



SWRBD CFRAM Study

Flood Risk Review Report



February 2012
Office of Public Works

SWRBD CFRAM Study



Flood Risk Review Report

February 2012

Office of Public Works

Jonathan Swift Street
Trim
Co. Meath

Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	December 2011	T. Donovan	B. O'Connor	F. McGivern	Initial Issue
B	February 2012	T. Donovan	 B. O'Connor	 F. McGivern	Revised following Stakeholder Consultation

This document is issued for the party which commissioned it and for specific purposes connected with the above-captioned project only. It should not be relied upon by any other party or used for any other purpose.

We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties

This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.

Content

Chapter	Title	Page
	Glossary	i
1.	Introduction	1
1.1	General	1
1.2	Background	1
1.2.1	Preliminary Flood Risk Assessment	1
1.2.2	PFRA Approach	1
1.2.3	Probable and Possible AFA's	2
1.3	Flood Risk Review	2
2.	Flood Risk Review - Methodology	6
2.1	General	6
2.2	Desktop Study	6
2.2.1	Review of PFRA Outputs	6
2.2.2	Data Collection – Historical Flood Events	6
2.2.3	Consultation	7
2.3	Site Inspection	7
2.3.1	Site Inspection Training	7
2.3.2	Quality Assurance & Consistency of Reporting	7
2.3.3	Site Inspections	7
3.	Environmental Flood Risk Review	9
3.1	General	9
4.	Recommendations	16
4.1	General	16
	Appendices	19
	Appendix A. Site Inspection Reports	20

Glossary

AEP	Annual Exceedence Probability – this represents the probability of an event being exceeded in any one year and is an alternative method of defining flood probability to ‘return periods’. The 10%, 1% and 0.1% AEP events are equivalent to 10-year, 100-year and 1000-year return period events respectively.
AFA	Areas for Further Assessment – Areas where, based on the Preliminary Flood Risk Assessment and the CFRAMS Flood Risk Review, the risks associated with flooding are potentially significant, and where further, more detailed assessment is required to determine the degree of flood risk, and develop measures to manage and reduce the flood risk.
ARR	Area for Flood Risk Review – an appraisal of the output from the PFRA involving on site verification of the predictive flood extent mapping, the receptors and historic information.
CAR	Community at Risk
CFRAM	Catchment Flood Risk Assessment and Management – The ‘CFRAM’ Studies will develop more detailed flood mapping and measures to manage and reduce the flood risk for the AFAs.
FRI	Flood Risk Index – a metric that allows the risk to different types of assets (e.g., home, business, monument, utility asset, etc.) to be expressed numerically, but without attempting to assign monetary values to all types of damage.
FRR	Flood Risk Review – an appraisal of the output from the PFRA involving on site verification of the predictive flood extent mapping, the receptors and historic information.
HA	Hydrometric Area
PFRA	Preliminary Flood Risk Assessment – A national screening exercise, based on available and readily-derivable information, to identify areas where there may be a significant risk associated with flooding.

1. Introduction

1.1 General

Mott MacDonald Ireland Ltd. have been appointed by the Office of Public Works (OPW) to undertake the Catchment Flood Risk Assessment and Management (CFRAM) Study for the South Western River Basin District. As part of this study, Mott MacDonald Ireland Ltd. are required to review the outputs of the initial national Preliminary Flood Risk Assessment (PFRA).

This process involves carrying out Flood Risk Review's (FRR) of areas designated as Areas for Further Assessment (AFA) under the PFRA. This report lists the AFA's within the South Western CFRAM, details the FRR process and provides recommendations on the designation of each of the AFA's.

Sections 2.0 and 3.0 detail the process / methodology adopted for carrying the Flood Risk Reviews. Section 4.0 outlines the findings and recommendations from the Flood Risk Reviews. Site Inspection Reports and revised preliminary flood extent maps for each of the AFA's are included in Appendix A.

A brief background to the PFRA and CFRAM Study is provided in the following section.

1.2 Background

1.2.1 Preliminary Flood Risk Assessment

The Office of Public Works (OPW) has undertaken a Preliminary Flood Risk Assessment (PFRA), a national screening exercise, based on available and readily-derivable information, to identify areas where there may be a significant risk associated with flooding.

These areas identified as part of the PFRA, referred to as Areas for Further Assessment (AFA's), are where more detailed assessment may be undertaken to more accurately assess the extent and degree of flood risk, and where the risk is significant, to develop where possible, measures to manage and reduce the risk.

The more detailed assessment that will focus on the AFA's will be undertaken through Catchment Flood Risk Assessment and Management (CFRAM) Studies.

1.2.2 PFRA Approach

As mentioned above, the PFRA identified areas where the risk due to flooding might be potentially significant and designated these areas AFA's. The PFRA approach to designating an area an AFA was carried out under the following guiding principles:

1. Historic Analysis: The historic flood risk assessment indicates that a location has a historic hazard or risk category of 4
2. Predictive Analysis: The predictive flood risk assessment indicates that a location has a community Flood Risk Index in excess of 250, or where an individual receptor has an Index in excess of 250 and is deemed to be of strategic, national importance or be critical in the event of a major regional emergency (such as a power station, international airport or hospital)

3. Consultation: Information has been provided through consultation that clearly indicates that an area is subject to severe flood risk that is beyond the capacity or responsibility of the Local Authority or other responsible body to manage locally.

1.2.3 Probable and Possible AFA's

The PFRA defined AFA's as probable or possible. This reflects the preliminary nature of the PFRA, and the need to take into account the outcomes of the consultation. All of the provisional AFA's are subject to validation (Flood Risk Review) during site-visits. Subject to the outcomes of the validation and consultation it was foreseen that:

- **Probable AFA's** are intended to be designated as AFA's, and hence subject to further assessment through the CFRAM Studies, unless information arises to indicate that this should not be the case.
- **Possible AFA's** would not be designated as AFA's, unless information arises to indicate that this should not be the case. These are areas where the degree of risk does not indicate that the area should be designated as an AFA, but where there is some degree of risk and where sites visits and consultation are required to validate the risk. It is also important to note that if an area is not designated as an AFA, then that area is not excluded from any further action to address flood risk, and works to reduce or manage the flood risk could still be considered through channels other than the CFRAM Programme.

1.3 Flood Risk Review

As part of the South Western RBD CFRAM Study, Flood Risk Reviews were required for 68 Nr.¹ AFA's (23 Nr. Probable AFA's and 45 Nr. Possible AFA's). In the Project Brief for the South Western RBD CFRAM Study the Probable AFA's are referred to as Communities at Risk (CAR) and the Possible AFA's are referred to as Areas for Flood Risk Review (ARR). It should be noted that the PFRA identified additional AFA's within the South Western RBD. However, these are covered by separate studies. Details of the AFA's are provided on the following tables:

¹ Ballingeary was not included in the brief, added as Probable AFA during the Flood Risk Review.

Table 1.1 – Probable Area for Further Assessment

Name	Unique ID	County	Easting	Northing
Ballyduff	180248	Waterford	196500	99500
Castlelyons	180250	Cork	184000	92750
Fermoy	180252	Cork	182750	99500
Freemount	180253	Cork	139500	114250
Kanturk	180254	Cork	138250	102750
Mallow	180262	Cork	155250	98500
Rathcormack	180265	Cork	181750	91000
Tallow	180266	Waterford	199750	93750
Youghal	180267	Cork	210250	78750
Castlemartyr	190277	Cork	196250	73250
Ballingeary*	195499	Cork	115090	67135
Clonakilty	200294	Cork	138000	41250
Dunmanway	200297	Cork	122250	52750
Inishannon	200298	Cork	155000	57000
Schull	200303	Cork	92500	31500
Bantry	210307	Cork	99750	48500
Durrus	210309	Cork	95000	42000
Kenmare	210312	Kerry	90750	70500
Castlemaine	220324	Kerry	83500	103000
Dingle	220327	Kerry	44500	101000
Killarney	220337	Kerry	97000	90500
Killorglin	220338	Kerry	77500	96000
Milltown	220339	Kerry	82500	101000

* Ballingeary was not included in the brief, added as Probable AFA during the Flood Risk Review.

Table 1.2 – Possible Area for Further Assessment

Name	Unique ID	County	Easting	Northing
Aglish	180247	Waterford	212250	91500
Cappoquin	180249	Waterford	210000	99500
Clashmore	180251	Waterford	212500	84250
Killavullen	180256	Cork	164750	99750
Lismore	180260	Waterford	204750	99000
Mitchelstown	180263	Cork	182250	112500
Twopothouse	180264	Cork	153750	103750
Buttevant	182269	Cork	154256	109254
Rathmore	182363	Kerry	116493	93258
Coachford	190273	Cork	145750	73250
Killeagh	190274	Cork	200750	75750
Ladysbridge	190275	Cork	197500	72250
Mogeely	190276	Cork	196500	75750
Carrigtwohill	192399	Cork	182035	73393
Dromanallig	192424	Cork	114315	67100
Dromore School	200295	Cork	106000	45750
Dunderrow	200296	Cork	159250	52750
Ross Carbery	200301	Cork	128750	36750
Ardcahan	202474	Cork	125389	56541
Black Ball Head	210304	Cork	58500	40000
Castletown Bearhaven	210308	Cork	68000	46000
Kealkill	210311	Cork	104500	56250
Kilcrohane	210313	Cork	82250	37750
Templenoe	210315	Kerry	82750	69500
Sneem	212577	Kerry	69075	66940
Innisfallen Abbey	220316	Kerry	93250	89250
Boolteens	220320	Kerry	79000	104000
Castleisland	220323	Kerry	97750	110000
Coolroe Lower	220325	Kerry	65500	89000
Cordal	220326	Kerry	104500	109000
Faha West	220329	Kerry	87750	96500
Farranfore	220330	Kerry	94000	104500
Fieries	220331	Kerry	91500	103250
Glenbeigh	220333	Kerry	66250	91000
Gortnacarriga	220335	Kerry	95750	95500
Kilfarnoge	220336	Kerry	38000	98000
Portmagee	220340	Kerry	36500	73000
Anascaul	222579	Kerry	59397	101791
Ballymalis	222583	Kerry	84222	94958
Cromane	222594	Kerry	69976	96440
Curreal	222595	Kerry	106553	85933
Derreenacullig	222596	Kerry	107739	80874
Rossbehy	222623	Kerry	64828	92434

Name	Unique ID	County	Easting	Northing
Glenflesk	225502	Kerry	106621	85316
Fossa	225503	Kerry	91919	92102

Table 1.3 – Probable AFA's within SW Region Covered by Other Studies

Name	Unique ID	Study	Easting	Northing
Midleton	160279	Lee CFRAM Study	188230	73520
Macroom	190270	Lee CFRAM Study	134100	72900
Tower	190280	Lee CFRAM Study	158250	73750
Little Island	190284	Lee CFRAM Study	175250	72499
Cork City	190286	Lee CFRAM Study	167270	72010
Togher	190288	Lee CFRAM Study	166500	69000
Carrigaline	190289	Lee CFRAM Study	173055	62418
Glanmire / Sallybrook	190290	Lee CFRAM Study	172500	73750
Douglas	190291	Lee CFRAM Study	170750	69500
Ballymakeery	190292	Lee CFRAM Study	120250	77000
Ballyvourney	192389	Lee CFRAM Study	119970	77602
Blarney	192392	Lee CFRAM Study	161111	76180
Cobh	192407	Lee CFRAM Study	179420	66626
Crookstown	192414	Lee CFRAM Study	142597	66085
Bandon	200293	Local Study	149250	54500
Skibbereen	200302	Local Study	112000	33500
Crossbarry	N/A	Lee CFRAM Study	155500	61100
Ballincollig	N/A	Lee CFRAM Study	159740	70620
Kilumney	N/A	Lee CFRAM Study	154830	68710
Crosshaven	N/A	Lee CFRAM Study	179920	61320
Glouthaune	N/A	Lee CFRAM Study	176800	73400
Rostellan / Aghada	N/A	Lee CFRAM Study	185600	64800

2. Flood Risk Review - Methodology

2.1 General

The Flood Risk Review process aims to ensure that the final designation of AFA's, which are taken forward (Probable AFA's) for the more detailed assessment of the CFRAM Study, are verified on site and take full account of local data. The process adopted for the Flood Risk Reviews is outlined below.

2.2 Desktop Study

Prior to any site visits a desktop study for each of the AFA's was carried out. This work included a review of the PFRA outputs, data collection for Historical Flood Events and consultation with relevant stakeholders such as Local Authorities and service providers.

2.2.1 Review of PFRA Outputs

The PFRA identified areas at risk of flooding and designated these areas as AFA's (Probable or Possible). This was achieved using the three approaches highlighted in Section 1.2.2 (Historic, Predictive and Consultation). The predictive approach used to identify AFA's utilised predicted flood outlines overlain with receptor datasets which allowed for flood risk to be measured using a Flood Risk Index.

As part of the desktop study, each part of the predictive approach was reviewed. The predicted flood outlines were produced nationally for various return periods for fluvial and coastal flooding. For each AFA these outlines were overlain on OSI maps. This allowed for a preliminary assessment of the outlines against the topography to identify any errors or anomalies. Anomalies such as wedges in the outlines or areas where the 10% AEP exceeded say the 1% AEP were also identified and marked for inspection on site.

Following the review of the predicted flood outlines, the receptors were overlain on OSI maps and locations were verified where possible (i.e. Schools, Hospitals, Fire Stations, Garda Stations etc.).

The FRI score for each AFA was then reviewed and broken down into the contributing receptors. Through the predicted flood outlines, receptor datasets and OSI maps the FRI scores were reviewed. Where any errors or issues were identified, these were noted for specific inspection on site.

2.2.2 Data Collection – Historical Flood Events

As part of the PFRA the OPW gathered historical information in relation to flood events and carried out a historical analysis. For the Flood Risk Reviews, the relevant historical analysis for each AFA was examined. Further to the information made directly available from the OPW, the OPW website www.floodmaps.ie was searched in relation to each AFA. From the website all available information was downloaded and reviewed, including newspaper articles, photographs, correspondence, reports, maps etc.

This information was cross referenced against the predicted flood outlines. Areas identified as being at risk from flooding due to historical information, but not highlighted within the flood outlines were recorded and noted for further examination on site and during consultation.

2.2.3 Consultation

During the desk top study the relevant Local Authorities were contacted to advise of the CFRAM Study, the Flood Risk Reviews and to request contact details of the relevant person to discuss flooding issues with for each of the AFA's. Consultations / discussions were held with Local Authority personnel during the desktop study and/or during the sites visits. The information received from during these consultations / discussions was reviewed and included in the Flood Risk Review.

2.3 Site Inspection

2.3.1 Site Inspection Training

To ensure the adequacy and consistency of the site inspections, each of the Surveyors underwent specific Site Inspection Training. This training was carried out over 2 days and detailed the process of the PFRA including the approach adopted in the Flood Risk Index scoring and the designation of the AFA's. The training included information on the CFRAM Study outlining the information required for the detailed assessment of the AFA's taken forward.

The Site Inspection Training also involved the Surveyors shadowing during two Site Inspections. In addition, each Surveyor was accompanied on at least one site visit and their inspection was reviewed and assessed. If additional training was required it was provided.

2.3.2 Quality Assurance & Consistency of Reporting

To ensure the quality and consistency of the Site Inspection Reports, each Surveyor was provided with a camera, laptop computer and mobile internet connection. Following the completion of the site inspection, the Surveyors completed the Site Inspection Report and emailed the report along with photographs back to the office for review. This ensured consistency between the reports and that any errors or issues could be addressed while the Surveyor was still on site.

2.3.3 Site Inspections

A Site Inspection of an AFA was only carried out after the desktop survey was completed. This ensured that the Surveyor was aware of any historical flood events, key receptors and any other issues with the site.

The first priority of the site inspection was to verify the predicted flood outlines for the AFA. This involved the Surveyor walking the site and identifying any errors or anomalies in the flood outlines. The extents of the flood outlines were reviewed based on the topography of the site. Where modifications were required to the predicted flood outlines, the outlines were modified on a hardcopy on site. The changes were later recorded digitally. Where receptors were included or removed from the flood outlines as a result of any on site modifications, these were recorded so the appropriate adjustments could be made to the FRI score at the reporting stage.

Following the predicted flood outlines, the receptors and FRI score were reviewed. The location of the receptors were verified and inspected to determine if the receptors are at risk. In some cases receptors within the flood outlines were found to be raised well above the flood level.

Where key receptors such as schools, hospitals, fire stations etc. were identified during the desktop study, the location of these were verified on site. Key receptors were also inspected for the presence of any flood

defences. Where possible, discussions were held with persons responsible for key receptors and this information was recorded in the Site Inspection Report.

In addition to identifying and reviewing known receptors, any unknown receptors identified within the flood outlines (i.e. new housing estates, health centres, flood defences, etc.) were recorded and photographed. From the FRI and the vulnerability classification, scores for the additional receptors were determined and included in the overall FRI score for the AFA.

On site, discussions were held with landowners, business owners, persons responsible for key receptors etc. Any anecdotal evidence was recorded and included in the Site Inspection Reports. Also, any evidence of flooding such as sand bags, barriers, high water marks etc. were recorded.

Following completion of the Site Inspection, the Site Inspection Report was prepared. The preparation of the report involved the recalculation of the FRI score for the AFA including any adjustment. Based on the revised FRI score the town was designated an AFA or Non-AFA.

Copies of the Site Inspection Reports are included in Appendix A.

3. Environmental Flood Risk Review

3.1 General

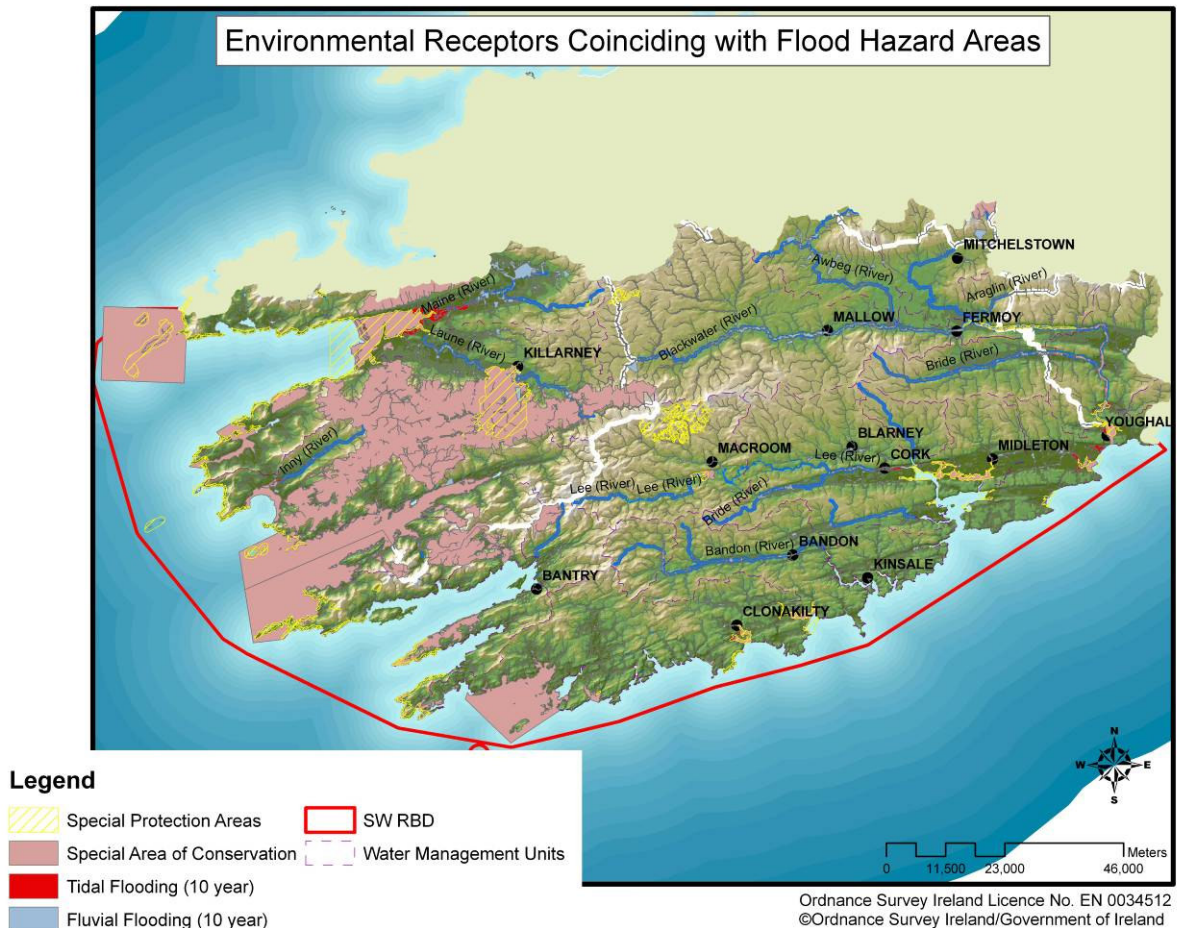
Flood risk levels for environmental receptors may be estimated by examining the vulnerability of the environmental receptor (i.e. Special Protection Areas - SPA and Special Areas of Conservation - SAC) against the probability of a flood event.

