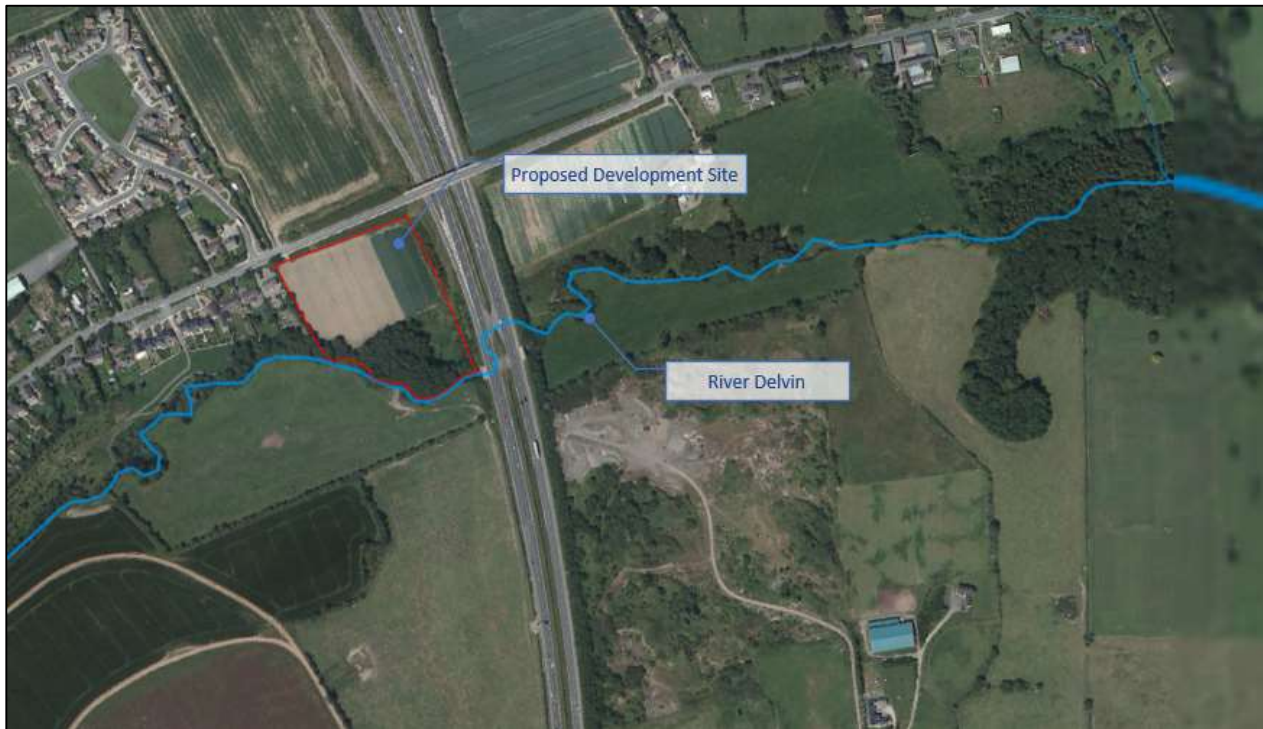


Figure 3-1: Hydrological Features of the Area (Source: Google Maps, annotation by J.B. Barry & Partners)

3.2 Existing Geology and Hydrogeology of the Area

The Geological Survey of Ireland (GSI) website provides information on their public online mapping service at www.gsi.ie on subsoil type and aquifer vulnerability. The maps presented in *Figure 3-2* and *Figure 3-3* depict the subsoil type and aquifer vulnerability for the proposed development site. The GSI subsoil mapping (*Figure 3-2*) indicates the site sits on deep well drained mineral with traces of alluvium found closer to the river.

