



OPW Oifig na
nOibreacha Poiblí
Office of Public Works

Flood Map Update

MR096 Monaghan



PROJECT	Flood Map Update – MR096 Monaghan
PROJECT NO.	MR096
PROJECT ENGINEER	Cian Ó Fátharta
DOCUMENT TITLE	MR096 Monaghan Report

REV	STATUS	AUTHOR(S)	REVIEWED	APPROVED	ISSUE DATE
0.1	Draft	CÓF	DW		
0.2	Draft	CÓF	DW		
0.3	Draft	CÓF	DW		
1.0	Final	CÓF	DW	CG	21/11/2025

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1 Map Review Programme

The Map Review Programme is the process that the OPW follows to update predictive flood mapping to continue to provide the best available flood risk information to as wide an audience as possible. The Flood Maps have been developed from detailed engineering analysis and modelling. There is always some uncertainty with regard to the accuracy of predictive flood models; however, the detailed models used have been developed using the best available modelling techniques, tools and data at the time of production.

Updates and revisions to the Flood Maps will be prepared as appropriate. Updates to the Flood Maps are considered when one of the below criteria are met:

- A change in the physical conditions since the Flood Map was produced. Examples of potential changes include new infrastructure, a new development, a culvert or bridge upgrade, land raising, channel realignment, etc.
- An error has been identified in the survey. Errors in the survey may include a channel missing or a channel misaligned, or an error in the surveyed levels used.
- Completion of an OPW-funded Flood Relief Scheme or Minor Works Scheme.
- Evidence presented by a recent flood event that calls into question the published Flood Map.
- The completion of a Strategic Flood Risk Assessment, supported by hydraulic modelling, which produces flood maps that are materially different to the OPW published Flood Map.

The Flood Map Review Programme covers Flood Maps produced by the National Catchment Flood Risk Assessment and Management Programme (CFRAM) and other projects that produce detailed productive flood mapping as published on www.floodinfo.ie. The CFRAM Programme was the principle vehicle to deliver on Ireland's commitments under the EU Floods Directive (2007/60/EC). The EU Floods Directive also requires that the Member States review and if necessary update the flood maps on a six-yearly cycle; the Map Review Programme is the process that satisfies this requirement.

The review of indicative national mapping datasets such as the outputs of the National Indicative Fluvial Mapping and the National Coastal Flood Hazard Mapping are not considered as part of the Map Review Programme.

2 Preliminary Assessment

2.1 Overview

Flood Maps were produced for Monaghan as part of the North-West Neagh Bann (NWNB) CFRAM Study under the National CFRAM programme. The Flood Maps for this location were finalised in 2016 and are informed by topographical survey data captured in 2012.

A flood map review request was submitted by a member of the public suggesting the CFRAM flood extents overestimate flood risk to the Rossmore Factory on the Dublin Rd, Monaghan, H18VX08.

The fluvial flood risk in question is associated with the Killgowan watercourse that flows to the rear of the site, and the Ballymacforban watercourse which joins the Killgowan watercourse downstream of the site. A portion of the Killgowan watercourse is culverted, which includes the rear of the site and under part of the building. The watercourses merge together to form the Mullamurphy watercourse at their confluence 200m downstream of the site. See Figure 1 for an overview of the site location.