The methods used for defining the environment receptor vulnerability are contained in the OPW Report *Flood Vulnerability Assessment of Natura 2000 Sites Volume I: Method Statement* (July 2011). The environmental receptors were assigned to one of 5 vulnerability classifications (low, moderate, high, extreme and critical) on the basis of their susceptibility to damage by inundation. In the case of SACs, consideration was not given to the likelihood of inundation occurring (i.e. flood hazard). The method of vulnerability classification for SPAs did however consider to a degree the potential for inundation i.e. a lower risk classification was allocated to SPAs where the qualifying interests were bird species that breed and nest in areas of high ground unlikely to flood. A direct comparison between flood event data and the environmental receptors was not however carried out at the time of vulnerability classification.

In order to determine flood risk levels for environmental receptors, Geographical Information System (GIS) computer software was used to map the SPAs and SACs located within the South West against the PFRA flood event outlines sourced from the OPW.

Automated procedures in the GIS facilitated the identification of environmental receptors that are located in areas subject to flooding. While some receptors were identified as being 'vulnerable' to flooding in the OPW report, they are not regarded as being at flood risk due to their location outside of the flood hazard boundaries. The environmental receptors located in fluvial flood hazard areas and tidal flood hazard areas are shown in Figure 3.1.

Figure 3.1 – Environmental Receptors Coinciding with Flood Hazard Areas



The environmental receptors located in flood hazard areas were allocated a flood risk index score in accordance with the matrix provided in Table 3.1. Those environmental receptors identified as having a Flood Risk Index (FRI) score which is in excess of 250 (as derived through the assessment of vulnerability against flood hazard) are classified as Area for Further Assessment (AFA's).

Table 3.1 – Matrix for Determining Flood Risk Index

Vulnerability Class	Vulnerability Class Factor	Probability of Flood Event (Annual Exceedance Probability)		
		10% - High	1% - Medium	0.1% - Low
Critical Vulnerability	2500	25000	2500	250
Extreme Vulnerability	250	2500	250	25
High Vulnerability	25	250	25	2.5
Moderate Vulnerability	2.5	25	2.5	0.25
Low Vulnerability	1	10	1	0.1

Of the Special Protection Areas identified as being subject to fluvial and tidal flood hazard, none had a vulnerability classification of greater than 'high' (i.e. a FRI >250) and are therefore are not included for further assessment.

Of the Special Areas of Conservation identified as being subject to fluvial and tidal flood hazard, the following were allocated a FRI score of greater than 250:

Table 3.2 – SAC with FRI Score > 250

Site Code	Site Name	Fluvial	Tidal
000090	Glengarriff Harbour And Woodland	Yes	Yes
000335	Ballinskelligs Bay And Inny Estuary	Yes	Yes
000343	Castlemaine Harbour	Yes	Yes
000353	Old Domestic Building, Dromore Wood	Yes	Yes
000364	Kilgarvan Ice House	Yes	No
000365	Killarney National Park, Macgillicuddy'S Reeks And Caragh River Catchment	Yes	Yes
001342	Cloonee And Inchiquin Loughs, Uragh Wood	Yes	Yes
002158	Kenmare River	Yes	Yes
002170	Blackwater River (Cork/Waterford)	Yes	Yes
002173	Blackwater River (Kerry)	Yes	No
002315	Glanlough Woods	Yes	No

The vulnerability classification for environmental receptors assumed equal probability of flooding across the full extent of all designated areas. In order to further validate the Flood Risk Index for the above-listed SACs, Mott MacDonald conducted a further examination of the SAC vulnerability classification dataset in order to determine the rationale for the 'Extreme' classification and to compare this against the flood extents while having regard to available data from the NPWS and Biodiversity mapping website (www.maps.biodiversityireland.ie) on species and habitat locations. The Flood Risk Index was subsequently amended to reflect the examination and to account for the expert opinion sought.

The Cloonee And Inchiquin Loughs, Uragh Wood (site code: 001342) was deemed not to require further assessment on the basis that the site was allocated an 'Extreme' vulnerability classification due to the presence of Lesser Horseshoe Bat (*Rhinolophus hipposideros*). This SAC is subject only to fluvial flooding in a minor section of the designated area which is not likely to impact on bat roosting.

Probable Areas for Further Environmental Assessment (AFEAs) have been identified as follows and are shown in Figure 3.3 below:

Table 3.3 – Probable Areas for Further Environmental Assessment

Site Code	Site Name	Reason for Extreme Classification	Rational for FRI
000343	Castlemaine Harbour	Petalwort (<i>Petalophyllum ralfsii</i>)	This species cannot tolerate prolonged periods of inundation. The Biodiversity maps online show Petalwort to be present at Castlemaine Harbour. There is a coincidence of flood hazard areas with the known species locations.
000365	Killarney National Park, Macgillicuddy'S Reeks And Caragh River Catchment	Taxus baccata woods of the British Isles.	Species are located in areas of fluvial flooding.
		Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	Taxus baccata and Marsh Fritillary larvae are recorded near Muckross Lake in areas identified as flood hazard. Marsh fritillary also occurs at Waterville however flooding
		Marsh fritillary (<i>Euphydryas</i>	

Site Code	Site Name	Reason for Extreme Classification	Rational for FRI
		aurinia)	only occurs in small areas therefore impact is not significant here.
			Locations of Lesser horseshoe bat roosting and breeding sites need to be confirmed with NPWS before a determination of flood risk can be made.
002158	Kenmare River	Narrow-mouthed whorl snail (<i>Vertigo angustior</i>)	Narrow-mouthed whorl snail has been recorded in areas subject to both fluvial and tidal flooding within the Kenmare River.
		Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	Locations of Lesser horseshoe bat roosting and breeding sites need to be confirmed with NPWS before a determination of flood risk can be made.
002170	Blackwater River (Cork/Waterford)	<i>Taxus baccata</i> woods of the British Isles	The principle area within the Blackwater River where this species occurs is at Lismore in County Waterford. The area is subject to fluvial flooding.

Figure 3.3 – Probable Areas for Further Environmental Assessment

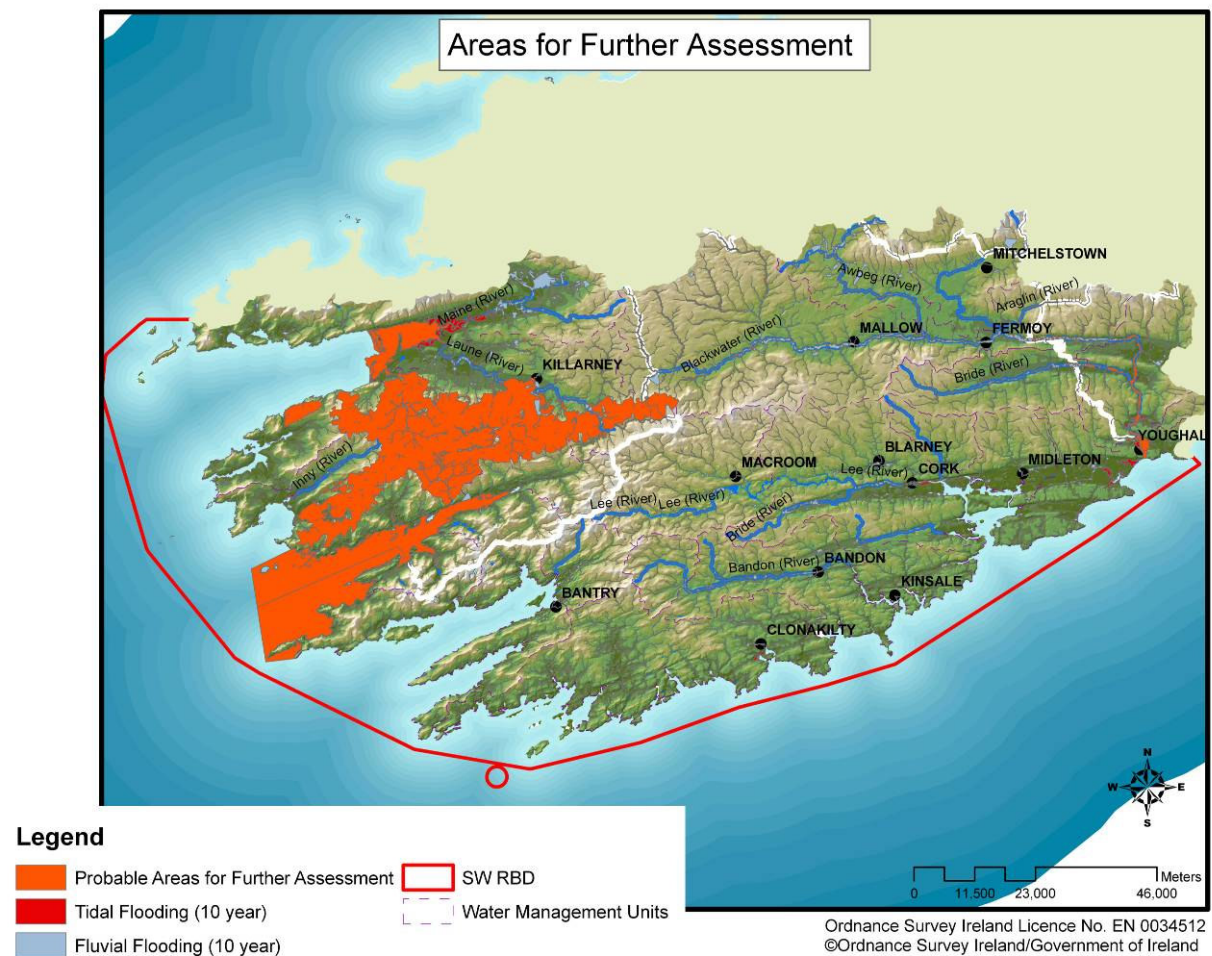


Plate 1 - Petalwort (*Petalophyllum ralfsii*) at Castlemaine Harbour

(Source: www.maps.biodiversityireland.ie)

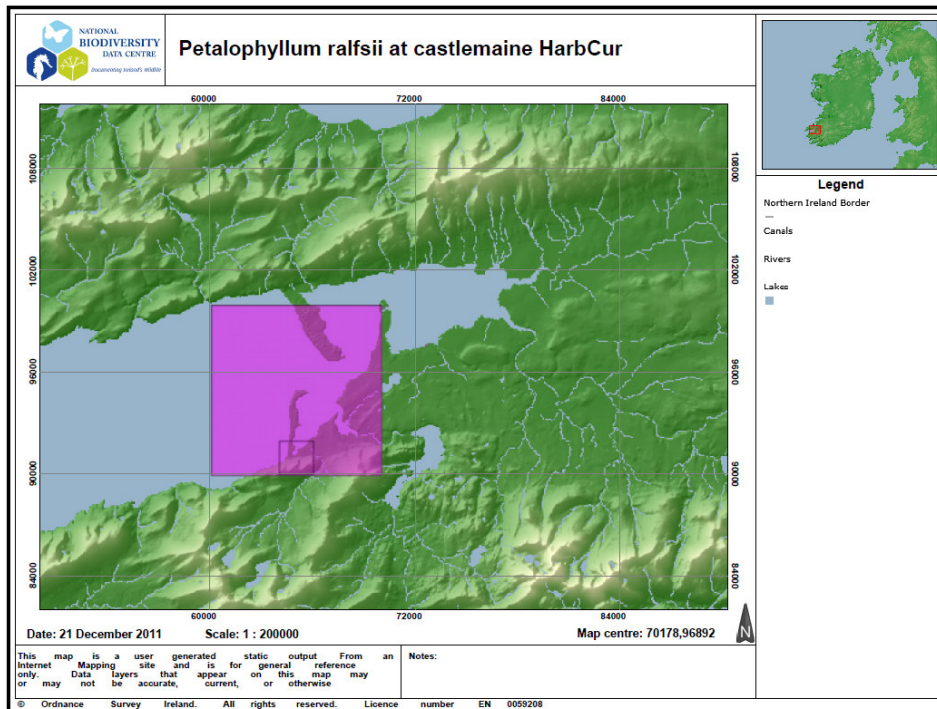


Plate 2 - *Taxus baccata* woods of the British Isles and Marsh fritillary (*Euphydryas aurinia*) at Muckross

(Source: www.maps.biodiversityireland.ie)

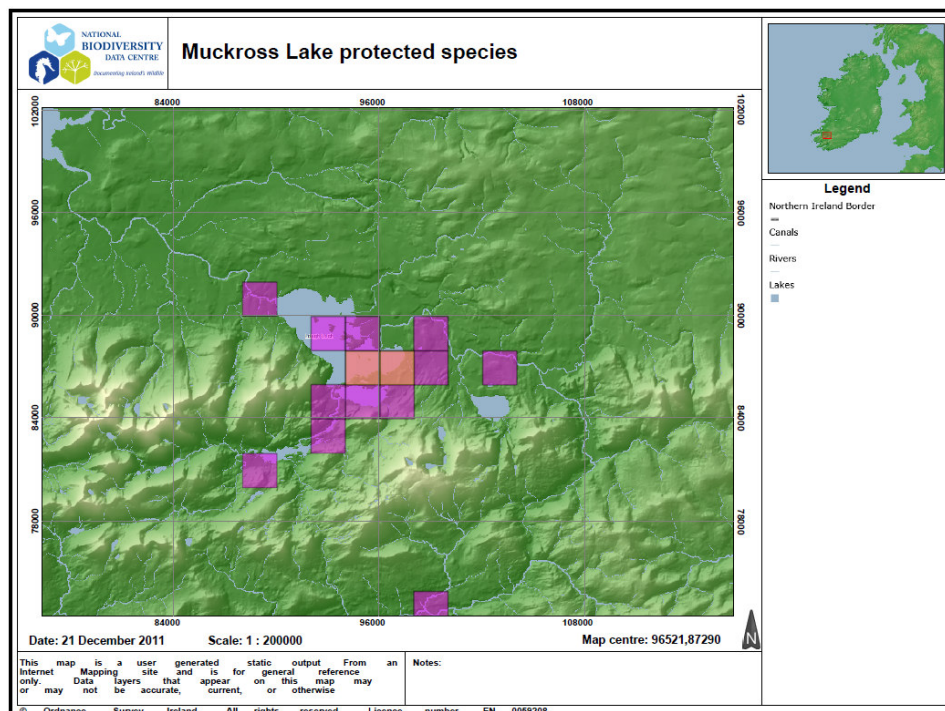


Plate 3 - Narrow-mouthed whorl snail (*Vertigo angustior*) at Kenmare River
(Source: www.maps.biodiversityireland.ie)

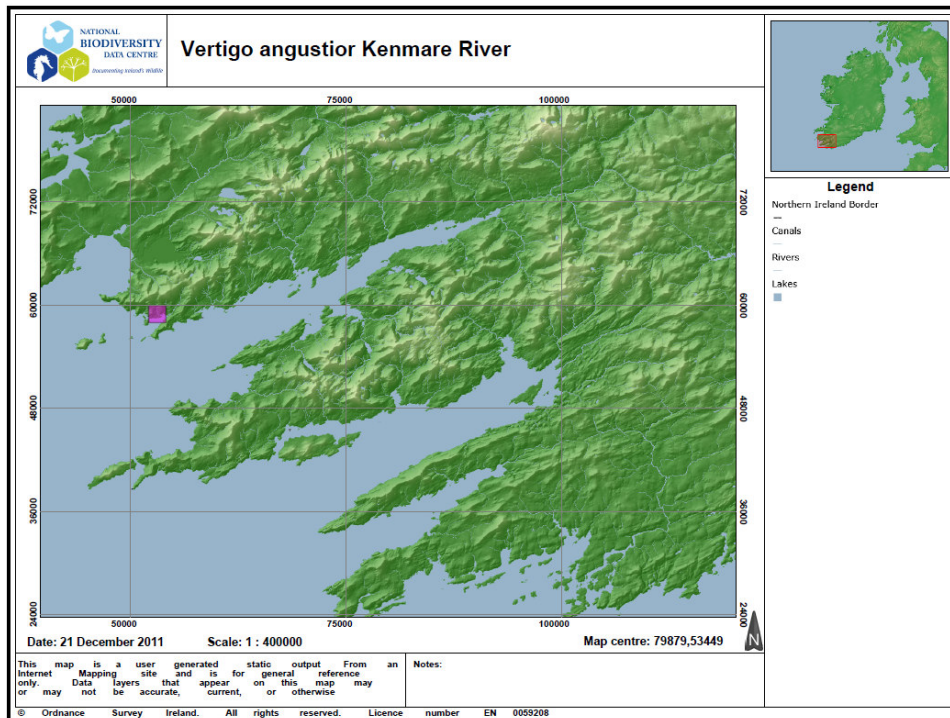
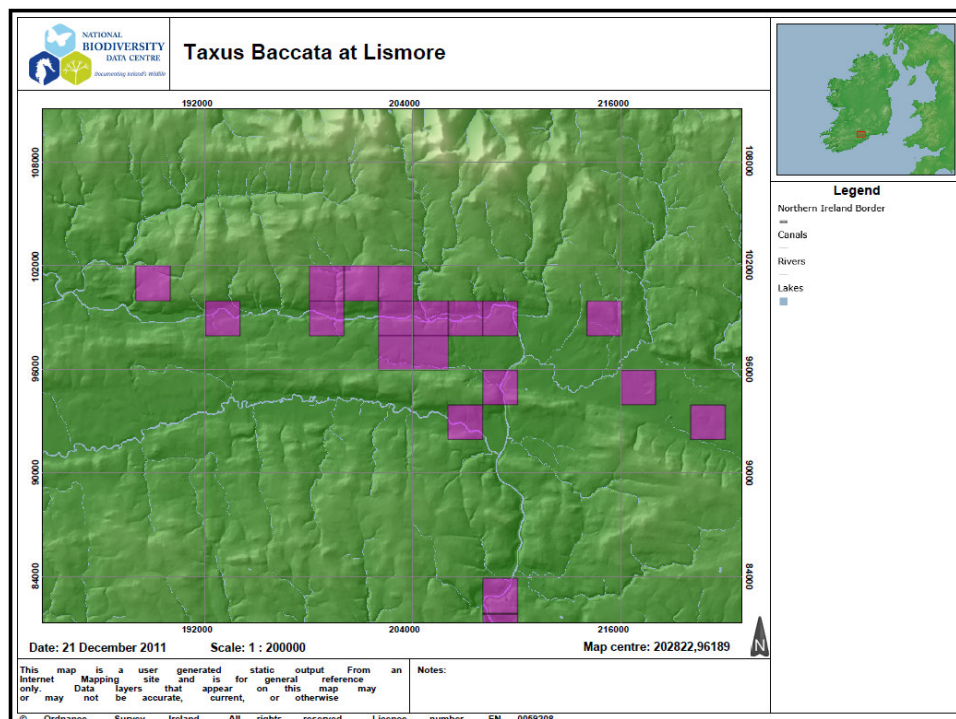


Plate 4 - *Taxus baccata* woods of the British Isles at Lismore
(Source : www.maps.biodiversityireland.ie)



Possible Areas for Further Environmental Assessment (AFEAs) have been identified as follows:

Note that consultation is underway with the National Parks and Wildlife Services (NPWS) to identify the locations of Lesser horseshoe bat roosting and breeding sites in order that a more accurate determination of flood risk can be made. The SACs identified hereunder may therefore change following NPWS input.