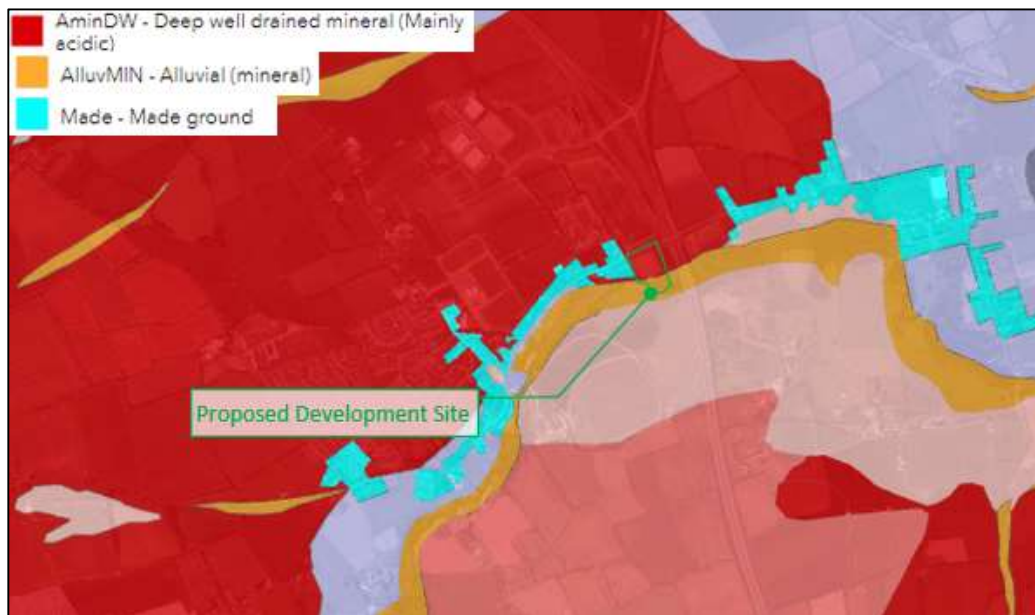


Figure 3-2: GSI Subsoil Mapping (Source: www.gsi.ie, annotation by J.B. Barry & Partners)

Furthermore, the interactive web-mapping site classifies the aquifer vulnerability in this region as having a vulnerability rating ranging from low in the north of the site to high at the south of the site (Figure 3-3). The GSI state that “Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities”. The GSI further describes that the vulnerability of groundwater depends on:

- The time of travel of infiltrating water (and contaminants);
- The relative quantity of contaminants that can reach the groundwater; and
- The contaminant attenuation capacity of the geological materials through which the water and contaminants infiltrate.



Figure 3-3: GSI Aquifer Vulnerability Mapping (Source: www.gsi.ie, annotation by J.B. Barry & Partners)

3.3 Flood Regime of the Area

The National Flood Hazard Mapping Website www.floodinfo.ie does not show any records of historic flooding occurring at the proposed development site. The nearest historic flood to the proposed site occurred at Stamullen village approximately 1km upstream. Records from www.floodinfo.ie shows that this flood occurs due to the River Delvin overflowing its banks after heavy rain and occurs 2 to 3 times a year.

Approximately 1.5km downstream at Martin's Road, Gormanstown recurring flooding occurs on flat land with no drainage every year after heavy rain.

A Summary Local Area Report (SLAR) was generated for the site, which identifies all flooding events, which occurred within 2.5km of the proposed development site (included in Appendix 1). Figure 3-4 below demonstrates the floods occurring within the vicinity of the site.



Figure 3-4: Location of historic flooding in the vicinity of the proposed site (Source: www.floodinfo.ie annotation by J.B. Barry & Partners)

3.4 Existing Flood Studies

3.4.1 GSI Groundwater Flood Maps

In response to the serious flooding of winter 2015/16 the GSI was commissioned to undertake a study of groundwater related flooding, with particular emphasis on limestone and karst regions. In June 2020 the GSI published its findings and published flood risk maps. Historic groundwater flood maps were produced which show maximum observed flood extents for locations of recurrent groundwater flooding, as well as predictive groundwater flood maps which present probabilistic groundwater flood events with flood extents predicted for a range of AEP's.

The GSI groundwater flood maps were examined as part of this study and it was determined that there have been no historic nor predictive groundwater related flood risks in the vicinity of the area.

3.4.2 CFRAM Study

The OPW, as lead agency for flood risk management in Ireland, is producing Flood Risk Management Plans (FRMP), in line with National Flood Policy and the requirements of the EU Floods Directive. FRMP's are currently being produced by the OPW under the CFRAM Study. The FRMP's make use of the information provided through the flood maps that have previously been produced under the CFRAM Programme and previous parallel projects. The FRMP's set out a range of proposed measures and actions to manage and reduce flood risk within the catchments and coastal reaches covered by each Plan, focusing on the 300 areas of potentially significant flood risk around Ireland that were identified under the PFRA. The Flood Maps associated with the FRMP's are available online to view at www.floodinfo.ie.

Figure 3-5 is an extract from the Fluvial Flood Extent Map concerning the proposed development site. This map is included in Appendix 2. Observation of Figure 3- 5 demonstrates that the southern portion of the site lies within 0.1% Fluvial AEP event and is considered to be located within **Flood Zone A**. The northern portion of the site lies outside of the 0.1% and 1% AEP fluvial flood extent and within Flood Zone C.

This extract also provides the flood level of the Delvin River at the vicinity of the proposed development site during the 1% and 0.1% AEP fluvial events. At node 18Da4160 immediately to the south of the site, water levels in the river are +18.78mOD, +19.20mOD and +19.61mOD for the 10%, 1% and 0.1% AEP flood events respectively.