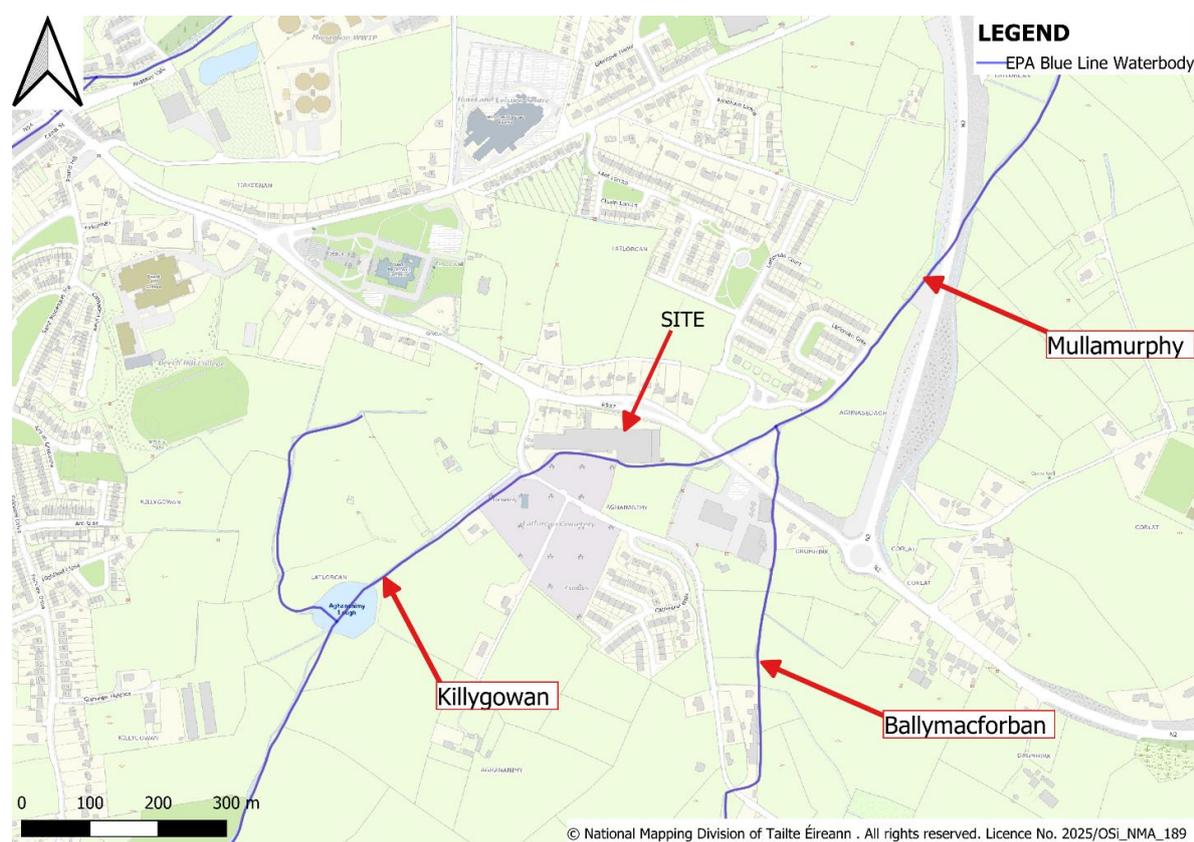


Figure 1: Site Location Overview

The OPW will only carry out a Map Review when the information provided supports one of the criteria described in Section 1. In the case of the Rossmore Factory, an error was identified in the flood extents. The CFRAM flood extents show the entire factory floor area within the flood extent of the current scenario 2% AEP flood and higher magnitude events, despite the factory's finished floor level (FFL) being above the surrounding flood levels.

During the hydraulic modelling for the North Western – Neagh Bann (NWNB) CFRAM, buildings were blocked out so floodwater was unable to flow through them. As part of the post processing of the modelling results, any building that touched a flood extent was then infilled by default. The flood extents for the current scenario 2% AEP and higher magnitude events overlap the factory outline and hence the factory building was infilled and shown to be within these flood extents. See Figure 2 below.