Table 3.4 – Possible Areas for Further Environmental Assessment

Site Code	Site Name	Reason for Extreme Classification	Rational for FRI
000090	Glengarriff Harbour And Woodland	Lesser horseshoe bat (Rhinolophus hipposideros)	Oak Woodland forms foraging and roosting habitat at this site. Need to determine if cave habitat is used where access/egress may be hindered by flooding. If No reduce vulnerability classification.
000335	Ballinskelligs Bay And Inny Estuary	Lesser horseshoe bat (Rhinolophus hipposideros)	The flooding extent is confined primarily to the tidal reaches of the Inny Estuary. Dune type habitat dominates which is unlikely to support lesser horseshoe bat roosting. Propose reducing vulnerability classification. Need confirmation from NPWS.
000353	Old Domestic Building, Dromore Wood	Lesser horseshoe bat (Rhinolophus hipposideros)	Area is subject to fluvial flooding. Habitat is dominated by conifer woodland. The 'Old Domestic Building' is quite large and is unlikely to be fully inundated by fluvial flooding. In addition access to roosting is likely to be in the upper floors of the building. Propose reducing vulnerability classification. Need confirmation from NPWS.
000364	Kilgarvan Ice House	Lesser horseshoe bat (Rhinolophus hipposideros)	Area is subject to fluvial flooding. Habitat is dominated by spruce and bog woodland. Woodland roosting sites are unlikely to be inundated by fluvial flooding. Need to determine if cave habitat is used where access/egress may be hindered by flooding. If No reduce vulnerability classification.
001342	Cloonee And Inchiquin Loughs, Uragh Wood	Lesser horseshoe bat (Rhinolophus hipposideros)	Fluvial flooding occurs in a minor section of the SAC. Propose reducing vulnerability classification. Need confirmation from NPWS regarding absence of bat roosts in flooded areas.
002173	Blackwater River (Kerry)	Lesser horseshoe bat (Rhinolophus hipposideros)	Need to confirm Lesser horseshoe bat with NPWS before assessment of actual vulnerability can be made.
002315	Glanlough Woods	Lesser horseshoe bat (Rhinolophus hipposideros)	Need to confirm Lesser horseshoe bat with NPWS before assessment of actual vulnerability can be made.

4. Recommendations

4.1 General

The PFRA identified areas where there may be a significant risk associated with flooding. Due to the preliminary nature of the PFRA, these areas were defined as Probable or Possible AFA's and subject to validation (Flood Risk Review) during site visits. Flood Risk Reviews have been carried out for each of the areas listed and the revised designations are provided below:

Table 4.1 – Probable Areas for Further Assessment

HA	Name	Unique ID	Fluvial	Coastal	County	Easting	Northing
18	Aglish	180247	Yes	No	Waterford	212250	91500
18	Ballyduff	180248	Yes	No	Waterford	196500	99500
18	Fermoy	180252	Yes	No	Cork	182750	99500
18	Freemount	180253	Yes	No	Cork	139500	114250
18	Kanturk	180254	Yes	No	Cork	138250	102750
18	Mallow	180262	Yes	No	Cork	155250	98500
18	Rathcormack	180265	Yes	No	Cork	181750	91000
18	Tallow	180266	Yes	No	Waterford	199750	93750
18	Youghal	180267	Yes	Yes	Cork	210250	78750
19	Killeagh	190274	Yes	No	Cork	200750	75750
19	Castlemartyr	190277	Yes	No	Cork	196250	73250
19	Ballingeary*	195499	Yes	No	Cork	115090	67135
20	Clonakilty	200294	Yes	Yes	Cork	138000	41250
20	Dunmanway	200297	Yes	No	Cork	122250	52750
20	Schull	200303	Yes	No	Cork	92500	31500
21	Bantry	210307	Yes	Yes	Cork	99750	48500
21	Castletown Bearhaven	210308	Yes	Yes	Cork	68000	46000
21	Durrus	210309	Yes	No	Cork	95000	42000
21	Kenmare	210312	Yes	Yes	Kerry	90750	70500
22	Castleisland	220323	Yes	No	Kerry	97750	110000
22	Dingle	220327	Yes	Yes	Kerry	44500	101000
22	Killarney	220337	Yes	No	Kerry	97000	90500
22	Milltown	220339	Yes	No	Kerry	82500	101000

Table 4.2 – Probable Areas for Further Environmental Assessment

Probable Areas for further Environmental Assessment (AFEA's)
Castlemaine Harbour
Killarney National Park, Macgillicuddy's Reeks And Caragh River Catchment
Kenmare River
Blackwater River (Cork/Waterford)

Table 4.3 – Possible Areas for Further Assessment

HA	Name	Unique ID	Fluvial	Coastal	County	Easting	Northing
18	Cappoquin	180249	Yes	No	Waterford	210000	99500
18	Castlelyons	180250	Yes	No	Cork	184000	92750
18	Clashmore	180251	Yes	No	Waterford	212500	84250
18	Killavullen	180256	Yes	No	Cork	164750	99750
18	Lismore	180260	Yes	No	Waterford	204750	99000
18	Mitchelstown	180263	Yes	No	Cork	182250	112500
18	Twopothouse	180264	Yes	No	Cork	153750	103750
18	Buttevant	182269	Yes	No	Cork	154256	109254
18	Rathmore	182363	Yes	No	Kerry	116493	93258
19	Coachford	190273	Yes	No	Cork	145750	73250
19	Ladysbridge	190275	Yes	No	Cork	197500	72250
19	Mogeely	190276	Yes	No	Cork	196500	75750
19	Carrigtwohill	192399	Yes	Yes	Cork	182035	73393
19	Dromanallig	192424	Yes	No	Cork	114315	67100
20	Dromore School	200295	Yes	No	Cork	106000	45750
20	Dunderrow	200296	Yes	No	Cork	159250	52750
20	Inishannon	200298	Yes	Yes	Cork	155000	57000
20	Ross Carbery	200301	Yes	Yes	Cork	128750	36750
20	Ardcahan	202474	Yes	Yes	Cork	125389	56541
21	Black Ball Head	210304	No	Yes	Cork	58500	40000
21	Kealkill	210311	Yes	No	Cork	104500	56250
21	Kilcrohane	210313	Yes	No	Cork	82250	37750
21	Templenoe	210315	Yes	Yes	Kerry	82750	69500
21	Sneem	212577	Yes	No	Kerry	69075	66940
22	Innisfallen Abbey	220316	Yes	No	Kerry	93250	89250
22	Boolteens	220320	Yes	No	Kerry	79000	104000
22	Castlemaine	220324	Yes	Yes	Kerry	83500	103000
22	Coolroe Lower	220325	Yes	No	Kerry	65500	89000
22	Cordal	220326	Yes	No	Kerry	104500	109000
22	Faha West	220329	Yes	Yes	Kerry	87750	96500
22	Farranfore	220330	Yes	No	Kerry	94000	104500
22	Fieries	220331	Yes	No	Kerry	91500	103250
22	Glenbeigh	220333	Yes	Yes	Kerry	66250	91000
22	Gortnacarriga	220335	Yes	No	Kerry	95750	95500
22	Kilfarnoge	220336	No	Yes	Kerry	38000	98000
22	Killorglin	220338	Yes	Yes	Kerry	77500	96000
22	Portmagee	220340	Yes	Yes	Kerry	36500	73000
22	Anascaul	222579	Yes	No	Kerry	59397	101791
22	Ballymalis	222583	Yes	No	Kerry	84222	94958
22	Cromane	222594	Yes	No	Kerry	69976	96440
22	Curreal	222595	Yes	No	Kerry	106553	85933
22	Derreenacullig	222596	Yes	No	Kerry	107739	80874
22	Rossbehy	222623	Yes	Yes	Kerry	64828	92434

HA	Name	Unique ID	Fluvial	Coastal	County	Easting	Northing
22	Glenflesk	225502	Yes	No	Kerry	106621	85316
22	Fossa	225503	Yes	No	Kerry	91919	92102

Table 4.4 – Possible Areas for Further Environmental Assessment

Possible Areas for further Environmental Assessment (AFEAs)
Glengarriff Harbour And Woodland
Ballinskelligs Bay And Inny Estuary
Old Domestic Building, Dromore Wood
Kilgarvan Ice House
Cloonee And Inchiquin Loughs, Uragh Wood
Blackwater River (Kerry)
Glanlough Woods

Appendices

Appendix A. Site Inspection Reports	20
-------------------------------------	----

Appendix A. Site Inspection Reports

Map Legend for Site Inspection Reports

Blue Line – 10% AEP Flood Extent



Green Dashed Line – 1% AEP Flood Extent



Red Dashed Line – 0.1% AEP Flood Extent



Black Dashed Line – Revised Flood Extent



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Aglish	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180247	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 09/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Not on Predictive analysis, Local Authority not aware of flooding <u>APP COMMENT – R1</u> Possible errors in predictive flood extent - Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Small Village, River flows through it. Not aware of flooding issues in the past. Ballynap Bridge collapsed. School, Church and Graveyard. Waterford Co.Co to follow up. <u>LA COMMENT – R2</u> Have checked with 2 area engineers who are not aware of a problem.		
Floodmaps.ie Information: Three flood events are recorded on the Floodmaps.ie website for Aglish: <ol style="list-style-type: none"> 1. Flood Event: Aglish recurring 2. Flood Event: Ballynaparka Bridge Aglish recurring 3. Flood Event: Ballynaparka Bleach recurring <p>Two of these flood event records (Flood Event 1 & 2) are within the risk review area on the overview map for Aglish.</p> <p>Minutes of meeting with Waterford County Council (WCC) Dungarvan Area Engineer and District Overseers in 2006 to identify location vulnerable to regular or historic flooding in the Dungarvan district, also identified the following areas subject to flooding within the overview map for Clashmore.</p> <ul style="list-style-type: none"> • Ballynaparka Bridge at Aglish – recurring flooding. Properties affected. (Flood ID 3807). 		

- Aglish village – village can flood under severe rainfall events. (Flood ID 3808).

Stakeholder Comments:

Waterford County Council personnel interviewed were aware of flooding in the area of Aglish. The following is noted:

Ballynaparka Bridge:

The Local Authority confirmed that fluvial flooding occurs quite frequently on the Ballynaparka River at the location of the Ballynaparka Bridge in Aglish.

Properties adjacent to this bridge are at high risk and are vulnerable to regular flooding. In a 2010 flood event the bridge was damaged and had to be repaired. The properties adjacent to this bridge were also flooded in the 2010 flood event.

Aglish village:

The Local Authority also confirmed that fluvial flooding occurs on the local road between the Ballynaparka Bridge and the village of the Aglish. In 2010 the road in front of the school, church and some houses was flooded. It was also confirmed the area around the bridge within the village may flood if the bridge is not cleared regularly.

North of Aglish:

The Local Authority also confirmed that fluvial flooding occurs north of Aglish, which may affect the gardens of the two properties adjacent to a Ballynaparka river tributary.

During discussions with a local resident living adjacent to the bridge within the village of Aglish, she stated that fluvial flooding occurs to the back of her garden and side of the property at times of heavy rainfall and high river levels. She also recalls that the local road between the village and the Ballynaparka bridge was previously flooded.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the AEP outlines within Aglish are not representative of the local topography and historical flood events that occurred in the area.

The 10% AEP outline on the east side of Aglish village appears to be overestimating flood risk in this area. This removes approximately 2 residential and commercial properties from the Flood Risk Index (FRI).

It is noted however that the AEP outlines adjacent the Ballynaparka Bridge are under estimating flood risk in the area. This amendment includes approximately 3 residential and commercial properties to the FRI.

The AEP outline between the Ballynaparka Bridge and the village of the Aglish also requires amending to reflect historical flood events that occurred in the area.

Based on the site visit the PFRA outlines for Aglish have been amended as shown in the map attached to this Site Inspection Report.



Bridge in Aglish village



Ballynaparka Bridge – Ballynaparka River

Receptor Comments:

Adjusting the 10% AEP flood outline east of the village, based on the site visit removes a total of 2 residential and commercial properties from the FRI. The total reduction of residential and commercial receptors in this area reduces the score by a maximum of 20.

Adjusting the 10% AEP flood outline adjacent the Ballynaparka Bridge, based on the site visit includes a total of 3 residential and commercial properties to the FRI. The total addition of residential and commercial receptors in this area increases the score by a maximum of 30.

The overall amendments of the Flood Risk Outlines lead to an increase of 10

points to the Flood Risk Index total. This increases the FRI score from 355 to 365.

Evidence of Flooding:

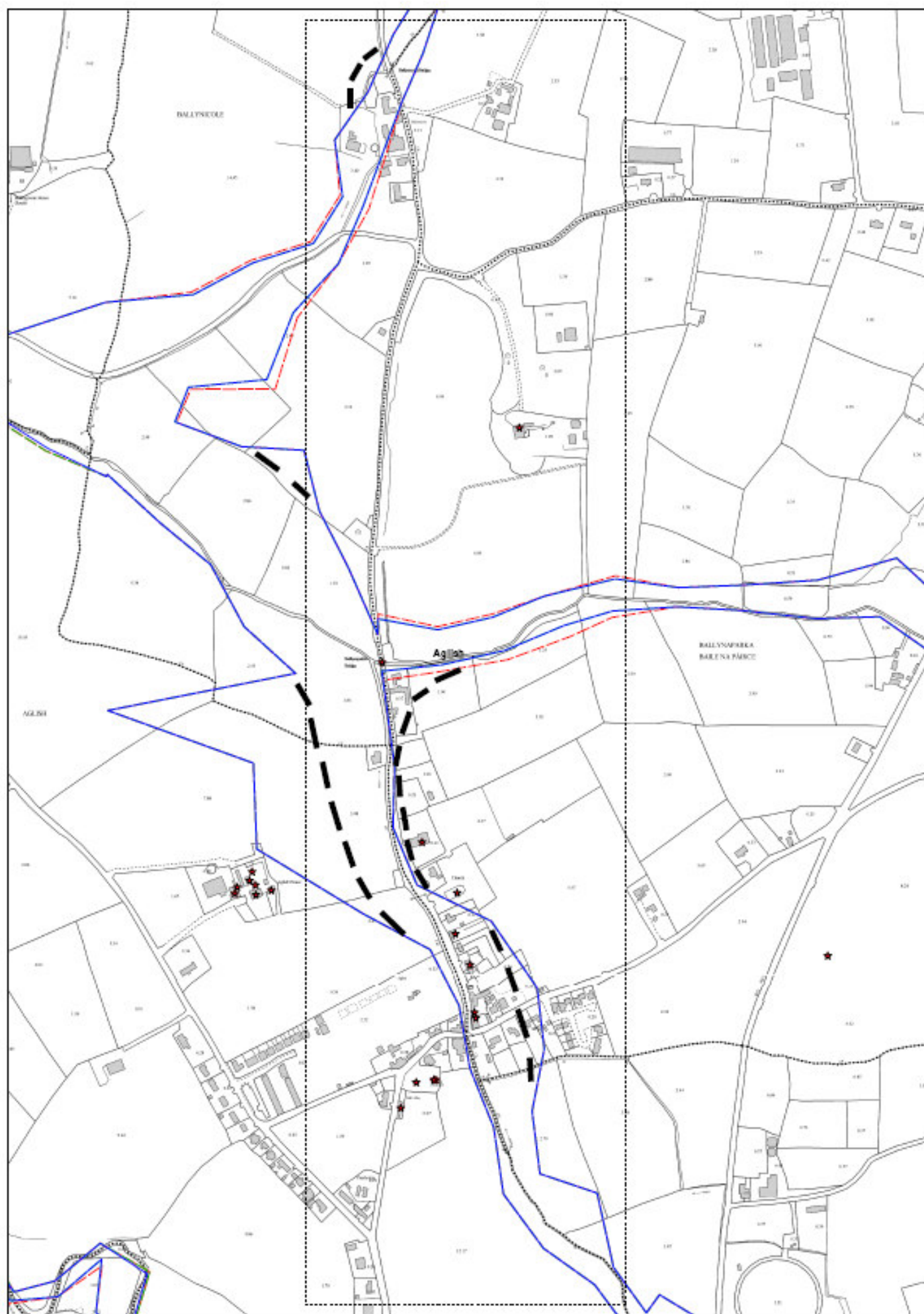
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Aglish.

Summary:

The site is as an AFA as the FRI score for Aglish is above the 250 score threshold.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Anascaul	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 222579	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 09/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> LA asked for it to be included. <u>VAL COMMENT R1:</u> LA requested inclusion due to some flooding at eastern end of village <u>APP COMMENT R1:</u> Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> Some flooding occurs in western part of the village		
Floodmaps.ie Information: The website does not contain any record of historical flooding at this location.		
Stakeholder Comments: Two local people were consulted about flooding during the survey and both stated that they had never witnessed flooding as a result of high river levels. One woman advised that the “South Pole” pub (west end of village) floods regularly and that this was due to water running down the road in heavy rain events. A blocked gully (full of silt) was noted outside the pub and it was also noted that the pub is at a lower level than the road and nearby buildings in addition to having a basement. She was also of the opinion that there was a similar problem near the school and that new development in recent years had exacerbated the problem. The Local Authority had no specific issues in relation to this site.		

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis except near the convergence point of the three water courses at the village (north of bridge – see photo below).



Convergence of three water courses upstream of N86 bridge in Anascaul Village

In some cases where there is a significant meander in the stream, it extends beyond the flood outline and this is most likely an error caused by the distance between model nodes.

However, from the discussions with locals and the channel cross sections and land levels observed on site, it appears that the PFRA outlines are over estimating the flood risk index. For example, in the photo below, the channel is ~2m below the road level (foreground) yet the new houses (background, higher level) were indicated as a flood risk.