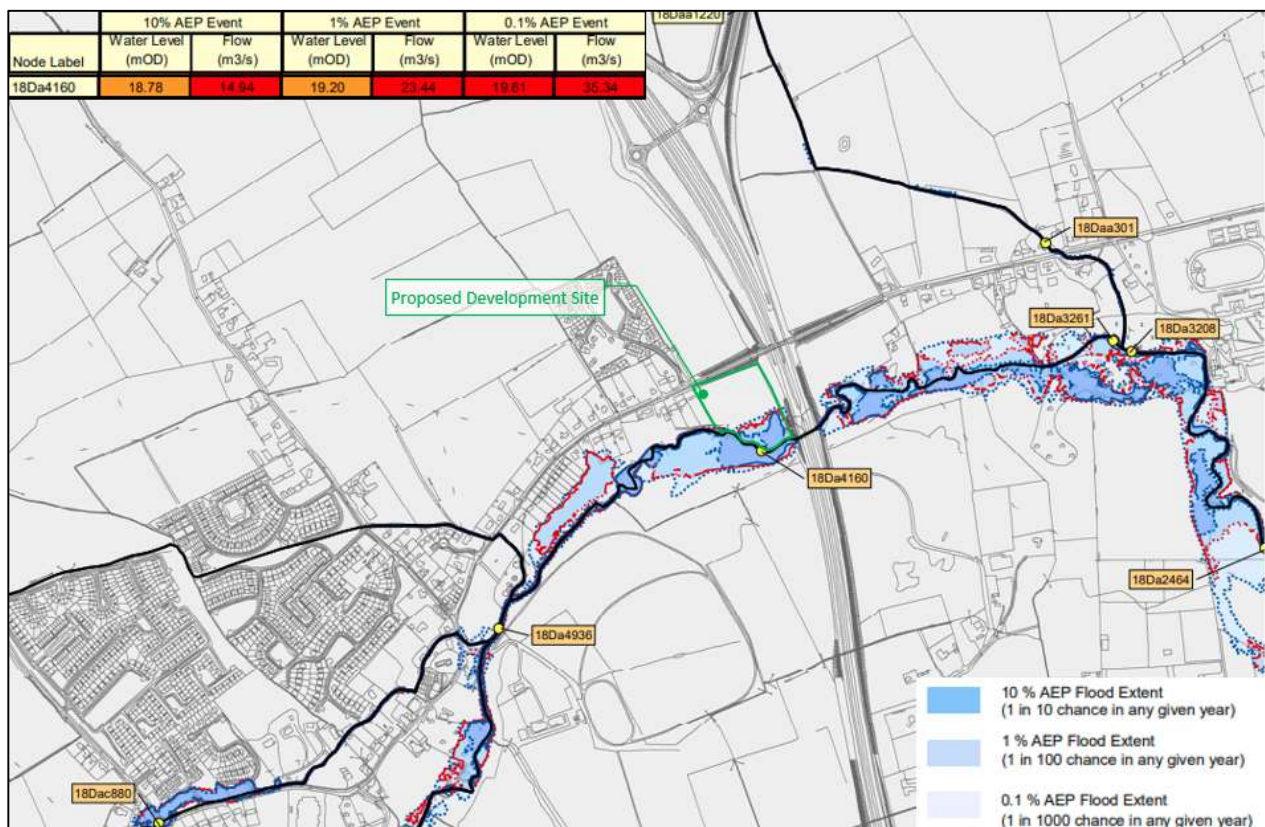


Figure 3-5: extract from CFRAMS Fluvial Flood Extent Map

3.4.3 Meath County Council (MCC) Strategic Flood Risk Assessment

The Meath County Council (MCC) Strategic Flood Risk Assessment (SFRA) was developed as part of the Meath County Council Development Plan 2020-2026. The SFRA provides an area-wide assessment of all types of significant flood risk to inform strategic land use planning decisions. The SFRA enables MCC to allocate appropriate sites for development and identify how flood risk can be reduced as part of the development plan process.

As part of the SFRA flood zone maps were generated for Stamullen. *Figure 3-6* below shows an extract from the Flood Zone Map in the vicinity of the proposed development. Observation of *Figure 3-6* shows that the southern portion of the site lies within Flood Zone A, but the northern portion of the site lies within Flood Zone C. This is consistent with the CFRAMS flood mapping.