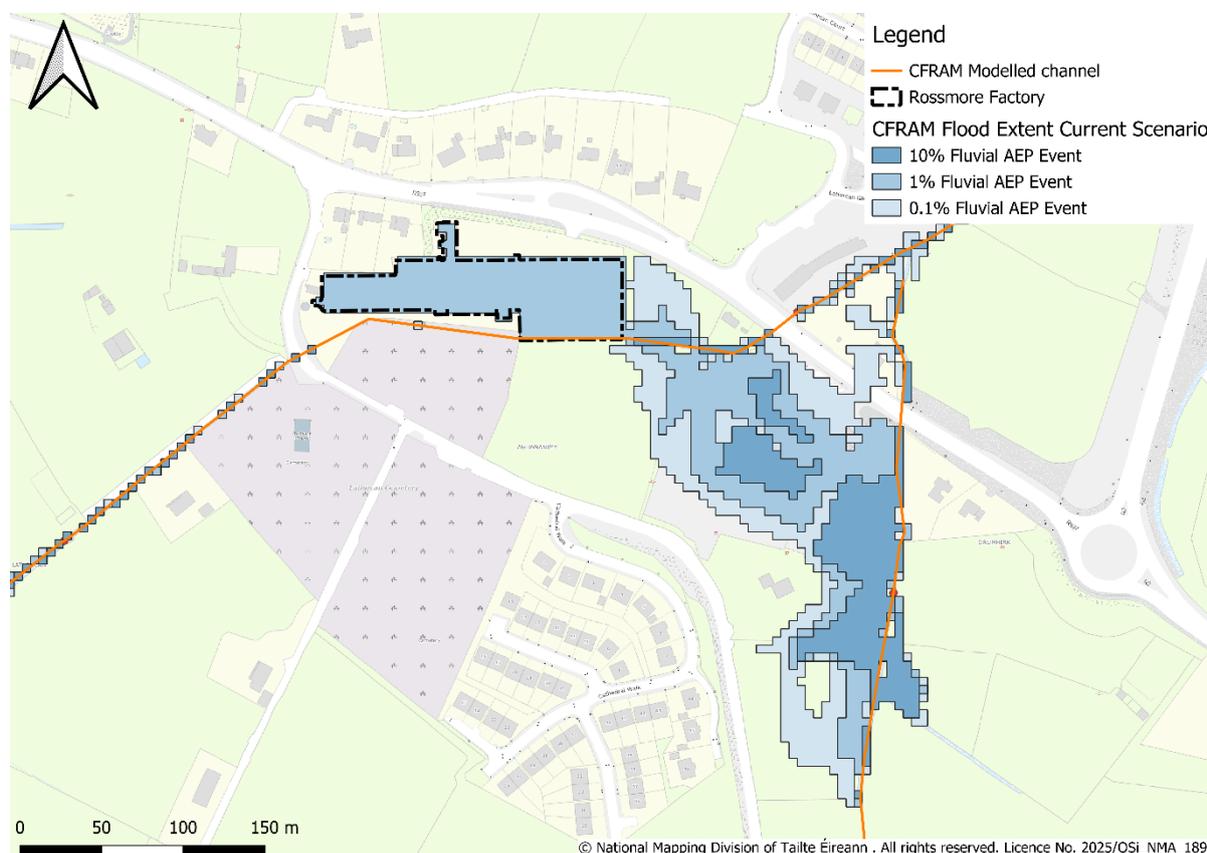


Figure 2: Current Scenario Flood Extents at the Rossmore Factory

The flood extents for the MRFS 10% AEP flood and higher magnitude events overlap the factory outline and hence the building was infilled during post processing and shown to be within the flood extent. See Figure 3. The same goes for all the HEFS events as shown in Figure 4 further below.