New houses outside predicted flood lines (taken near Annagap Bridge)

Through comparison of the PFRA flood lines with the topography observed on site, the outlines were modified to show a more likely flood extent as indicated on the attached map.

Receptor Comments:

No specific receptor information was available at the time of the survey.

However, from the revised outlines, it is estimated that the only receptors may be a residential property and a pub.

Evidence of Flooding:

No evidence of flooding observed and no flood defences are present.

However, the natural channel has very high sides in places and this is likely to prevent overtopping even at high flow rates.

Summary:

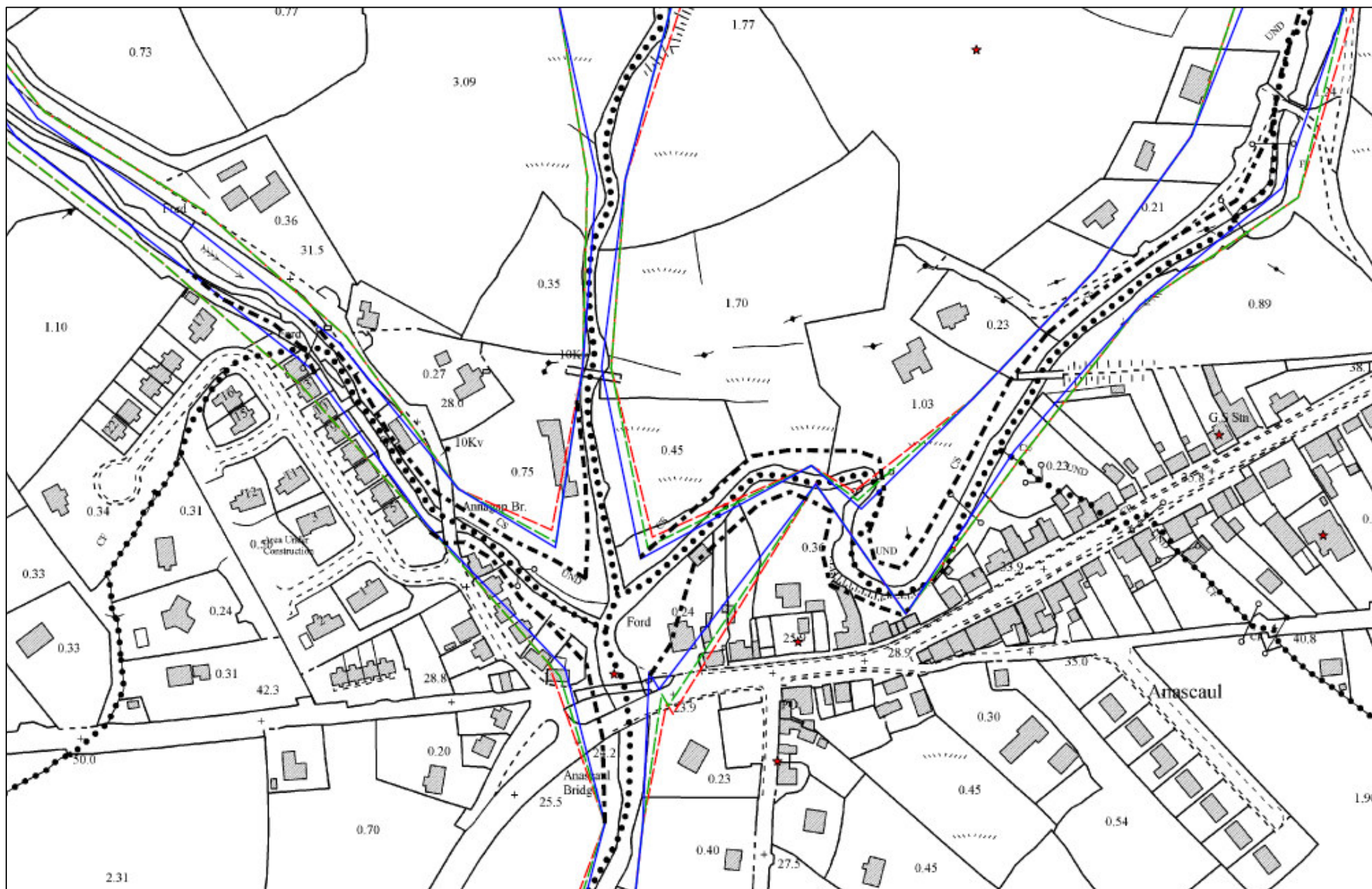
Since the flood risk index is likely to be very low and the fact that the source of previous flooding may be a pluvial issue rather than fluvial (as asserted by locals), it is deemed that Anascaul does not need further assessment.

However, the pluvial flooding problem is something which needs to be

highlighted to the local authority.

Site Visit Findings:

Not AFA.



Revised Flood Boundary





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ardcahan	Hydrometric Area: 20	County: Cork
Unique OPW ID: 202474	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 16/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Occasional residential flooding <u>APP COMMENT – R1</u> Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contains only photographs of flooding and are dated 23 February 1991. Not all photographs relate to Ardcahan. However, 8 photographs are labelled as Ardcahan Bridge.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: There is no FRI score or boundary (i.e. PFRA boundary, LA Boundary or other) available for Ardcahan. Therefore, the site inspection focused on the general Ardcahan area as shown in the attached map. The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar and appear reasonable. There are no obvious anomalies such as wedges. However, there are some minor alignment issues between the flood outlines and the river centreline.		

Due to the rural nature of the area it was not possible to gain access to all sections of the river to verify flood outlines.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



View from Ardcahan Bridge



View from Ardcahan Bridge

Receptor Comments:

Based on the PFRA receptor datasets and flood outlines provided there are no receptors within the flood outlines. Based on the site visit and the modified flood outlines no receptors were identified as being within the flood outline.

Evidence of Flooding:

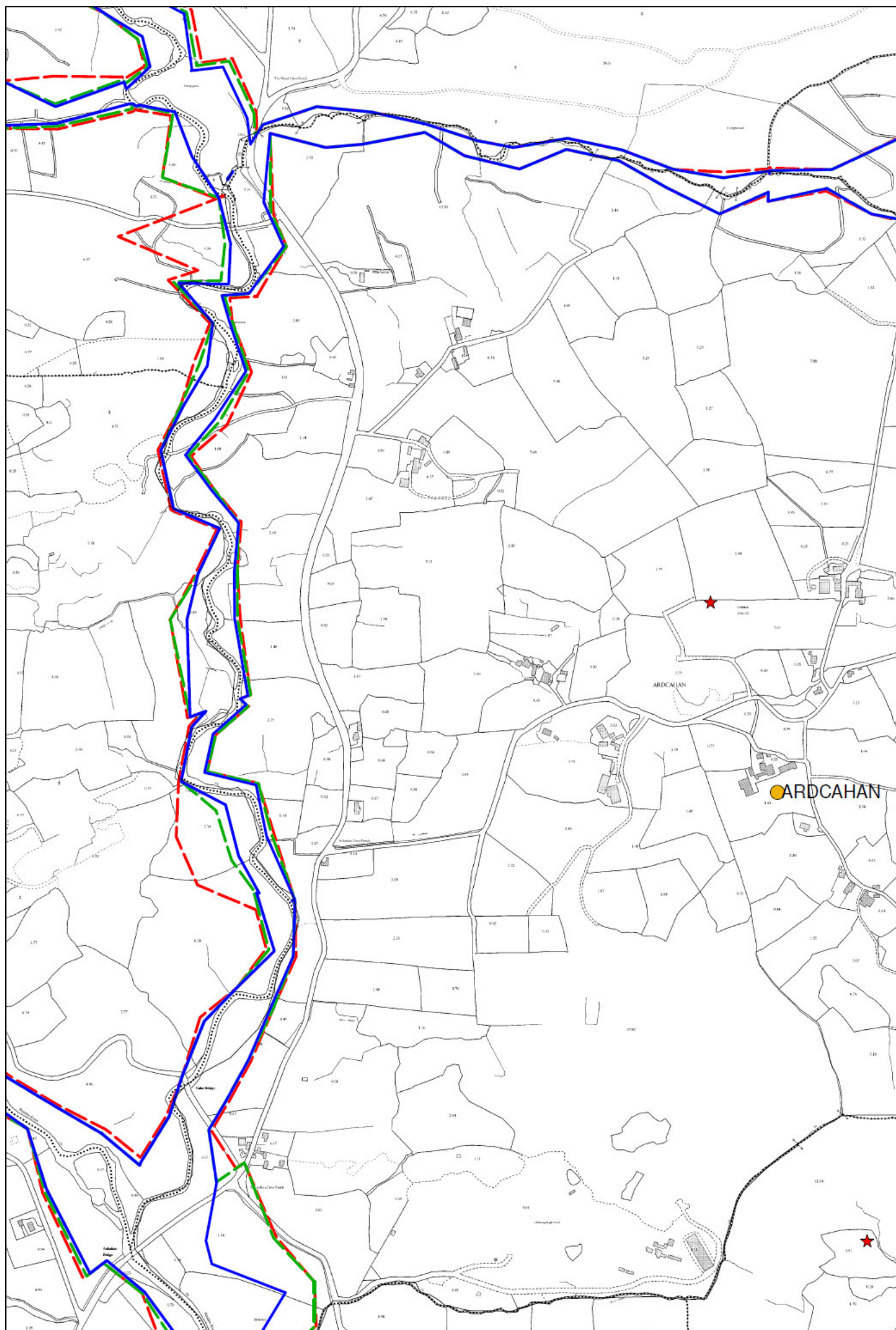
During the site visit there were no visible signs of flooding within the area.

Summary:

The fluvial flood risk outlines have been modified. From the PFRA data provided and the site visit there are no receptors within the flood outlines. Therefore, the site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ballingeary	Hydrometric Area: 19	County: Cork
Unique OPW ID: 195499	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 14/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Not in original Lee CFRAMS. Upgrade now to APSR? <u>APP COMMENT – R1</u> Mapping needs review under Lee CFRAM, and action to be taken by OPW as appropriate outside of National CFRAM Process - SW CFRAM is not to re-do communities covered by Lee CFRAM		
LA Feedback Comments: <u>LA COMMENT – R2</u> Not identified in Lee CFRAMS as at risk of flooding - being reassessed by OPW		
Floodmaps.ie Information: The website contained three documents in relation to flooding a Ballingeary. Two of the documents were OPW Flood Event Reports for events in November 2009 and January 2011. The third documents was a presentation on the flooding in Ballingeary during November 2009. All documents report extensive flooding in Ballingeary.		
Stakeholder Comments: The OPW provided numerous photographs of extensive flooding in 2004. Also provided maps highlighting properties which have previously flooded. The Local Authority had no specific issues in relation to this site.		

Predictive PFRA Flood Outline:

There is no PFRA boundary or FRI score available for this area. A separate boundary area was provided and the site inspection focused on the flood risk outlines within this boundary.

The Predicted 10% AEP fluvial outline extends beyond the 1% and 0.1% AEP at numerous points. Based on the site visit and the review of historical flood records the 10% AEP fluvial outline appears to more accurately reflect the extent of the flooding. The 1% and 0.1% AEP outlines appear to underestimate the extent of flooding.

However, the 10% AEP fluvial outline has been amended to take account of the topography and some other anomalies.



Ballingeary – recent works along the river bank upstream of the town.



Ballingeary – view of river and town downstream of bridge.

Receptor Comments:

As mentioned above, there is no FRI score available for Ballingeary from the PFRA. However, based on the site visit and review of historical flood data over 25Nr. residential and commercial properties were identified within the flood extent outlines. Furthermore, a school to the north of the town was also identified as being within the 10% AEP fluvial flood outline. Therefore, the site is an AFA with an FRI score in excess of 500.

Evidence of Flooding:

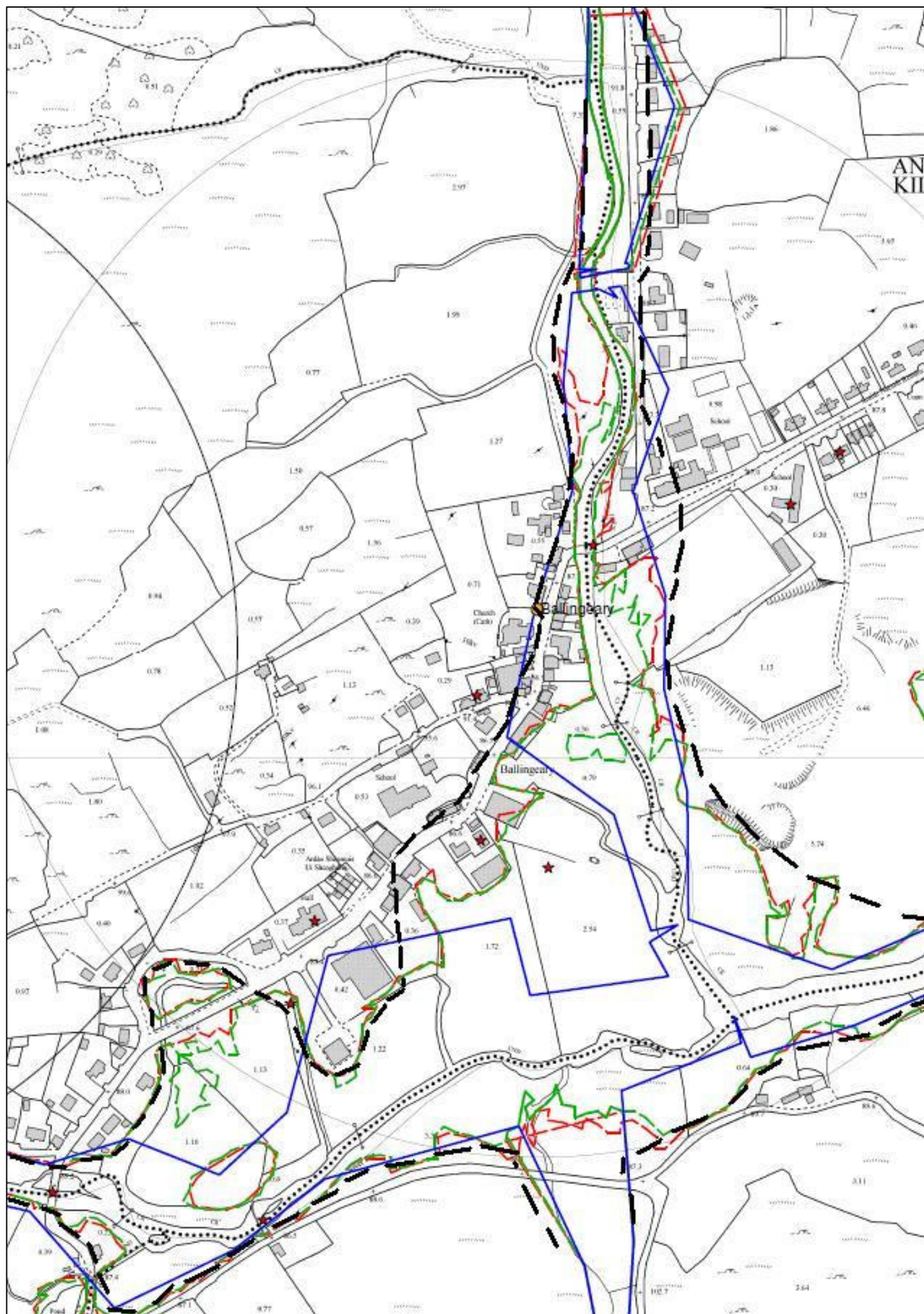
During the site visit there were no visible signs of flooding. However, a number of locals all recalled flooding in January 2011 and in November 2009.

Summary:

The 10% AEP predicted fluvial flood extent outline appear to reflect the records and accounts of the extent of the flooding in November 2009. Over 25Nr. residential and commercial properties, along with a school have been identified as at risk. The site is an AFA.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ballyduff	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180248	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 13/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Downstream of Fermoy, some property may be at risk, Low Historic Risk and Hazard. High FRI Score <u>APP COMMENT – R1</u> Approved - APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Next Town D/S of Fermoy, could be a risk, need to ask area engineer. Risk driven by residential and lesser commercial, plus pollution source. <u>LA COMMENT – R2</u> Minor work intended, leave it. On R666 west of Ballyduff at 4 locations property is at risk. Approx 300m retaining wall reqd for Blackwater. Strategic route of huge importance, no alternative route or access for emergency services.		
Floodmaps.ie Information: Seven flood events are recorded on the Floodmaps.ie website for Ballyduff: <ol style="list-style-type: none"> 1. Flood Event: Blackwater Ballyduff Oct 2004 2. Flood Event: Blackwater Garra Oct 2004 3. Flood Event: Blackwater Ballyduff November 2000 4. Flood Event: Blackwater Ballyduff August 1986 5. Flood Event: Blackwater Ballyduff Bridge recurring 6. Flood Event: Blackwater Ballyduff recurring 7. Flood Event: Blackwater Garra recurring Five of these flood event records (Flood Event 1, 3, 4, 5 & 6) are within the risk review area on the overview map for Ballyduff. Minutes of meeting with Waterford County Council (WCC) Lismore Area Engineer and District Overseers in 2006 to identify location vulnerable to regular or historic flooding in the Lismore district, also identified the following areas		

subject to flooding within the overview map for Ballyduff.

- River Blackwater at Ballyduff Bridge. The road to Ballnerroon is regularly impassable due to recurring flooding from the Blackwater. (Flood ID 3828).
- River Blackwater at Ballyduff. The road is regularly impassable due to recurring flooding from the Blackwater. One house at risk. It is understood the church has flooded in the past. (Flood ID 3829).

Stakeholder Comments:

Waterford County Council personnel indicated that they are aware of flooding in the area of the overview map for Ballyduff. The following is noted:

Ballyduff Village & Ballyduff Bridge:

The Local Authority confirmed that fluvial flooding occurs on the Blackwater River at the location of the Ballyduff Bridge and Ballyduff. The local road and properties adjacent to the Ballyduff Bridge are vulnerable to flooding. The Area Engineer recalls that the area within the Ballyduff was flooded during a previous major flood event a number of years ago. He confirmed that a number of properties within Ballyduff were affected during the flood event.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the AEP outlines within Ballyduff are not representative of the local topography and historical flood events that occurred in the area.

Some sections of the outlines within Ballyduff appear to be overestimating flood risk in this area. The amendment to the outlines removes approximately 14 residential and commercial properties from the Flood Risk Index (FRI).

Based on the site visit the PFRA outlines for Ballyduff have been amended as shown in the map attached to this Site Inspection Report.



Ballyduff Bridge – Blackwater River



Ballyduff Bridge – Blackwater River

Receptor Comments:

Adjusting the flood outlines within Ballyduff, based on the site visit removes a total of 14 residential and commercial properties from the FRI. The total reduction of residential and commercial receptors in this area reduces the score by a maximum of 140.

The overall amendments of the Flood Risk Outlines lead to a decrease of 140 points from the Flood Risk Index total. This decreases the FRI score from 493.3 to 353.3.