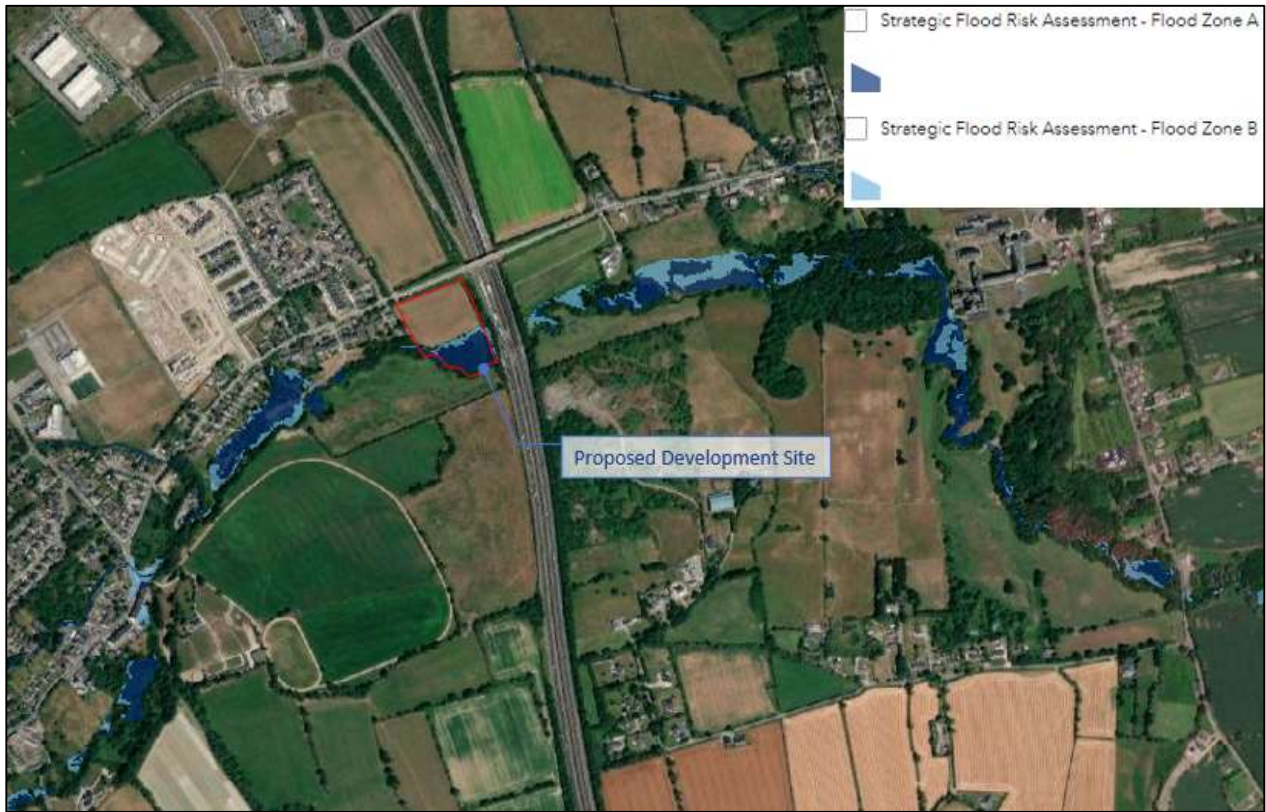


Figure 3-6: Extract from Meath Co Co SFRA Flood Zone Map

SECTION 4: Flood Risk Assessment

4.1 Introduction

As outlined in Section 2 of this report the FRM guidelines identifies three stages of Flood Risk Assessment namely;

- Stage 1: Flood Risk Identification
- Stage 2: Initial Flood Risk Assessment
- Stage 3: Detailed Flood Risk Assessment

4.2 Flood Risk Identification

According to the FRM Guidelines, flood risk identification is the process for deciding whether a plan or project requires further investigation. This is a desk based exercise based on existing information. All the existing information is described in Section 3 and the identification of flood risk from each of the five sources of flooding (coastal, fluvial (river), groundwater, pluvial (rainfall) and from artificial drainage systems) is considered.

Coastal Flood Risk

The CFRAMS map in Appendix 2, and MCC SFRA Map in Figure 3-6 both indicate that the proposed development site lies outside of the 0.1% AEP (Annual Exceedance Probability) coastal flood event and hence is located within **Flood Zone C** for Coastal flood risk, where the risk of flooding is low.

Fluvial Flood Risk

The CFRAMS map in Appendix 2, and MCC SFRA Map in Figure 3-6 both indicate that the southern portion of the site lies within the 1% AEP fluvial flood extent and therefore lies within **Flood Zone A**. Observation of these maps demonstrate that the southern portion of the site is located within Flood Zone A whereas there is no risk of flooding to the northern portion of the site which is located in Flood Zone C. The OPW Summary Local Area Report shows no indication of previous fluvial related flooding at the proposed site.

Groundwater Flood Risk

The aquifer vulnerability map (refer to *Figure 3-3*) classifies the site as having vulnerability rating ranging from low to high which indicates a moderately high water table and hence a risk of groundwater related flooding. Despite this, there is no historical evidence of groundwater flooding at the site. There is no indication on the maps of any springs or wells on this site. Groundwater risk is therefore not considered to be significant.

Pluvial Flood Risk

The OPW Summary Local Area Report shows no indication of previous pluvial related flooding at the site. Pluvial flood risk is therefore not considered to be significant.

Artificial Drainage Systems Flood Risk

There are existing services located onsite relating to surface water infrastructure and a wastewater rising main. These services will not be affected during construction and have never given rise to flooding issues in the past. With this, Artificial Drainage Systems Flood Risk is not considered to be significant.

4.3 Initial Flood Risk Assessment

The Flood Risk Assessment has identified that there is a low flood risk to the site. Under the sequential approach identified in the FRM Guidelines a three-step approach is required to confirm the appropriateness of the development in terms of flood risk.

Step 1: Identification of the Flood Zone at the proposed development site

Using the Flood Zone criteria from the FRM Guidelines and as defined in Section 2 previously, the flood zones for each of the sites were determined.

- **Flood Zone A** – where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 year 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 100 year and 1% or 1 in 1000 year for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 year 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).

As discussed in Section 4.2 above, the southern portion of the proposed development site lies within **Flood Zone A** – where risk of flooding is greatest. The northern portion of the development site lies within Flood Zone C.

Step 2: Identification of the vulnerability of the type of the proposed development (Table 3.1 of the FRM Guidelines)

The different types of proposed infrastructure are then assigned a vulnerability classification according to the definitions in 'Table 3.1 – Classification of vulnerability of different types of development' of the FRM Guidelines.