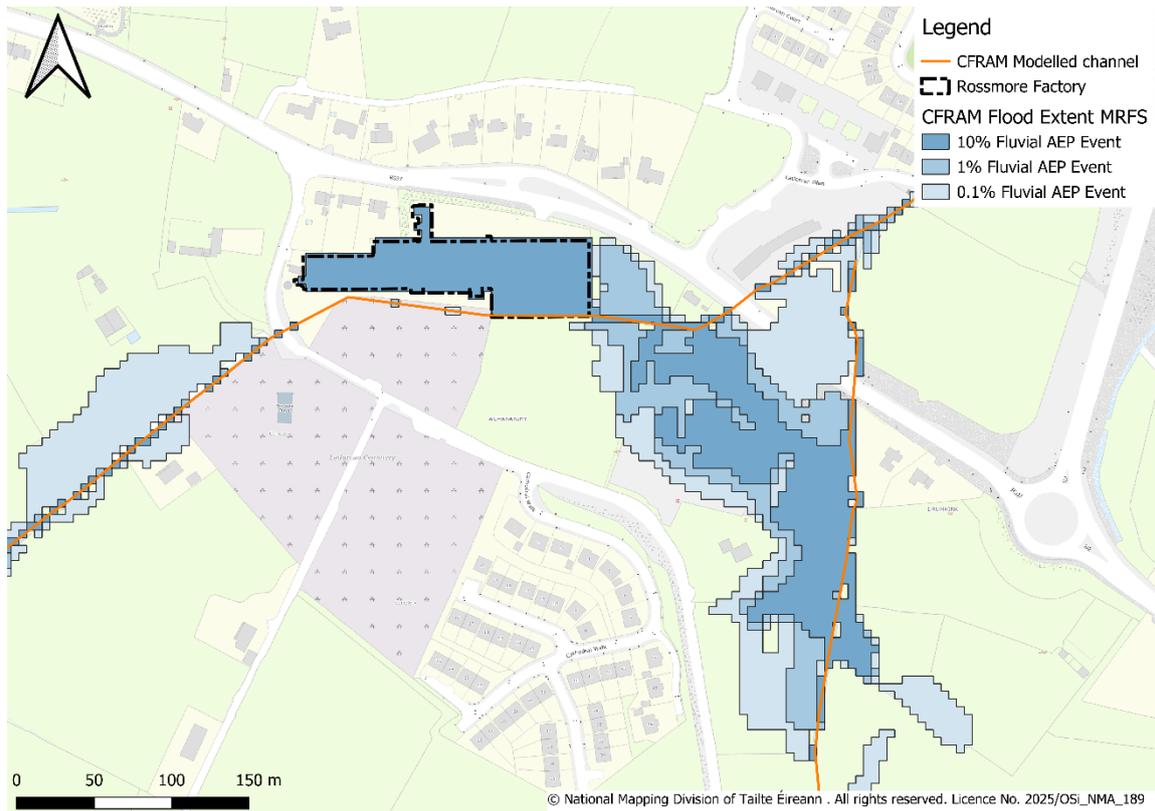


Figure 3: MRFS Scenario Flood Extents at Rossmore Factory

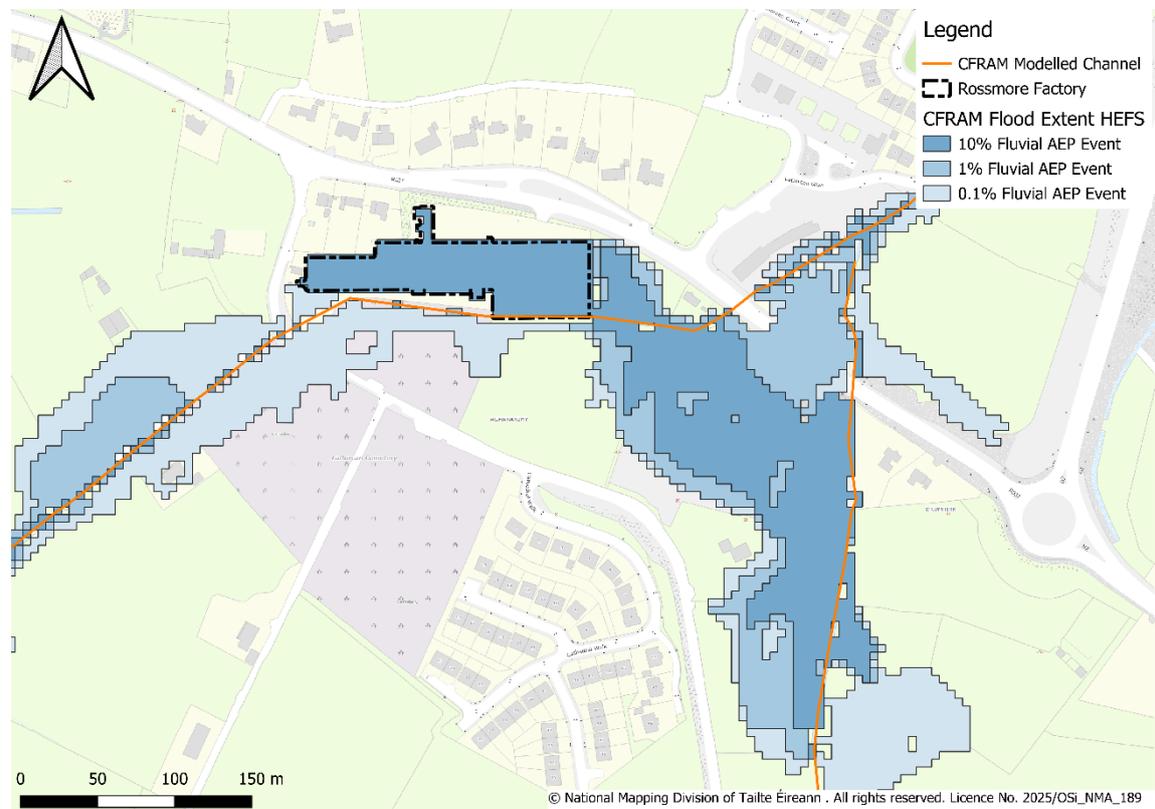


Figure 4: HEFS Scenario Flood Extents at Rossmore Factory

3 Data Review

3.1 Topographical Survey

As part of the Map Review request application, an Initial Flood Risk Assessment Report completed by an engineering consultant on the factory, was submitted as additional information. The topographical survey shows the lowest FFL to be at **65.45m.O.D.**

3.2 Summary of CFRAM model

The NWNB CFRAM Study developed a fluvial hydraulic model for Monaghan. The Monaghan model was divided into two parts: Model A, which includes the Monaghan Blackwater River and a number of its tributaries and Model B, which includes the Killygowan watercourse and its tributaries. MIKE software was the hydraulic modelling software used.