Evidence of Flooding:

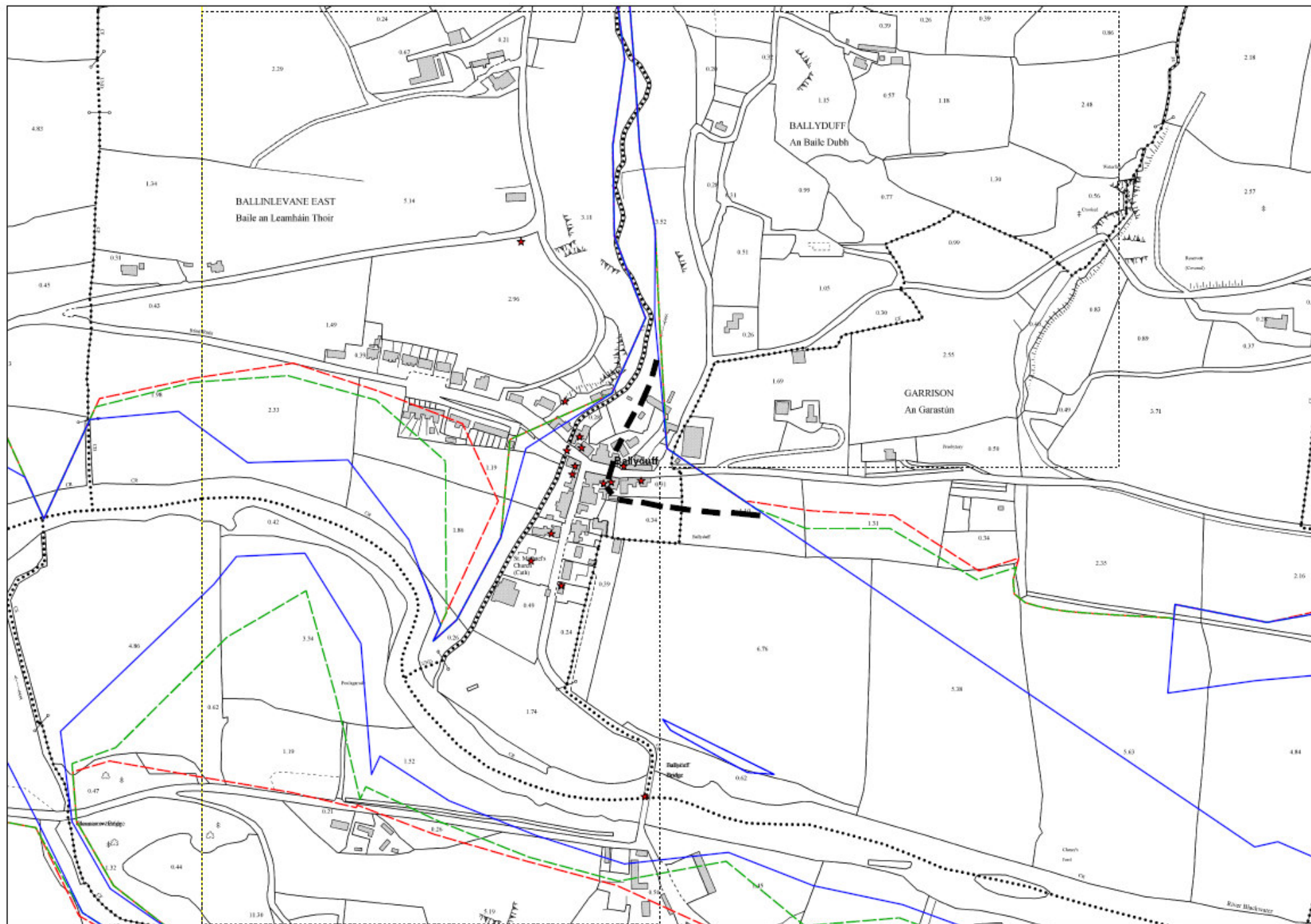
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Ballyduff.

Summary:

The site is an AFA as the FRI score for Ballyduff is above the 250 score threshold.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ballymalis	Hydrometric Area: 22	County: Kerry.
Unique OPW ID: 222583	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Road and land flooding <u>APP COMMENT – R1</u> Not an APSR <u>VAL COMMENT – R2</u> None <u>APP COMMENT – R2</u> No additional information provided, but assume LA requested Risk Review – Some historic evidence of flooding - Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R1</u> On Killarney-Killorglin road (N72), lands and road at risk. Also River Gweestin flooding at Rockfield Bridge and Ballinillane.		
Floodmaps.ie Information: Minutes of meeting with Kerry County Council (WCC) Killorglin Area Engineer in 2006 to identified the following area subject to flooding within the overview map for Ballymalis. <ul style="list-style-type: none"> Ballymalis Cross on N72 between Killorglin and Killarney (Flood ID – 740/4721/4722). When the Gweestin River is in flood it backs up when there are high tide levels in the River Laune causing the N72 to flood. Land adjacent to the Gweestin is also flooded over a considerable distance. Flooding occurred in January 2002. In August 1986 a number of houses were flooded at Ballymalis Cross. The road was raised by in excess of a metre 5 or 6 years ago but it still floods. Road is impassable every 2/3 years. 		

Stakeholder Comments:

Kerry County Council personnel interviewed were aware of flooding in the area of the overview map for Ballymalis. The following is noted:

N72 Road/Ballymalis Cross:

The Local Authority Area Engineer confirmed that fluvial floods occur in the area of Ballymalis causing the N72 national secondary road to become impassable. He confirmed that the land adjacent to the Laune River and also the area adjacent to the Gweestin stream are prone to flooding, thus causing the N72 road to flood. He also noted that Ballymalis Cross is at risk of flooding and some properties adjacent to the cross may be affected.

Predictive PFRA Flood Outline:

From the site visit it would appear that the predicted outlines within Ballymalis are reasonably representative of the local topography however some minor amendments are required including an amendment to the outlines along the N72 national secondary road and at Ballymalis Cross.

Based on the site visit the PFRA outlines for Ballymalis have been amended as shown in the attached map.



Ballymalis Bridge



Ballymalis Bridge adjacent to Kerry Woollen Mills



Culleeny Bridge - Dorannagh Stream

Receptor Comments:

The amendment to the AEP outlines along the N72 national secondary road and at Ballymalis Cross includes a total of 3 residential or commercial properties to the Flood Risk Index (FRI). The total addition of residential and commercial receptors in this area would increase the score by a maximum of 30. It is noted however that no score has been allocated to Ballymalis within the OPW PFRA database, however from the site visit and from review of the risk review area on the overview map for Ballymalis a Flood Risk Index (FRI) score of 72.4 would be considered appropriate. This FRI score would include a maximum number of 13 residential or commercial properties lying within the different AEP (10%, 1% & 0.1 %) flood outlines.

Evidence of Flooding:

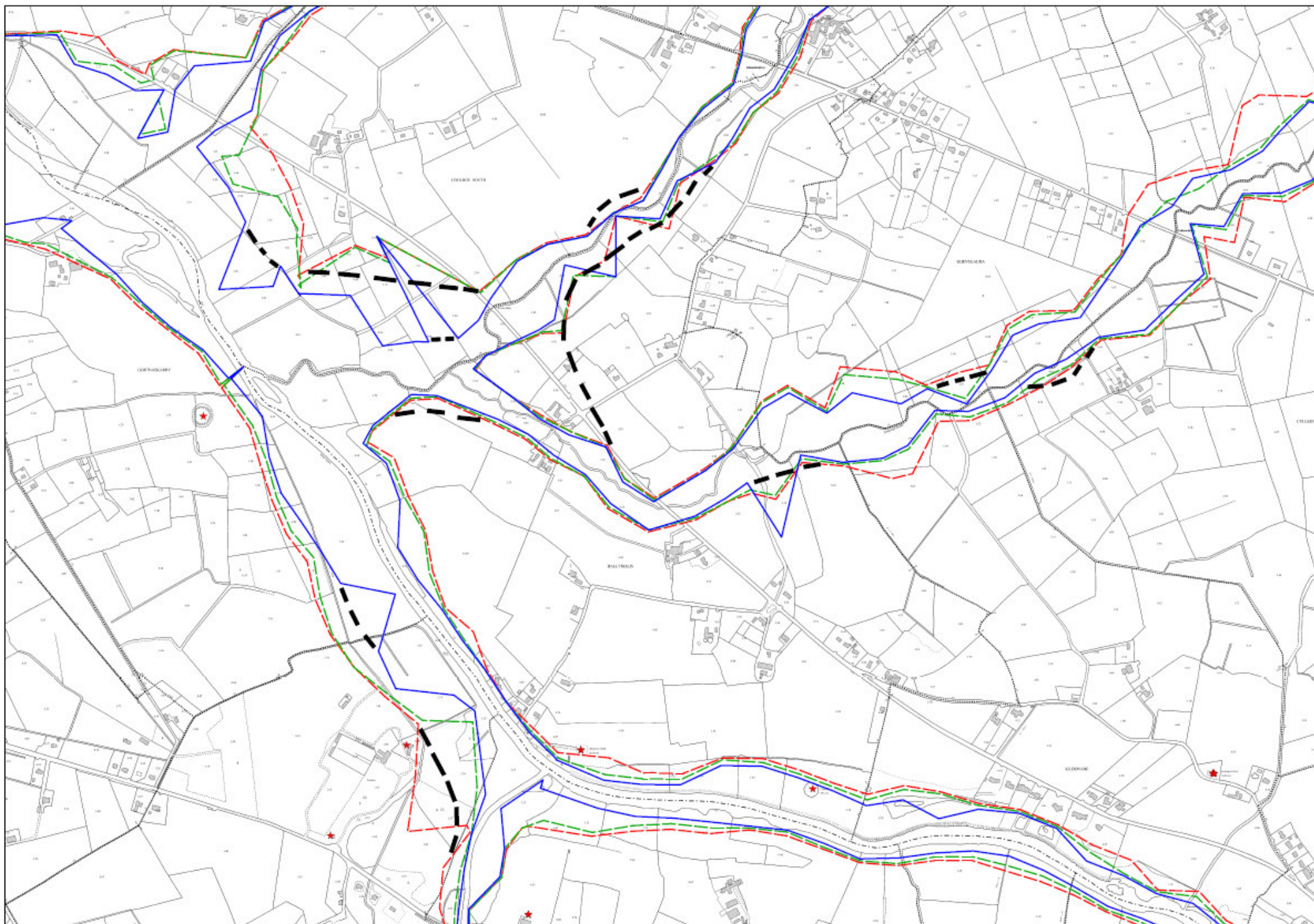
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Ballymalis.

Summary:

The Site is not an AFA as the predicted FRI score for Ballymalis falls below the 250 score threshold. It is noted however from discussions with the Local Authority that fluvial flooding does occur within the risk review area for Ballymalis, affecting the N72 national secondary road adjacent to the Laune River and the Gweestin stream.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Bantry	Hydrometric Area: 21	County: Cork
Unique OPW ID: 210307	Site Type: CAR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 14/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Tidal and Fluvial <u>APP COMMENT – R1</u> Approved APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Tidal with some fluvial. No treatment plants <u>LA COMMENT – R2</u> Flooding an issue. Major coastal flooding an issue. Also fluvial and pluvial flooding		
Floodmaps.ie Information: The website contained a number of documents including newspaper clipping, minutes of meetings and reports in relation to flooding in Bantry. The newspaper clippings were in relation to flooding in the Cork and Munster region. The minutes were in relation to a meeting between CCC and the ESBI regarding data collection as part of the OPW Flood Hazard Mapping project. The minutes contain details of two localised flooding events in Bantry and refer to reports on the Bantry Surface Water Scheme. The reports included are the Preliminary Report and Appendices of the Bantry Surface Water Scheme as mentioned above. This report highlights historical events of tidal and storm water flooding within the town.		

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar and appear reasonable. However, there is a negative wedge in the outlines in the centre of the town.

Following the site visit the fluvial flood risk outlines have been modified slightly. The negative wedge has been removed (i.e. increasing the number of receptors within the outlines) and the outlines to the south of New Street have been modified to take account of the steep topography.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the attached to this Site Inspection Report. No changes are recommended to the coastal flood outlines.



View from Library to the east of the Town



River upstream of town

Receptor Comments:

The modifications to the fluvial flood risk outlines have resulted in the inclusion and exclusion of a number of receptors. Overall, the number of residential / commercial properties at risk has been reduced by approximately 15. However, due to the initial FRI score of over 4000, this reduction has little significance in relation to the designation of Bantry. The site is an AFA.

Evidence of Flooding:

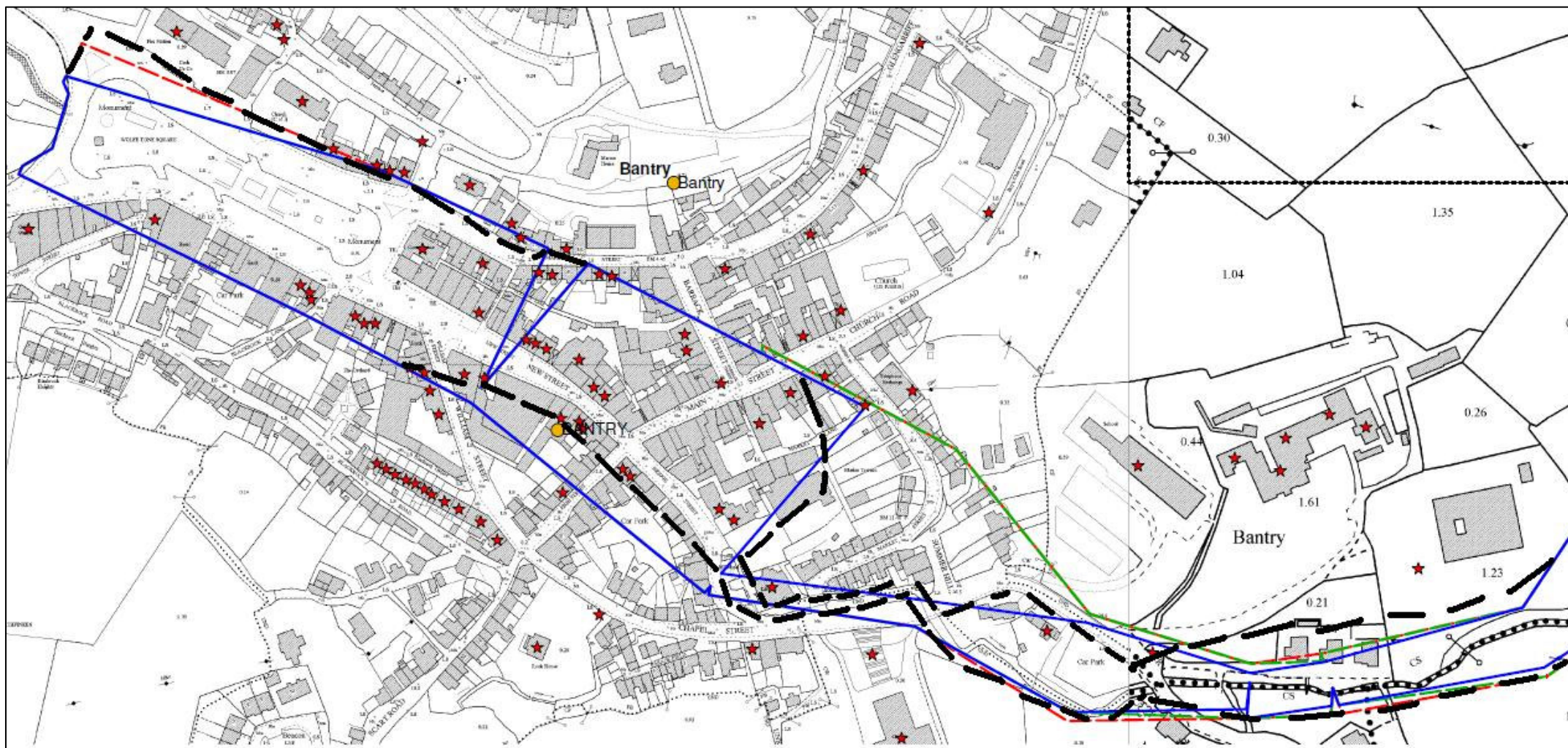
During the site visit there were no visible signs of flooding within the area.

Summary:

The fluvial flood risk outlines have been modified slightly. The initial FRI score for Bantry of over 4000 is valid. Therefore, the site is an AFA.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Black Ball Head	Hydrometric Area: 21	County: Cork
Unique OPW ID: 220316	Site Type: IRR for RR	Source of Flooding: Coastal
Surveyor: Barry O'Connor	Date: 16/12/2011	
OPW PFRA Comments: 'National Monument Score of 160 National Mon - Local Study to determine if at flood risk		
LA Feedback Comments: No Comments		
Floodmaps.ie Information: No records of flooding at this site.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: It was not possible to access this site by road so a desk based approach was used to assess flood risk. There are no flood outlines shown that interact with the receptors in this area.		
Receptor Comments: The receptors located at this site are a cluster of up to 17 Hut sites. These receptors are classified as having low vulnerability to flooding.		
Evidence of Flooding: None recorded, site not visited.		
Summary: The receptors at this site are classified as having low vulnerability and there are no flood extent outlines indicated at this site. If this area was at risk from flooding from a 10% AEP event the total FRI score for this site would be 170. This site is not an AFA.		

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Boolteens (West)	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220319	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 08/12/2011	
OPW PFRA Comments: Primary school in flood zone - Wedges in Model <u>VAL COMMENT - R1:</u> Low FRI score, no feedback from LA or OPW Region <u>APP COMMENT R1:</u> Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> None		
Floodmaps.ie Information: The website does not indicate any record of historical flooding within the risk review (RR) area although it does contain a short OPW report including a map detailing flooding at Keel ~1.5km to the south west.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site. A local person was consulted in relation to flooding of the primary school and although she was only visiting and no longer permanently living in the area, she could recall her father mentioning the river flooding many years ago and probably before the school was constructed. She also stated that works may have been carried out to the channel which slightly altered its route.		
Flood Outline Comments: The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. There are also a number of significant wedges in the model which from the site visit, appear to be overestimating flood extent in		

some areas.

Through comparison of the PFRA flood extent outlines with the topography observed on site, the outlines were modified to show a more likely flood extent as indicated on the attached map.

Receptor Comments:

Examining the revised flood lines, it is estimated that 12 residential properties can be excluded from the flood risk index.

It is possible that the primary school is also outside of the predicted flood extent outline but it is difficult to say for certain. It is worth noting that although the river channel is reasonably deep along the eastern boundary of the school and at the road crossing, it is shallower further upstream (north of the school) and therefore more susceptible to over topping.