As described in Section 1.2 above, the proposed development consists of a mixed development. The development on the northern portion of the site is considered 'Less vulnerable development' and the development on the southern portion of the site is considered 'water compatible development'.

Step 3: Using the matrix of vulnerability versus Flood Zone (Table 3.2 of the FRM Guidelines), identify the necessity for the justification test for the proposed development

The proposed development site is located in Flood Zone A and is categorised as both Less Vulnerable Development and Water Compatible development. Table 3.2 of the FRM guidelines and Figure 3.2 – Sequential approach mechanism in the planning process (FRM guidelines) stipulate that a justification test is required for such a development and is deemed appropriate development for the flood zone categories. *Figure 4-1* below highlights the matrix of vulnerability versus flood zone.

	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 3.2: Matrix of vulnerability versus flood zone to illustrate appropriate development and that required to meet the Justification Test.

Figure 4-1: Matrix of Vulnerability versus Flood Zone to illustrate appropriate development.

4.4 Detailed Flood Risk Assessment

Following from Stage 2 – Initial Flood Risk Assessment, it was determined that there is no requirement to undertake a detailed flood risk assessment on the proposed development. The vulnerability matrix as shown in *Figure 4-1* identifies that no Justification Test must be undertaken. However, in order to assess potential increase in flood risk elsewhere and to ensure the development is adequately protected from flood risk a Justification Test was undertaken for the proposed development.

4.4.1 Justification test

According to the FRM Guidelines, the Justification Test has been designed to rigorously assess the appropriateness, or otherwise, of particular developments that are being considered in areas of moderate or high flood risk (Flood Zones A and B respectively). The FRM Guidelines outlines in Box 5.1 (shown in *Figure 4.2*), the five criteria, namely Criterion 1, 2(i), 2(ii), 2(iii), and 2(iv), all of which must be satisfied under the Justification Test as it applies to development management. These justification criteria have been addressed in the following paragraphs.

**Box 5.1 Justification Test for development management
(to be submitted by the applicant)**

When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:

1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates:
 - (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk;
 - (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible;
 - (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and
 - (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes.

The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.

Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.

Figure 4-2: Justification Test of the FRM Guidelines

Criterion 1: The subject land has been designated for this particular use

The proposed development will consist of recreational and amenity open space development and will be built on an existing greenfield site in Stamullen, Co. Meath and will be built within the Meath County Council (MCC) electoral area. The Meath County Council Development Plan 2021 – 2027 defines the proposed development site to be zoned as RA – Rural Area with an objective “to protect and promote in a balanced way, the development of agriculture, forestry and rural-related enterprise, biodiversity, the rural landscape, and the built and cultural heritage”. As the proposed development will consist of a burial

ground, playground and a walkway in a wooded area, it is deemed appropriate to the current zoning. With this, it is considered that the development fulfils Criterion 1 of the Justification Test.

Criterion 2: The proposal has been subject to an appropriate flood risk assessment

To satisfy the four sub criteria (namely 2(i), 2(ii), 2(iii), 2(iv)) under this criterion, as set out in Box 5.1 of the FRM Guidelines, a detailed flood risk assessment has been undertaken.

A detailed and appropriate flood risk assessment has been undertaken under the four sub-criteria of

Criterion 2 of the Justification Test, as described below:

- Sub-criterion 2(i) – Detailed Flood Risk Assessment
- Sub-criterion 2(ii) – Flood Risk Mitigation Measures
- Sub-criterion 2(iii) – Residual Risks
- Sub-criterion 2(iv) – Wider Planning Objectives

Each sub criterion is addressed in the following sections.

Sub Criterion 2(i) – Detailed Flood Risk Assessment

As mentioned above, the southern portion of the proposed development lies within the 0.1% and 1% AEP floodplain of the Delvin River. Development on a floodplain has the potential to increase flood risk elsewhere by:

- Increasing the rate and volume of runoff from reduced permeable areas
- A decrease in the volume of available flood storage

From the CFRAMS mapping in Appendix 2, the 0.1% AEP fluvial flood level was determined to be +19.61mOD. A topographical survey of the site has been undertaken and the results are included in Appendix 3. Observation of the topographical survey in conjunction with the proposed site layout in Figure 1-2 demonstrate that the development of the burial ground, playground incorporating internal roads, a caretaker building and public toilets will be constructed at a level above the 0.1% AEP fluvial flood extent.

It can be seen from the topographical survey that the lowest level at the edge of the woodland area is +19.634mOD and as such it is only the woodland area, walkway and detention/infiltration pond which are due to developed within the 0.1% AEP fluvial flood zone. Therefore, all development categorised as 'less vulnerable development' will take place within Flood Zone C and only 'water compatible development' will occur within Flood Zone A.

It is proposed to construct the infiltration pond to a level of +19.70mOD. This ensures the cover level is above the 0.1% AEP fluvial flood, however as discussed above this development will take place in Flood Zone A and as such will result in a loss of existing flood plain storage. The existing ground level where the infiltration pond is to be developed was found from the topographic survey to be +18.36mOD. The proposed infiltration pond (including necessary embankments) has a total area of 950m². Therefore, the development of the infiltration pond will result in a loss of 1,187.5m³ of the 0.1% AEP fluvial flood plain ((19.61mOD – 18.36mOD) x 950m²).