A review of the CFRAM flood levels immediately downstream from the factory shows that they do not reach the factory FFL of 65.45m.O.D, as shown in Table 1. Therefore, the flood risk posed in the adjacent field does not justify the factory floor to be included in the flood extent for any of the Current Scenario, MRFS, or the HEFS events.

Table 1: Flood levels at the south-east corner of the factory

Scenario	AEP (%)	Max flood level (m.O.D)
Current	50%*	63.17
Current	20%*	63.17
Current	10%*	63.17
Current	5%*	63.28
Current	2%	63.42
Current	1%	63.60
Current	0.5%	63.90
Current	0.1%	64.41
MRFS	50%*	63.17
MRFS	20%*	63.32
MRFS	10%	63.38
MRFS	5%	63.53
MRFS	2%	63.91
MRFS	1%	64.09
MRFS	0.5%	64.31
MRFS	0.1%	64.52
HEFS	10%	63.94
HEFS	1%	64.50
HEFS	0.1%	64.63

* Factory floor not shown to be flooded in the original CFRAM flood maps

A further assessment was completed on the flood risk posed by the Killygowan stream upstream of the factory. The maximum flood levels immediately upstream of the factory are shown in Table 2. It can be seen that the maximum flood level for the HEFS 0.1% AEP event

exceeds the factory's FFL of 65.45 m.O.D. Therefore, the factory floor area will remain within the flood extent for this event. However, for the rest of the flood events where the max flood levels were below the FFL of the factory, the factory floor area will be removed from the flood extent and depth maps.

Table 2: Maximum flood levels at the south-west corner of the factory

Scenario	AEP (%)	Surface Elevation (m.O.D)
Current	50%*	64.72
Current	20%*	64.72
Current	10%*	64.72
Current	5%*	64.72
Current	2%	64.81
Current	1%	64.87
Current	0.5%	64.92
Current	0.1%	65.23
MRFS	50%*	64.72
MRFS	20%*	64.79
MRFS	10%	64.86
MRFS	5%	64.92
MRFS	2%	65.00
MRFS	1%	65.08
MRFS	0.5%	65.33
MRFS	0.1%	65.38
HEFS	10%	64.99
HEFS	1%	65.28
HEFS	0.1%	66.44

* Factory floor not shown to be flooded in the original CFRAM flood maps

3.3 Updates to the CFRAM maps

The CFRAM flood extent and depth maps were updated for the Rossmore Factory in Monaghan. The GIS data was updated by cutting out the factory floor area from the relevant flood extents and depths. The flood events for which the factory floor area was removed from the flood extents and depth results are listed in Table 3.

Table 3: CFRAM flood events where flooding to the factory floor area has been removed

Scenario	AEP (%)
Current	2%
Current	1%
Current	0.5%
Current	0.1%
MRFS	10%
MRFS	5%
MRFS	2%
MRFS	1%

MRFS	0.5%
MRFS	0.1%
HEFS	10%
HEFS	1%

The flood events that did not warrant correction are outlined in Table 4. No changes in these flood extents are due either to the factory floor area not being in the CFRAM flood extents to begin with, or the maximum flood level does exceed the FFL of 65.45m.O.D.

Table 4: CFRAM flood events that required no updates.

Scenario	AEP (%)
Current	50%
Current	20%
Current	10%
Current	5%
MRFS	50%
MRFS	20%
HEFS	0.1%

Figure 5 displays a comparison between the original CFRAM flood extents and the updated flood extents for the current scenario. This shows the factory floor area now omitted from the relevant flood extents.



Figure 5: Side by side comparison of the original and updated Current Scenario 10%, 1% & 0.1% AEP fluvial flood maps

4 Conclusion

The CFRAM fluvial flood maps have been updated by removing the Rossmore Factory from the relevant flood extent and depth maps. By reviewing the maximum flood levels produced by the CFRAM hydraulic model, it was determined that the flood levels surrounding the factory did not justify the inclusion of the factory floor in all flood scenario extents, with the exception of the HEFS 0.1% AEP event. The updated flood maps can be viewed on www.floodinfo.ie.