Stream level in relation to Primary School (in background)

It is also worth noting that a new bridge has been constructed behind the school to provide access to a new residential house as shown in the picture below:



New residential access bridge behind school

Evidence of Flooding:

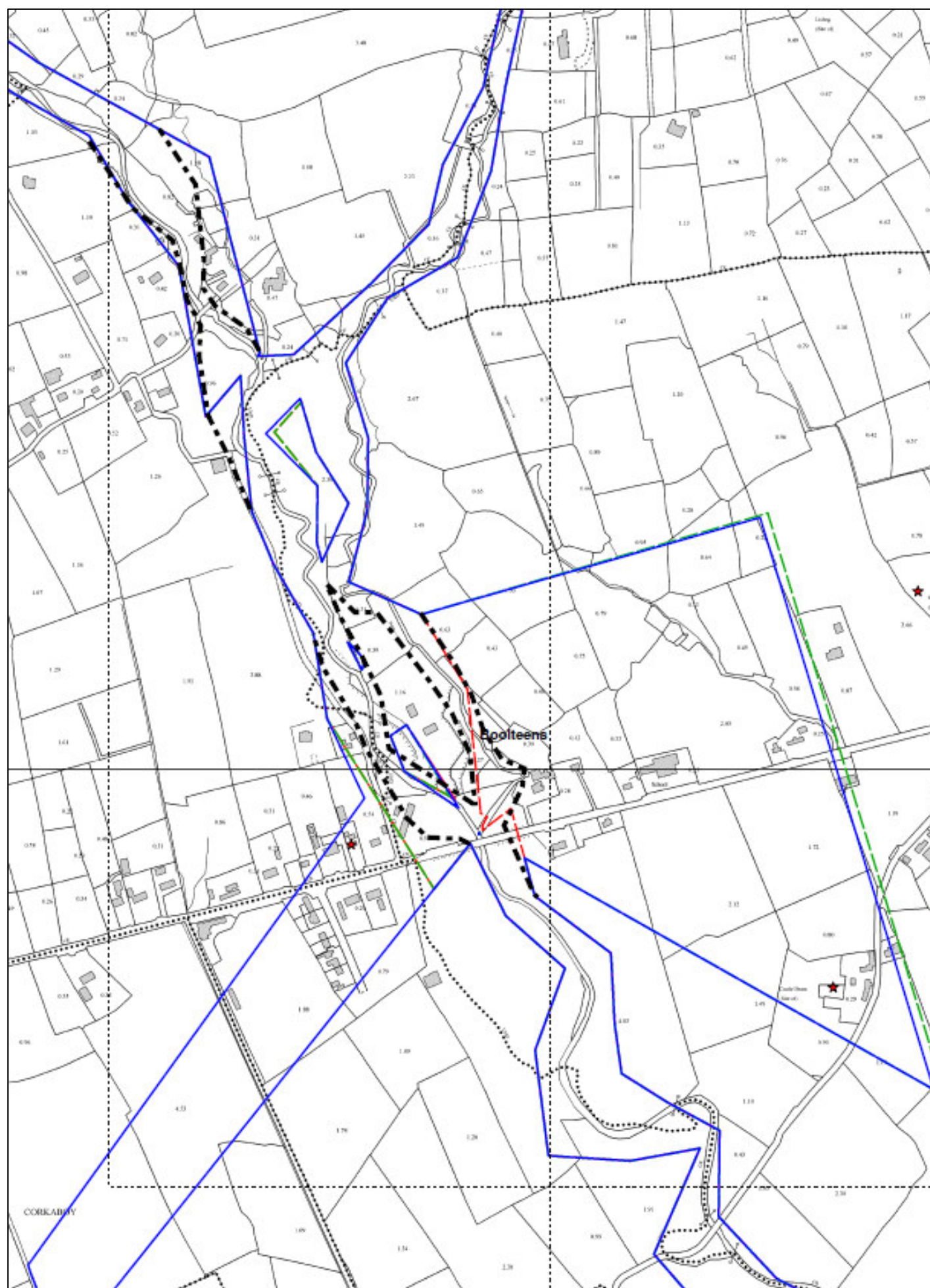
No evidence of previous flooding was observed on site.

Summary:

This site should not be designated as an AFA as there are only two receptors that may be at risk from flooding from the 10% AEP flood. While one of these receptors is a primary school it is felt that some localised protection works is the most appropriate way to mitigate the flood risk at this site.

Site Visit Findings:

Not AFA.



Revised Flood Boundary



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Boolteens (East)	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220319	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 08/12/2011	
OPW PFRA Comments: Wedges in Model <u>VAL COMMENT - R1:</u> Low FRI score, no feedback from LA or OPW Region <u>APP COMMENT R1:</u> Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> None		
Floodmaps.ie Information: The website does not indicate any record of historical flooding within the risk review (RR) area although some benefitting lands are present.		
Stakeholder Comments: As of yet no discussions/meetings undertaken with Kerry County Council.		
Predictive PFRA Flood Outline: The 10% AEP flood extent outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. There are also a number of significant wedges in the model which from the site visit, appear to be overestimating the flood extent in this area.		



Example of land rising between water course locations indicating inaccurate wedge in model.

Through comparison of the PFRA flood extent outlines lines with the topography observed on site, the outlines were modified to show a more likely flood extent as indicated on the attached map.

Receptor Comments:

Examining the revised flood extent outlines it is estimated that 8 and possibly up to 12 residential properties can be excluded from the FRI score.



Example of house at elevated level (background, LHS) to be excluded from flood boundary.

Evidence of Flooding:

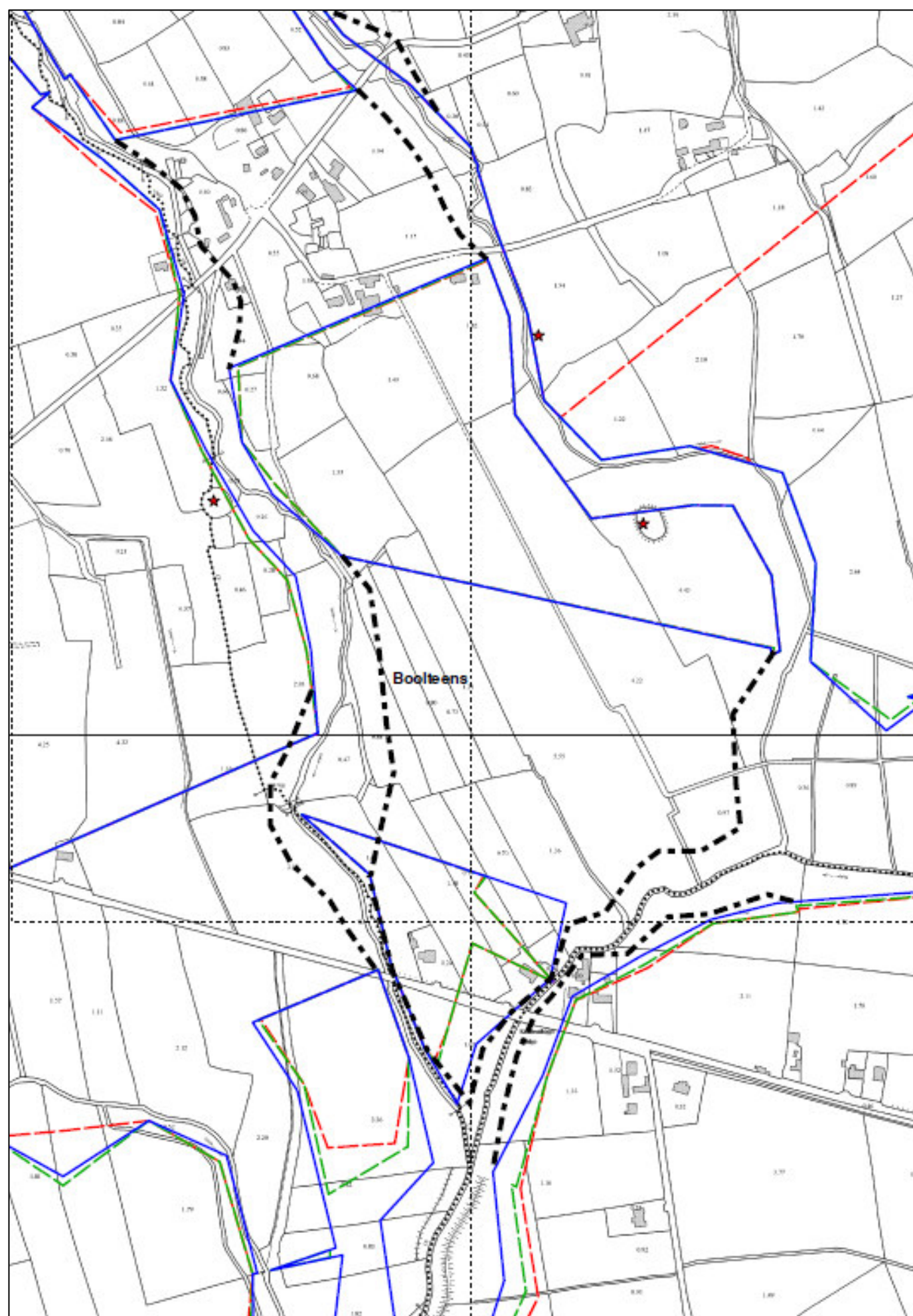
No evidence of previous flooding was observed on site.

Summary:

Since the current PFRA index is already below the threshold, the exclusion of further properties confirms no further assessment is required.

Site Visit Findings:

Not AFA.



Revised Flood Boundary



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Buttevant	Hydrometric Area: 18	County: Cork.
Unique OPW ID: 182269	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 12/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> No Flooding, Railway - Dublin Cork <u>APP COMMENT – R1</u> Risk Review - Not an APSR <u>OPW REGIONAL ENGINEER INPUT</u> Awbeg DD extends u/s of town and about 5-6 houses in Benefitting area for DD. Cork Dublin railway travels through benefitting area for DD. No other knowledge of flooding.		
LA Feedback Comments: None		
Floodmaps.ie Information: Three flood events recorded on website: 1. Mill Pond, Buttevant Recurring 2. Awbeg, Liscarroll Road, Buttevant Recurring 3. Clashnabuttry, Buttevant Recurring Only one of these flood event records are within the risk review area on the overview map. <u>Flood Event 1:</u> Minutes of a meeting with Cork County Council Area Engineer for Charleville Area on 27/04/2005 identified the following area subject to flooding. Mill Pond, Buttevant Recurring- (Flood ID 2329) Gravel ground. Bubbles up through the ground.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		

Predictive PFRA Flood Outline:

From the site visit it was noted that there appears to be some anomalies in the flood extent outlines at the east and west sides of the village. Based on the site visit the PRFA outlines have been amended as shown in the maps attached to this Site Inspection Report.

Receptor Comments:

The amendment of the Flood Extent Outline has confirmed that 1 residential property is within the flood extent area. This would lead to a total in the residential fluvial FRI of 10. There may also be a FRI associated with the Buttevant Oldbridge to the east of the town.

Evidence of Flooding:

Pipe outlets with non-return flaps were noted at the Buttevant Oldbridge.



Four eyed Buttevant Oldbridge with Non-return outlet flap at east side

Summary:

The site is not an AFA because the vulnerability of the town to flooding is very low. The old bridge may become blocked with debris during a flood and this should be monitored during a flood event.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Cappoquin	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180249	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 13/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Low FRI score, No feedback from LA or OPW Region <u>APP COMMENT – R1</u> Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R2</u> At entrance to Salterbridge House on the N72. 1 Commercial property and a recently renovated Protected Structure. Severity 3.		
Floodmaps.ie Information: Seven flood events are recorded on the Floodmaps.ie website for Cappoquin: <ol style="list-style-type: none"> 1. Flood Event: Blackwater Salterbridge Oct 2004 2. Flood Event: Blackwater Cappoquin Twig Bog recurring 3. Flood Event: Blackwater Cappoquin Boathouse recurring 4. Flood Event: Blackwater Salterbridge Kitchen-Hole recurring. 5. Flood Event: Blackwater Salterbridge recurring. 6. Flood Event: Blackwater Kilbree West recurring 7. Flood Event: Blackwater Kilbree East recurring <p>Six of these flood event records (Flood Event 1 & 2) are within the risk review area on the overview map for Cappoquin.</p> <p>Minutes of meeting with Waterford County Council (WCC) Lismore Area Engineer and District Overseers in 2006 to identify location vulnerable to regular or historic flooding in the Lismore district, also identified the following areas subject to flooding within the overview map for Cappoquin.</p> <ul style="list-style-type: none"> • River Blackwater at Kilbree East. The road is regularly impassable due to recurring flooding from the Blackwater. One house at risk. Caused by a combination of high tides and heavy rainfall. (Flood ID 3839). 		

- River Blackwater at Kitchenhole Salterbridge. The N72 National Secondary Route is regularly impassable due to recurring flooding from the Blackwater. (Flood ID 3840).
- River Blackwater at Salterbridge. The N72 National Secondary Route is regularly impassable due to recurring flooding from the Blackwater. One house at risk. (Flood ID 3841).
- River Blackwater at Cappoquin Boathouse. The boathouse is regularly flooded by the Blackwater. (Flood ID 3842).
- River Blackwater at Twig Bog Cappoquin. A car-park and car-park entrance are regularly flooded by the Blackwater. (Flood ID 3843).

Stakeholder Comments:

Waterford County Council personnel interviewed were aware of flooding in the area of the overview map for Cappoquin. The following is noted:

N72/Salterbridge/Kitchen-Hole:

The Local Authority Area Engineer confirmed that fluvial flooding occurs quiet frequently on the Blackwater River and that the N72 National Secondary Route is regularly impassable due to recurring flooding from the Blackwater. It was noted that one house adjacent to the river is at risk.

Kilbree East:

The Local Authority also confirmed that fluvial flooding occurs on the local roads in the area of Kilbree East. The road is regularly impassable due to recurring flooding from the Blackwater.

Boathouse/Twig Bog:

The Area Engineer was aware that the Boathouse floods quiet frequently at times of high tides and heavy rainfall. He also stated that prior to the construction of the new housing estate at Twin Bog the area was frequently flooded. He recalls the flood level adjacent to the car-park approx 2/3 feet above road level. He noted that since then a section of the Twig Bog has been raise and a new housing estate has been constructed. As of yet he is not aware if these houses have been affected.

Predictive PFRA Flood Outline:

From the site visit it would appear that the AEP flood extent outlines within Cappoquin are reasonably representative of the local topography and historical flood events that occurred in the area, however some minor amendments are required.

Based on the site visit the PFRA flood extent outlines for Cappoquin have been amended as shown in the map attached to this Site Inspection Report.



Little Bridge – N72 National Route



Boathouse and new houses at Twig Bog



Boathouse – River Blackwater – Avonmore Bridge

Receptor Comments:

The amendments to the predicted outlines do not significantly result in the addition/removal of residential or commercial properties to/from the Flood Risk Index (FRI). The FRI score of 179 would therefore be considered appropriate.

Evidence of Flooding:

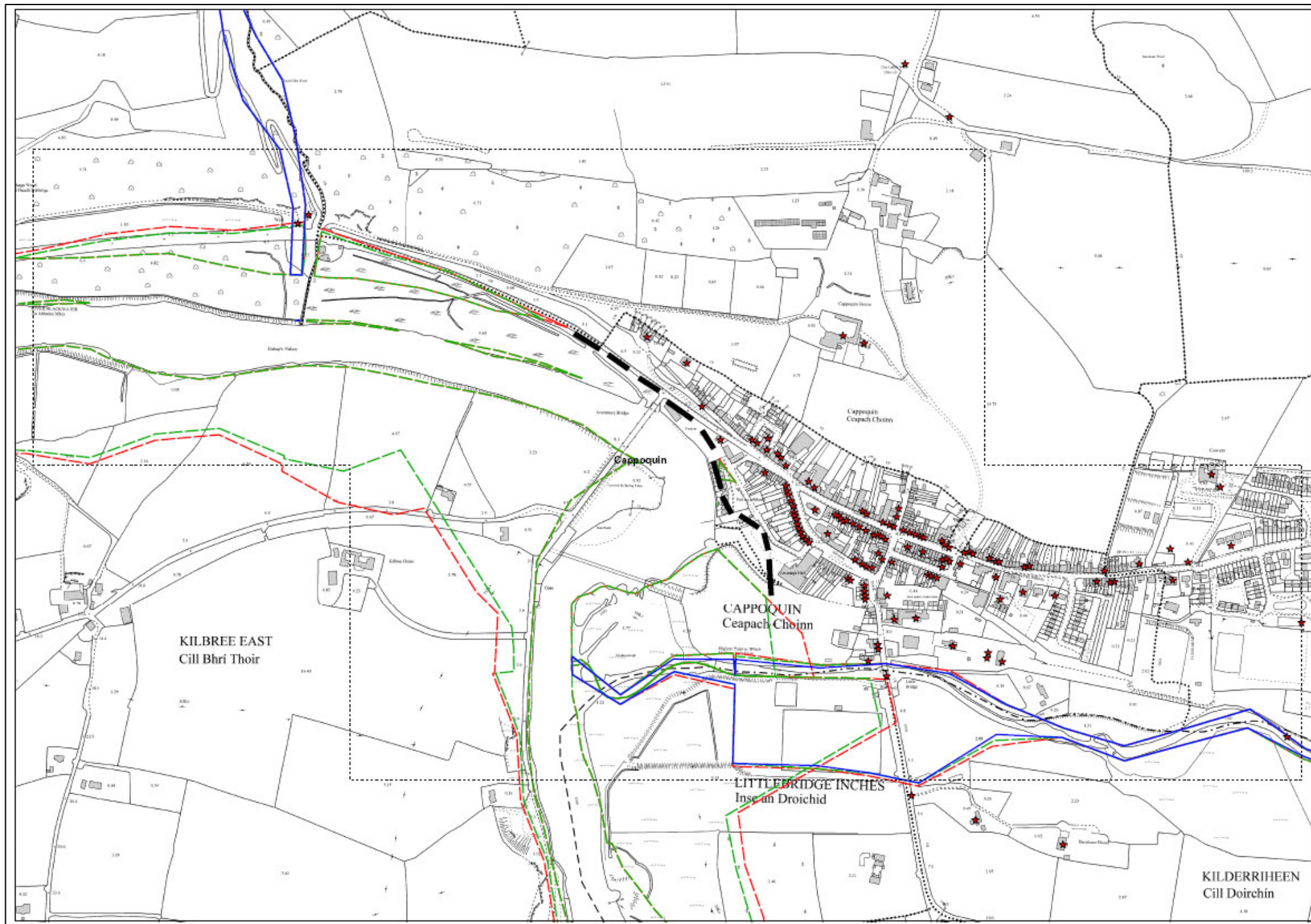
From the time of the site visit, the only evidence of fluvial flood within the risk review area for Cappoquin was the presents of washed up debris in the area of Twig Bog.

Summary:

The site is not an AFA as the FRI score for Cappoquin falls below the 250 score threshold. It is noted however from discussions with the Local Authority that fluvial flooding does occur regularly within the risk review area for Cappoquin, affecting some properties and roads adjacent to the Blackwater River.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Carrigtwohill	Hydrometric Area: 19	County: Cork
Unique OPW ID: 192399	Site Type: ARR	Source of Flooding: Fluvial & Tidal
Surveyor: Mark Cotter	Date: 16/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Lee APSR - Subject to further study- Risk review <u>APP COMMENT – R1</u> Risk Review - Not an APSR (Note: Proposed FRA by CCC)		
LA Feedback Comments: <u>LA COMMENT – R1</u> Protection, but residual risk		
Floodmaps.ie Information: Five flood events recorded on website: 1. Turlough - Ballyadam, Cork 2. Turlough - Ballyadam, Carrigane, Cork These two Turlough features are in relation to the townlands of Ballyadam and Carrigane east of the Carrigtwohill village area.		
Stakeholder Comments: No further comments noted. The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The flood extent outlines focus on two streams at the west side of Carrigtwohill village. The most westerly stream in the townlands of Tullagreen and Annegrove crosses the Cork-Midleton railway line northwest of the village. The railway line is in a cutting and the stream cascaded down the northern railway embankment in a concrete channel and flows west along the railway line. Some of the water from this stream is conveyed by a siphon up the southern railway embankment and flows through the IDA business park. This flow is limited by the capacity of the siphon and cannot flood areas south of the railway line. Flows in excess of the capacity of the siphon are conveyed		

along the railway line to the West away from the settlement of Carrigtwohill. There are a limited number of receptors that may be vulnerable to flooding from the railway. The road to the south of the railway rises to cross over the railway approximately 1km downstream of the siphon and would appear to confine flood risk between the road and the railway.