It is also proposed to build a Stormtech® attenuation unit on site. The attenuation unit will be underground, however there will be embankments built which will result in a loss of the 0.1% AEP fluvial flood plain. The existing ground level where the attenuation unit is to be developed was found from the topographic survey to be +18.91mOD. The area of land enclosed by the embankments is 300m². Therefore, the development of the attenuation unit will result in a loss of 210m³ of the 0.1% AEP fluvial flood plain ((19.61mOD – 18.91mOD) x 300m²). The total volume of flood plain storage lost as a result of the development is 1,397.50m³.

It is proposed to provide compensatory storage for the displaced flood waters on the existing development site equal to the volume of flood plain lost. The remainder of the proposed woodland area (approximately 5,600m²) will be regraded to a level which will provide an overall compensatory volume equalling 1,397.5m³. The exact details of the regrading of the land will be determined during final landscaping designs. The compensatory storage area will remain public open space and will provide adequate storage for flood water during flood events. This proposal is in accordance with the FRM Guidelines Technical Appendices which require that "a volume of flood plain equal to that lost to the proposed development should be created" and will successfully prevent the increase of flood risk elsewhere within the vicinity as a result of the proposed development.

Proposed surface water drainage and the development of an infiltration pond with an effective storage volume of 350m³ to cater for the 1 in 100 year +20% climate change, critical storm event will ensure adequate provisions have been made to prevent an increase in runoff. As the reduction in permeable areas and reduction of volume of flood storage within the 0.1% AEP fluvial flood plain resulting from the development of the wooded area and walkway are minimal, the increase in flood risk elsewhere associated with this development are considered negligible. With this, it is considered that the proposed development satisfies sub-criterion 2(i) of the Justification Test.

Sub Criterion 2(ii) – Flood Risk Mitigation Measures

As discussed above, less vulnerable development will be constructed within the northern portion of the site and within Fluvial Flood Zone C and therefore will not be liable to flood risk. The only development to take place within Flood Zone A is the wooded area, walkway and infiltration/detention pond which is considered water compatible development. The infiltration/detention pond will be constructed with a cover level greater than the 0.1% AEP fluvial flood level to prevent infiltration of flood waters to the pond.

With this, the proposed development satisfies Sub-Criterion 2(ii) of the Justification Test.

Sub Criterion 2(iii) – Residual Risks

To ensure flood risk to people and infrastructure are minimised, the following mitigation measures are recommended:

- Fencing required between the site and the Delvin River which will allow flood waters to enter the wooded area.
- Life buoys to be provided along river bank

With the implementation of flood risk mitigation measures recommended above, it is considered that the risk of flood damage to the proposed infrastructure and to operators will be minimised. It is considered that the proposed development satisfies sub-criterion 2(iii) of the Justification Test.

Sub Criterion 2(iv) – Wider Planning Objectives

The development will address the above measures in a manner that is compatible with the wider planning objectives in relation to the proposed development. Therefore, it is considered that the development also satisfies Sub-criterion 2(iv) of the Justification Test.

SECTION 5: Conclusions and Recommendations

5.1 Summary of Results

A flood risk assessment for the proposed mixed use development at Stamullen, Co. Meath has been undertaken in accordance with the methodology recommended in the FRM Guidelines. The following is the summary of the flood risk assessment:

- The proposed development will consist of a burial Ground & playground incorporating internal roads, a caretaker building with public toilets, and a walkway in a wooded area. The Delvin River is located to the south of the site.
- The national flooding website www.floodinfo.ie does not have any record of historic flooding at the site.
- The CFRAMS fluvial flood extent maps indicates that the southern portion of the site lies within Flood Zone A, and hence is at risk of flooding. Water levels from on the amp indicate that the 1% AEP and 0.1% AEP fluvial flood levels adjacent the site are +19.20mOD and +19.61mOD respectively.
- The type of development is mixed with a portion defined as 'Less Vulnerable Development' and another portion defined as 'Water Compatible development'. Using the sequential approach mechanism, it is assessed that a justification test is not required for the proposed development. To ensure flooding is not increased as a result of this development, a Justification Test was undertaken nonetheless.
- All 'Less vulnerable development' will be built at a level greater than the 0.1% AEP flood level and as such will be constructed in Flood Zone C. Only water compatible development will be constructed within Flood Zone C.
- Adequate compensatory storage will be provided for as a result in the loss of flood plain with development in Flood Zone A.
- Following the protocols as set out in the Justification Test, it was deemed that the development is suitable.