The second stream at west side of the village is in the townland of Terrysland. At the northern end of the stream a large pond feature has been constructed to attenuate flows in the stream. The PFRA outlines have been amended as shown in the attached maps included in the Appendix to this Site Inspection Report.



Railway cutting cascade at Annegrove stream.



Siphon flow from Annegrove stream south of railway cutting to the IDA business park.



Pond feature at northside of Terrysland Stream



Outlet from pond feature at northside of Terrysland Stream

Receptor Comments:

The amended flood extent outlines confirm that 4 residential/commercial premises are within the 10% AEP outline. This leads to a total FRI score of 40.

Evidence of Flooding:

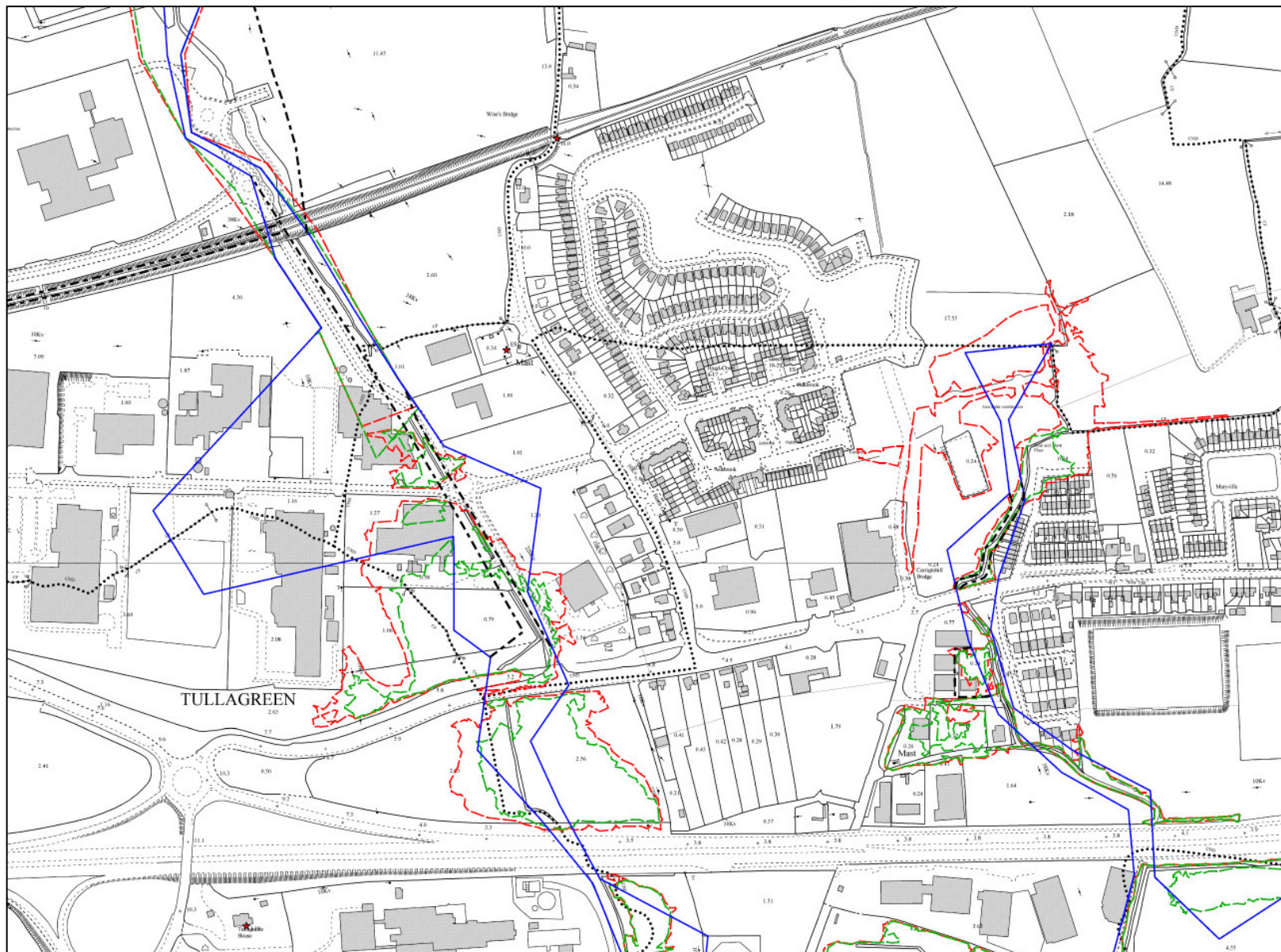
South of the N25 national road tidal flow to the estuary at the townland of Barryscourt is controlled by a Tidal gate at R624 Slatty Bridge. During high tides this gate is closed and fluvial flow is pumped from the east to the west side of the bridge.

Summary:

This site (western side of the village) is not an AFA because the risk posed to properties by fluvial flooding is minimal and tidal flooding is controlled by the Tide gate at Slatty Bridge. It was noted that a contract for a Flood Risk Assessment Study for the greater Carrigtwohill catchment was tendered in November 2011. The basis of the study is that the village of Carrigtwohill is exposed to fluvial flooding from a number of small watercourses which flow through the village. However the tender briefing document noted that the flood maps indicate that there is limited fluvial flooding in this urban area.

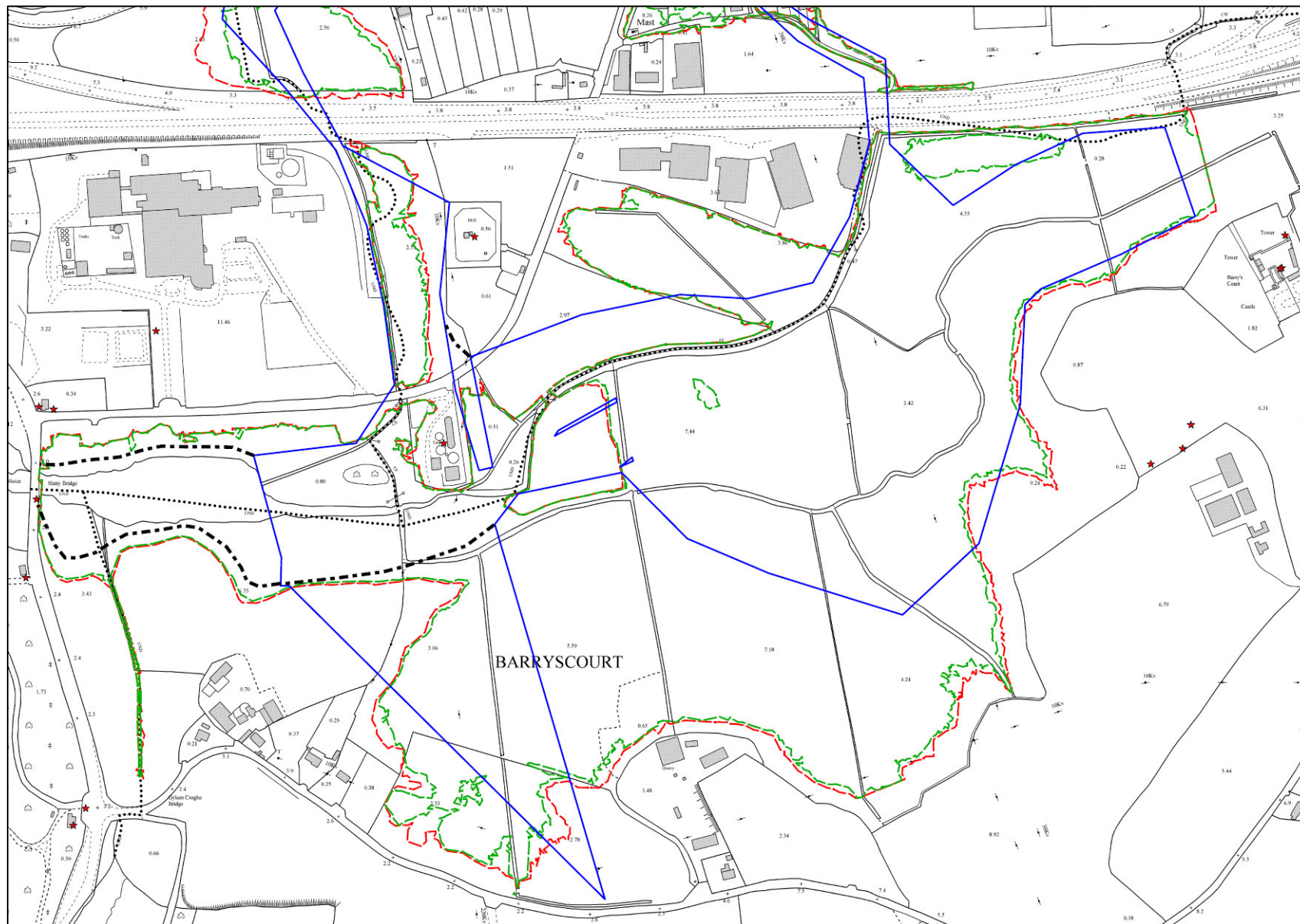
Site Visit Findings:

Not AFA.



Carrigtwohill (North)

Revised Flood Boundary - - - - -



Carrigtwohill (South)

Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Castleisland	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220323	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 12 & 13/12/2011	
OPW PFRA Comments: <u>VAL COMMENT - R1:</u> OPW Region: - Alleviation works in progress - High FRI Score may be due to model error. <u>APP COMMENT</u> predictive flood extents - Ongoing works - Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> LA are not aware of any particular flood risk here.		
Floodmaps.ie Information: The website does not contain any record of historical flooding at locations within the ARR. However, the following floods are noted in the wider Castleisland area: Churchtown (Recurring, Flood ID 3745) Stream overflows on average once per year. The L6530 is impassable for short duration during flood – hours. Ballymacpierce (Recurring, Flood ID 3745) Ballymacpierce is west of Castleisland off the N21. The L6543 gets flooded at junction roughly once every 5 years. Road is impassable for a short period – hours. Cause of the problem is swallow holes or ‘sliogars’ overflowing due to heavy rainfall/ runoff. Flooding can sometimes be caused if a ‘sliogar’ gets blocked by some litter such as plastic. Information is also provided regarding flooding at Tullig, east of Castleisland and this includes an OPW sketch of the location and various newspaper articles.		

A recently uploaded LA report also details flooding in this area in August and October 2008 whereby the Glanshearoon River overflowed at a low/weak point near Crag Cave (within ARR) and subsequently entered the Anglore stream via a nearby swallow hole.

Culverts along the Anglore Stream were then overwhelmed by the additional flow and flooding occurred at locations outside the ARR from Kilbannivan through Tobermaine towards Tullig which affected several houses and the Cordal Road. Crag Cave - an important local tourist attraction was also flooded.

In addition, some benefitting lands are identified in the area although the overlap between these and the predicted flood in the ARR is not extensive.

Stakeholder Comments:

Enquiries were made with 3 people in relation to flooding in the area. None were aware of any particular flood problems in the town. Two advised on observed depths of water in the Maine River during flood flows.

Flows at bank level and slightly above were reported for the channel section near the fire station (this is still below road level on Church Street/R577) and the man was also of the opinion that the nearby schools were not affected. He also advised that recent high flows (a week previous) had cause a section of the river walking path to collapse as shown in the below photograph:



A second man living near the bridge over the River Maine on the Killarney Road (N72) advised that he had not seen the river overtop its banks or flood his own or other properties in the time he had been there (~25 years). He advised that he had seen level rise close to the top of the bridge eyes on occasion – “to within a foot of the telecom pipe strapped to the bridge”. This pipe is on the downstream, side of the bridge and is shown in the photograph below:



The ESB were contacted in relation to the substation and the staff member responsible advised that he was not aware of any problems although he was relatively new to the position.

The LA were contacted in relation to flooding in the Castleisland and the area engineer and a supervisor were able to advise as follows:

Neither were aware of flooding problems at the ESB substation or WWTP although they were aware of some gardens which were being eroded near the ESB substation (Glanshearoon River/Stream). They advised that the OPW were aware of this and some works were to be commissioned to improve this, i.e. rock armour and/or channel dredging.

They advised that flooding due to Maine was generally not an issue but the channel would be at capacity at times and that this was having a negative effect on the banks - they mentioned the recently collapsed section of walkway as noted and photographed during the site visit. The area engineer said that as far as he was aware, the walkway was the OPW's responsibility rather than LA and it was generally maintained by the tidy towns committee.

He was also of the opinion that the River Maine channel was in need of maintenance works (dredging) as it had lost some capacity and also that high water levels had on occasion been caused by trees and debris getting caught at bridges.

Two other locations discussed were Farran (south west of town, Dysert Bridge on N23) and a graveyard near Killbannivan (north east of town, near Crag cave).

At Farran, LA staff advised that drains sometimes overflowed and that the septic tank of one house in this location was unable to discharge due to the level in the stream and that channel improvement works would help alleviate this.

At Killbannivan the area engineer mentioned that the graveyard and road were sometimes affected and that subsidence/infilling of caves may be affecting underground water routes in this area (It is thought that this flooding is most likely linked to the problems detailed in the floodmaps.ie report for August and October 2008). It is LA's opinion that The Glanshearoon River requires on going dredging works (or a more permanent alternative) to prevent flooding from occurring again.

Predictive PFRA Flood Outline:

The PFRA fluvial flood outlines in this area are extremely complex due to the convergence of multiple watercourses and drains. Extensive flood plains are indicated between converging water courses even though the watercourses themselves are often quite small.

Some of these flood areas definitely result from model error but it is difficult say for certain in some cases and to determine a more accurate boundary estimate (particularly at locations with relatively flat topography and/or multiple minor drainage channels).

Although the current PFRA fluvial outlines generally adhere to changes in topography, conversations with stake holders indicate that the flood extents are being over estimated.

As a result, although it is proposed that the outlines are altered to remove unlikely flood plains and reduce their reach, the revised outlines must also be treated with an element of caution.

In addition, it is evident from the Tullig flood reports that some areas outside of the Castleisland ARR need to be assessed, namely the Angalore Stream (including the Glanshearoon spill path) between Crag and Tullig.

Proposed changes to the flood outlines are indicated on the attached map.

Receptor Comments:

The revised flood boundaries indicate that 228 residential/commercial properties and 15 low value monuments will now be excluded from the 10% AEP boundary.

In addition, it is thought that the WWTP, ESB substation and the fire station are also outside the 10% boundary.

The two photos below show the upstream and downstream ends of the culverted stream beside the ESB substation:



Upstream end (very deep/high walls, unlikely to spill)



Downstream end (substation visible on LHS)

Excluding these receptors will result in a significant decrease in the flood risk index from 6186 to 1075. The revised index is thought to be a more accurate representation of the risk in the ARR.

Following the review of the predicted flood outlines a count was undertaken of the receptors that remained within those outlines. It was found that there were less than 20 receptors within the predicted outlines. These receptors are spread out over a large area (c 15km²).

Flood receptors on the Killbannivan to Tullig route are outside the Castleisland ARR. Since this route has not been assessed, the level of risk is unclear. However, there are approximately 70 properties on or near the reported flood route and if several residential receptors were to be included in line with reported flooding, this would bring the ARR risk index above the threshold for further assessment.

Evidence of Flooding:

High water marks were evident (some probably from reported high waters the previous week) and these appeared to corroborate accounts of flood levels given by stakeholders. Generally, the high water marks were indicated by debris lines close to the top of the river bank as shown in the photo below.

No indications of bank over topping were observed although marks on a block

wall adjacent to the fire station may be from the river (not high enough to affect roads).

A short and low embankment was noted beside the stream in the business park but it was unclear if this was for defence purposes or just a precaution doubling as a convenient use for spoil material.

In some locations masonry walls act as flood defences although this may be unintentional.



High water debris on banks of River Maine in town

Summary:

It appears that the model has significantly overestimated the flood risk in the ARR and observations and discussions on site have resulted in a reduction in the flood risk index.

The worst of the flood problems reported by the LA for Castleisland occur outside the ARR although the source relates to a deterioration of the Glashearoon River channel and unmapped flow paths within the ARR. It is recommended that further risk assessment work is carried out in relation to this specific flood route (Crag to Tullig) and that channel monitoring/maintenance works are carried out on an on going basis to prevent recurrence of flooding in the interim.

With regard to receptors, there is a large variance between the risk index calculated during the PFRA mapping process and that calculated from the

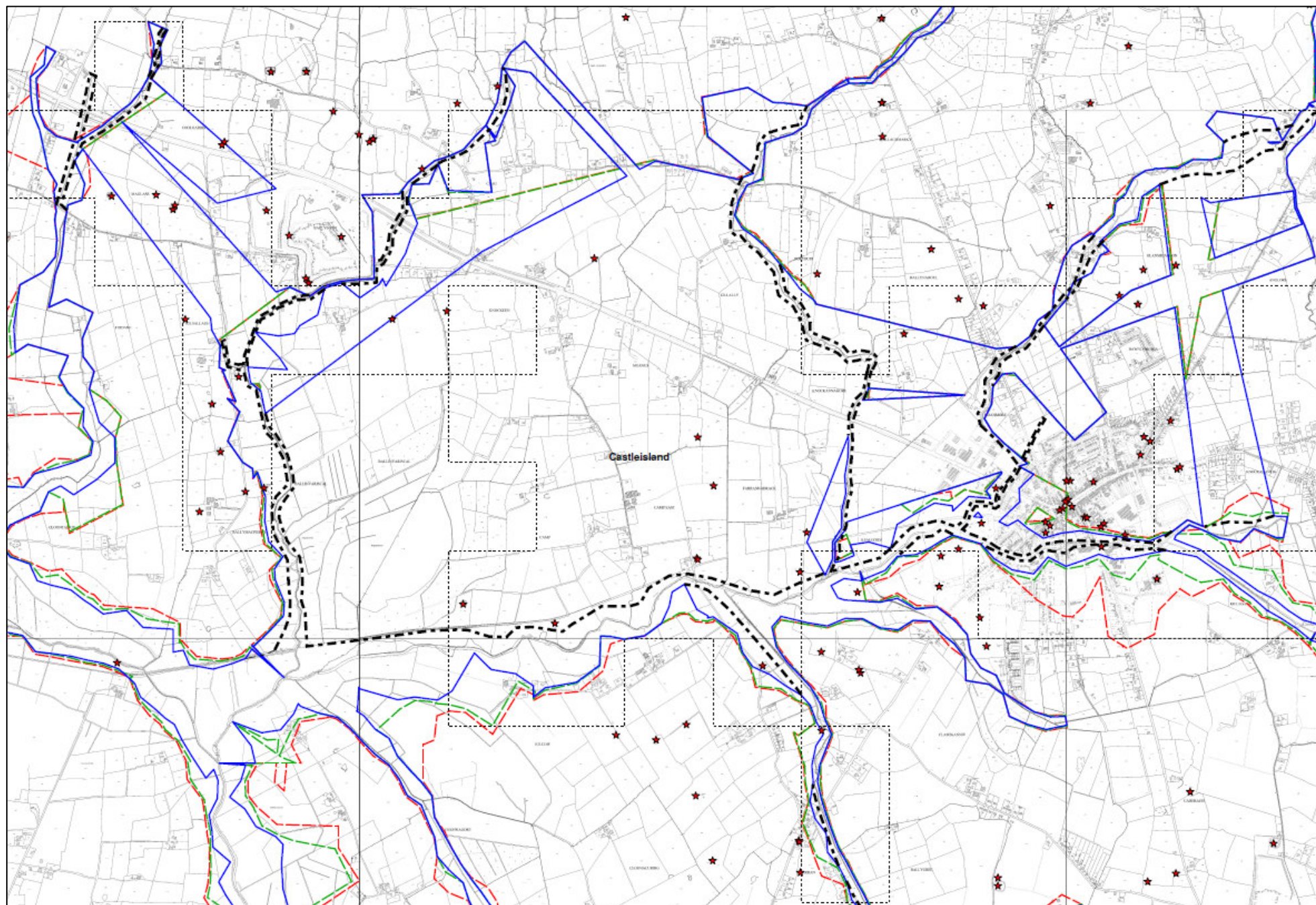
revised boundaries. Relying on boundaries revised from site walkover is not ideal for locations within the town as much of the land is quite flat and a reliable extent is difficult to determine. If channels within the town are overtopped, many properties are immediately at risk due to development along the Maine and Glanshearoon rivers.