Appendix 1:

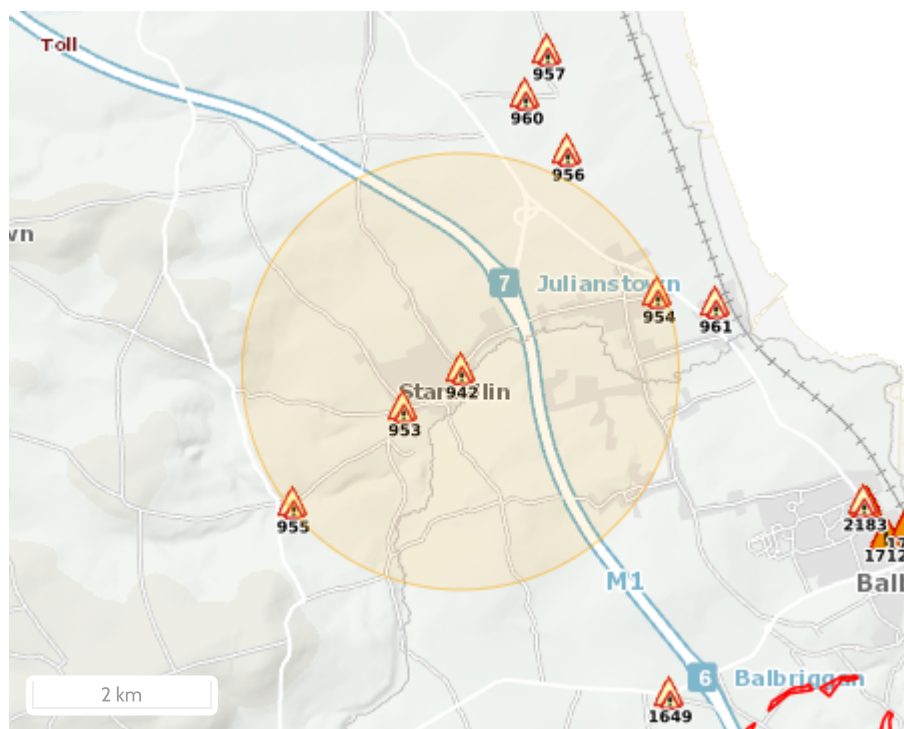
OPW Summary Local Area Reports



Report Produced: 14/4/2023 10:24

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

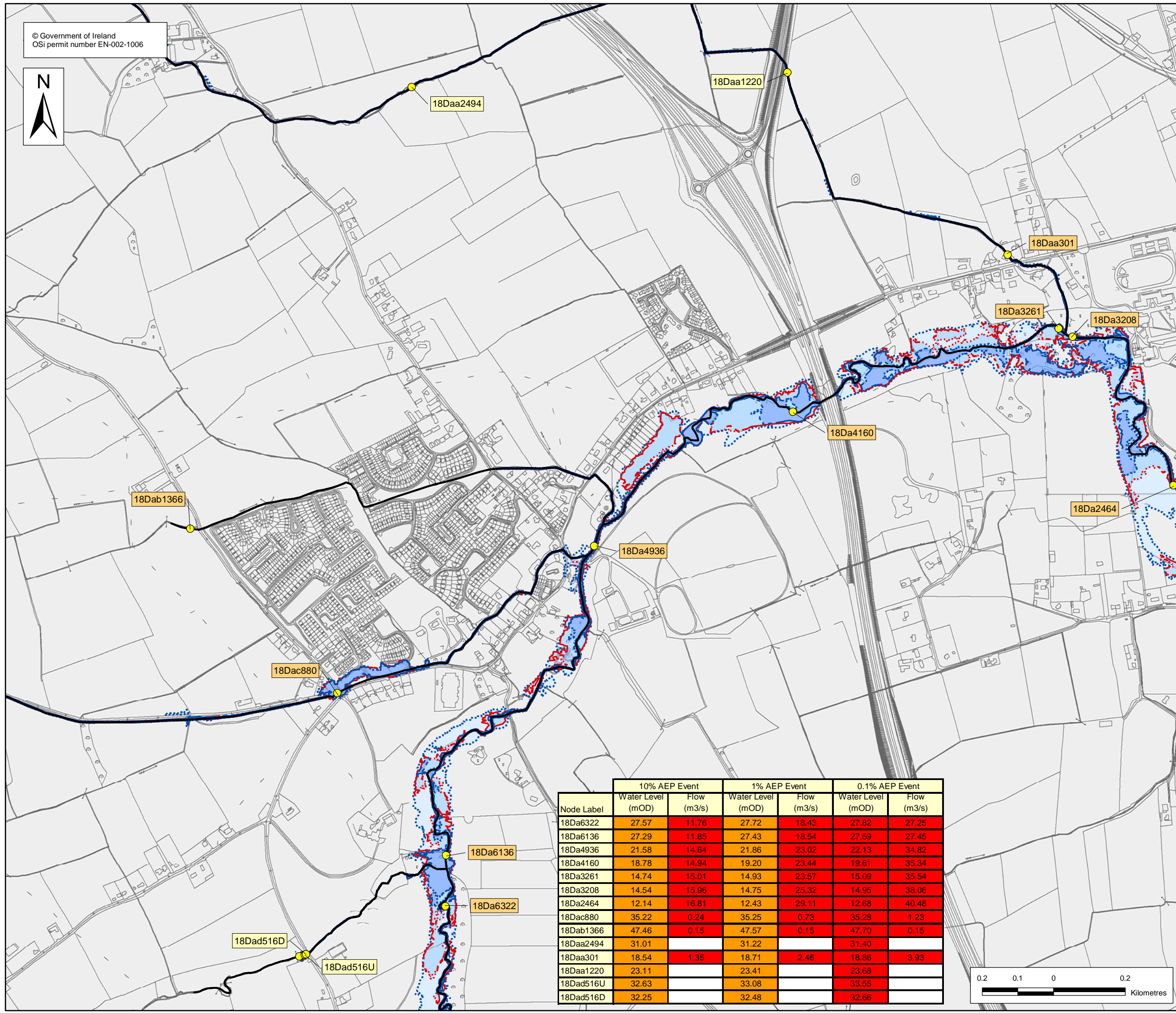
* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

4 Results

Name (Flood_ID)	Start Date	Event Location
1. Delvin Stamullin Recurring (ID-942) Additional Information: Reports (2) Press Archive (0)	n/a	Approximate Point
2. Stamullin Recurring (ID-953) Additional Information: Reports (2) Press Archive (0)	n/a	Approximate Point
3. Martin's Road, Gormanstown Recurring (ID-954) Additional Information: Reports (2) Press Archive (1)	n/a	Approximate Point
4. Clinstown Cross Recurring (ID-955) Additional Information: Reports (2) Press Archive (0)	n/a	Approximate Point

Appendix 2:

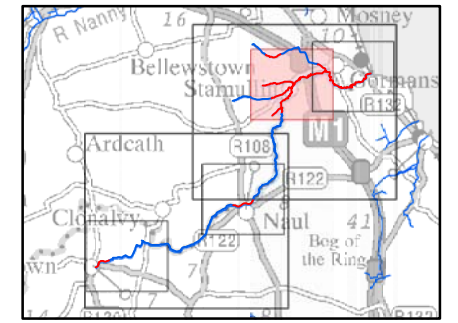
CFRAMS Flood Maps



Node Label	10% AEP Event		1% AEP Event		0.1% AEP Event	
	Water Level (mOD)	Flow (m3/s)	Water Level (mOD)	Flow (m3/s)	Water Level (mOD)	Flow (m3/s)
18Da6322	27.57	11.76	27.72	18.43	27.82	27.25
18Da6136	27.29	11.85	27.43	18.54	27.59	27.45
18Da4936	21.58	14.64	21.86	23.02	22.13	34.82
18Da4160	18.78	14.94	19.20	23.44	19.61	35.34
18Da3261	14.74	15.01	14.93	23.57	15.09	35.54
18Da3208	14.54	15.96	14.75	25.32	14.95	38.06
18Da2464	12.14	16.81	12.43	29.11	12.68	40.48
18Dac880	35.22	0.24	35.25	0.73	35.28	1.23
18Dab1366	47.46	0.15	47.57	0.15	47.70	0.15
18Daa2494	31.01		31.22		31.40	
18Daa301	18.54	1.35	18.71	2.46	18.86	3.93
18Daa1220	23.11		23.41		23.68	
18Dad516U	32.63		33.08		33.55	
18Dad516D	32.25		32.48		32.66	



Location Plan :



EXTENT MAP

Legend:

- 10 % AEP Flood Extent (1 in 10 chance in any given year)
 - 1 % AEP Flood Extent (1 in 100 chance in any given year)
 - 0.1 % AEP Flood Extent (1 in 1000 chance in any given year)
 - Defended area
 - High Confidence (<20m) (10% AEP)
 - Medium Confidence (<40m) (10% AEP)
 - Low Confidence (>40m) (10% and 0.1% AEP)
 - High Confidence (<20m) (1% AEP)
 - Medium Confidence (<40m) (1% AEP)
 - Low Confidence (>40m) (1% AEP)
 - Modelled River Centreline
 - Node Point
 - Node label with level data (refer to table)
 - Node level with flow & level data (refer to table)
- High confidence
 Medium confidence
 Low confidence
- refer to table

USER NOTE:

USERS OF THESE MAPS SHOULD REFER TO THE DETAILED DESCRIPTION OF THEIR DERIVATION, LIMITATIONS IN ACCURACY AND GUIDANCE AND CONDITIONS OF USE PROVIDED AT THE FRONT OF THIS BOUND VOLUME. IF THIS MAP DOES NOT FORM PART OF A BOUND VOLUME, IT SHOULD NOT BE USED FOR ANY PURPOSE.



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Clients :



Project :

FEM FRAMS

Map :

DELVIN MODEL FLOOD EXTENT MAP

Map Type : FLOOD EXTENT

Source : FLUVIAL FLOODING

Map area : HIGH PRIORITY WATERCOURSE

Scenario : CURRENT

Figure By : Mara Ruiz Date : 8 August 2010

Checked By : Sergio Herbón Date : 8 August 2010

Approved By : Clare Dewar Date : 8 August 2010

Figure No. : DEL/HPW/EXT/CURS/003

Revision : 0

Drawing Scale : 1:10,000 Plot Scale : 1:1 @ A3

Appendix 3:

Topographical Survey of the Site