In contrast, large areas indicated as flooding in the PFRA fluvial mapping to the west of the town have less receptors nearby and more confidence is associated with the revised boundaries.

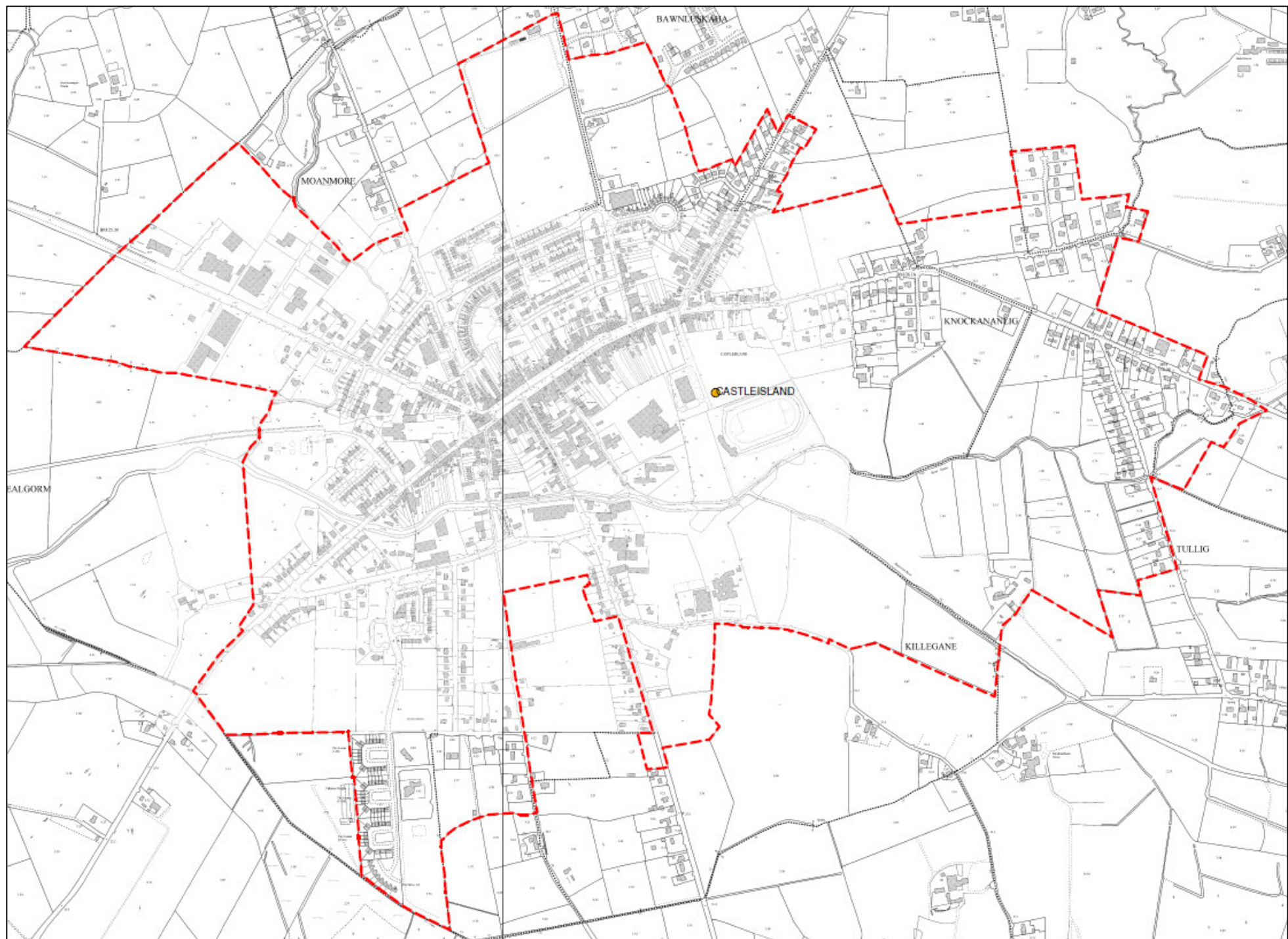
It is proposed that the area zoned for development in Castleisland and those areas identified to be at risk from the overland flow from Killbannivan to Tullig be defined as the AFA for Castleisland (see attached map). This will provide the accurate information required in relation to the assessment of flood risk where the receptors are concentrated. The extent of flood risk to the west of Castleisland could then be assessed with respect to the Medium Priority Watercourse downstream of the AFA.

Site Visit Findings:

AFA.



Revised Flood Boundary - - - - -



Proposed AFA Boundary

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Castlelyons	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180250	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 14/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> No Normal Depth Analysis, Near a Drainage District <u>APP COMMENT – R1</u> Approved - APSR		
LA Feedback Comments: <u>LA COMMENT – R2</u> Flooding an issue. Road at Bridesbride Bridge itself was flooded, no record of houses being flooded except the one at Pitch n Putt Bridge in Castlelyons itself. This individual house is at a low level.		
Floodmaps.ie Information: Three flood events recorded on website: 1. River Bride at Bridebridge recurring 2. Edgar's Cross Recurring 3. Castlelyons Kill Saint Annes Recurring Only one of these flood event records are within the risk review area on the overview map. <u>Flood Event 3:</u> Minutes of a meeting with Cork County Council Area Engineer for Fermoy Area on 22/04/2005 identified the following area subject to flooding. Land flooding at Kill-Saint-Annes near Castlelyons from river during periods of high flow - recurring Flood ID 5099.		
Stakeholder Comments: A shop owner on main street Castlelyons near Ramsey's Lane advised that flooding has only ever reach a third of the way up Ramsey's lane. That event flooded the back garden of the lady who lives in the house down the lane. The Local Authority had no specific issues in relation to this site.		

Predictive PFRA Flood Outline:

Based on the site and topography viewed during the site visit the flood extent outlines appear to be over estimated in the village and have been amended. Refer to the attached map to this Site Inspection Report.



Looking south at Ramsey Lane bridge.

Receptor Comments:

The number of residential and commercial properties within the flood extent outlines appear to be overestimated. The amendment of the flood extent outline has confirmed that only 8 residential/commercial premises are within the 10% AEP flood extent outline. This lead to total FRI score for residential/commercial properties of 80. Also, the village sewerage treatment works building is within the 10% AEP flood extent outline, which increases the FRI score by 25. Overall, the total FRI score for the village has decreased from 321 to 145.4.

Evidence of Flooding:

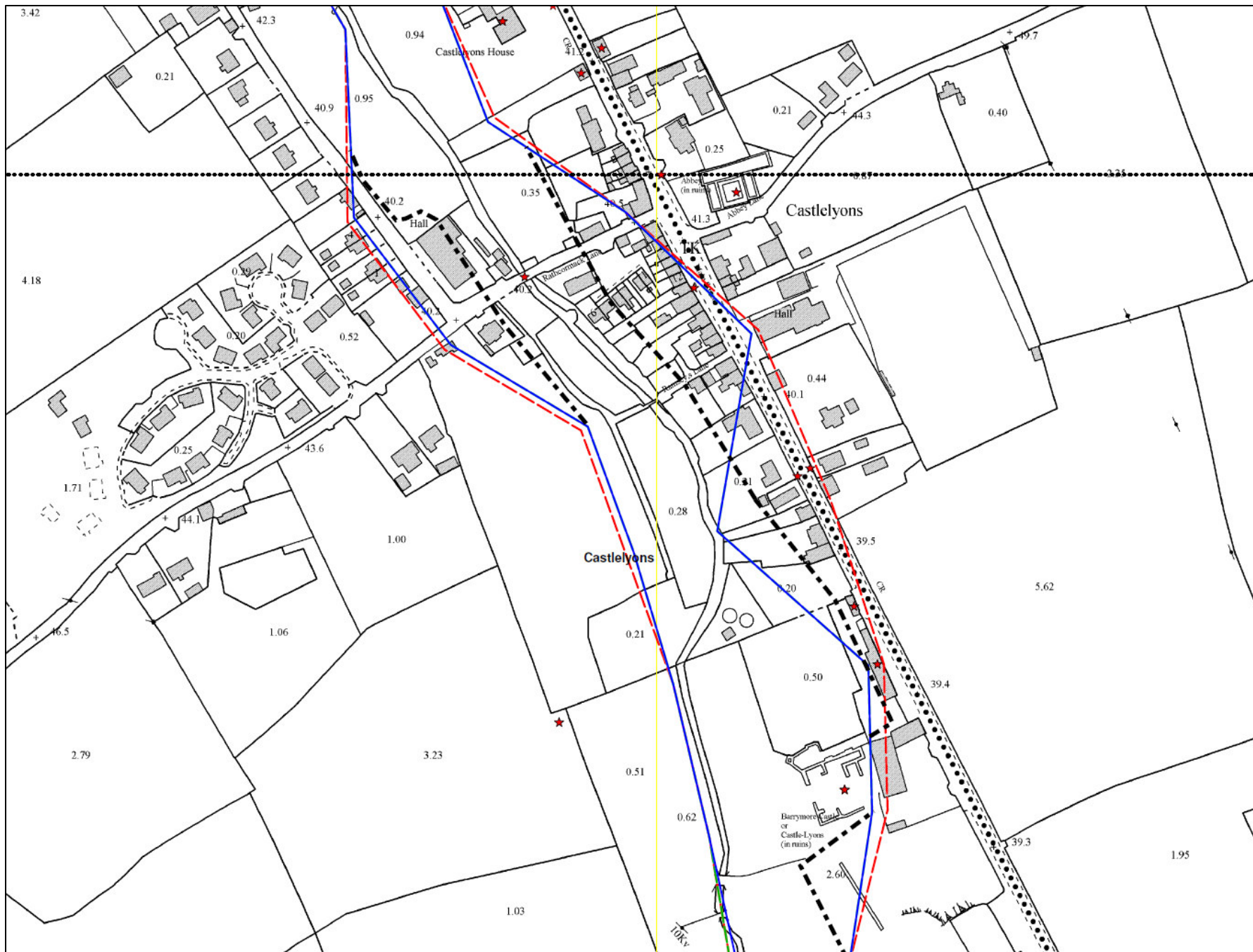
None observed.

Summary:

Following the site inspection the total FRI score for the village has been reduced from 321 to 145.4. The site is not an AFA.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Castlemaine	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220324	Site Type: CAR	Source of Flooding: Fluvial & Tidal
Surveyor: David Murphy	Date: 09/12/2011	
OPW PFRA Comments: None		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> Lands west of the village flood due to River Maine. LA asked for it to be included <u>VAL COMMENT - R1:</u> LA requested inclusion due to land flooding, FRI >250 <u>VAL COMMENT – R2:</u> LA have changed their mind - not to be included. RR just in case? <u>APP COMMENT R1:</u> R1 Approved – APSR <u>APP COMMENT R2:</u> R1 FRI = 338 - Include for Risk Review to confirm status		
Floodmaps.ie Information: The website indicates a flood event at Castlemaine recorded in February 2002. Three separate documents are available for this and these consist of an OPW memo and various photos and maps indicating flood locations and debris lines near the Annagh Bridge at Castlemaine. Large areas of benefitting land are indicated for this area and it appears that embankments prevent the river from flooding agricultural lands. Some water courses and drainage channels in this area are likely to be maintained as part of the Maine Catchment Drainage Scheme.		

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The flood extent outlines in this area are complex due to the convergence of multiple watercourses in addition to both fluvial and tidal sources being present. Embankments are present along much of the River Maine and its tributary near the Annagh bridge.



Annagh Bridge

It appears that the 10% AEP flood extent outline is missing from some areas of the map and that some large areas present where water courses converge may result from wedges in the model. As a result, it is difficult to say how accurate the flood extent outlines are.

However, from reviewing the information on the flood maps website, it is evident that large parcels of land are at risk from flooding and that despite the presence of embankments along the river, these are susceptible to overtopping during extreme events.

As a result, it is proposed that the outlines remain largely unchanged except for some minor changes which were obvious during the survey. An estimate of the 10% AEP flood extent outline has also been added.

Proposed changes to the tidal and fluvial flood extent outlines are indicated on the maps attached to this Site Inspection Report.

Receptor Comments:

Proposed changes to the flood extent outlines will result in 17 residential properties being excluded from the 10% (assumed, although low FRI score indicates these have not been included anyway) and 1% fluvial boundaries.

16 of the 17 properties can also be excluded from all three of the tidal outlines.

It is thought that the primary school remains at risk and that a sewage pumping station (located near the N70 bridge over the Maine) may also need to be added to the FRI score.



Sewage pumping station near N70 Bridge

Evidence of Flooding:

Embankments are present in this location and their condition varies. Some sections appear to be reasonably well maintained while others are quite overgrown. Additional heaped material near the Maine Bridge also appeared to be for defending either the school or the pumping station mentioned above.

Historic 6 inch maps from OSI indicate that much of the land was previously liable to flooding.

High water marks appear to indicate normal high water levels as opposed to extreme flood levels. Photos from the flood maps website indicate extent of previous flood.



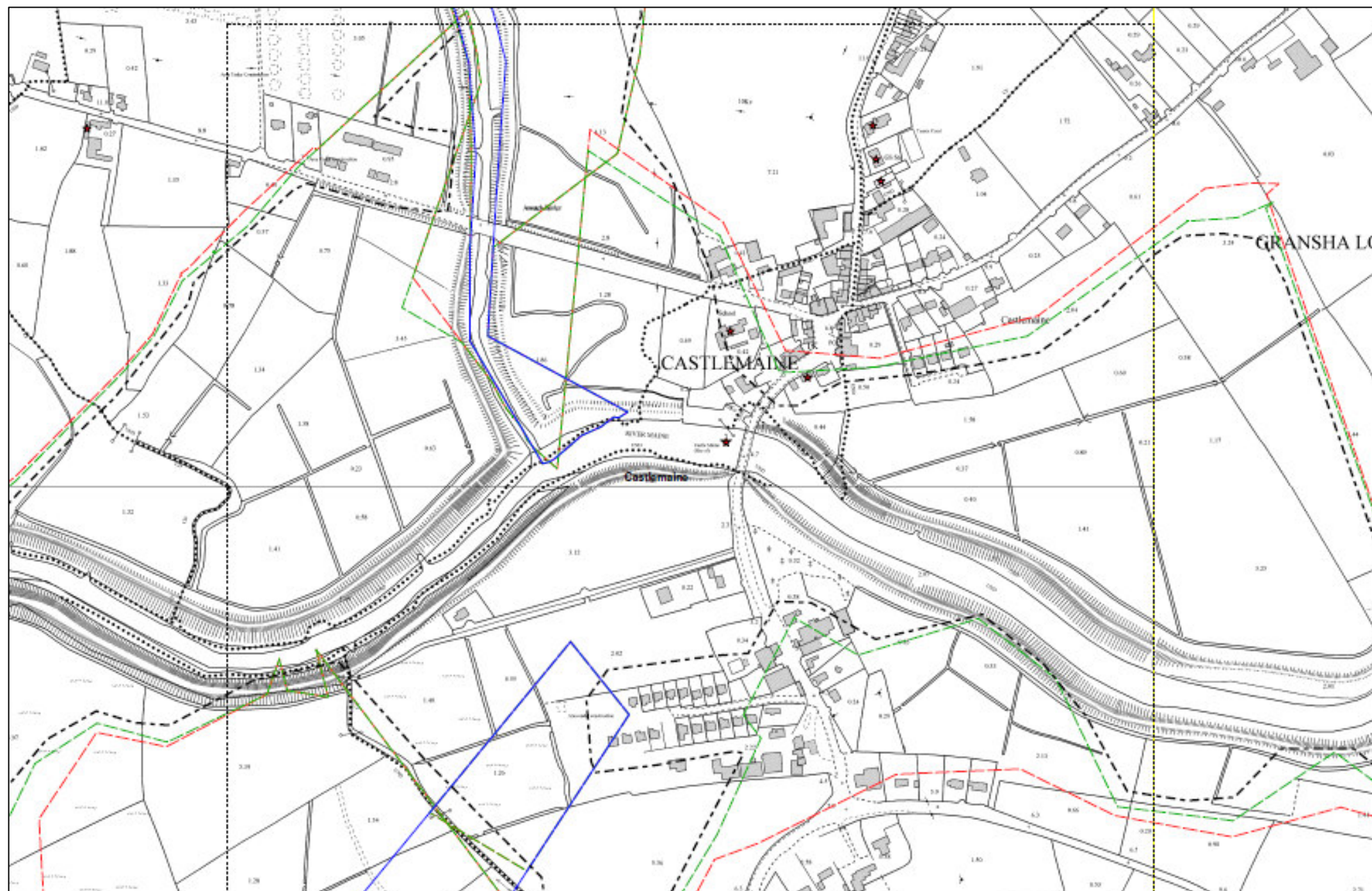
Overgrown embankments and high water marks at Castlemaine. (Taken from N70 Bridge, facing west (upstream))

Summary:

The flood extents in this area have been over estimated. Following the on site inspection it is appropriate to reduce the FRI score by 170 in respect of the 17 properties which are not at risk from the 10% event. This reduces the FRI to 168. It is also appropriate to add 25 to the FRI to account for the pumping station that may be at risk from extreme flooding. This gives a final FRI score of 193 which is below the threshold for further assessment.

Site Visit Findings:

Not AFA.



Revised Flood Boundary





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Castlemartyr	Hydrometric Area: 19	County: Cork.
Unique OPW ID: 190277	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 07/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Some properties and N25 at risk. <u>APP COMMENT – R1</u> Approved – APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Shallow bed level. Handful of low-lying properties. N25 closures (Youghal side rather than City Side). Bridge is a restriction (3 eye).		
Floodmaps.ie Information: Three flood events are recorded on the Floodmaps.ie website for Castlemartyr: <ol style="list-style-type: none"> 1. Flood Event: Castlemartyr, Middleton, Co. Cork 19th November 2009 2. Flood Event: Garranejames, Killeagh, Co. Cork. 19th Nov 2009 3. Flood Event: Castlemartyr, Co. Cork Recurring. (Flood ID 2209) <p>Two of these flood event records are within the risk review area on the overview map.</p> <p><u>Flood Event 1:</u> This flooding event started on Thursday 19th November 2009. The peak flood occurred on Thursday 19th November 2009. The source of the flood waters was a river (and the cause was channel overtopping). The flooding occurred in the Womanagh catchment, on the Kiltha River. The maximum flood level (metres OD Malin) was 9.75m with a flood depth (metres) of 0.25m. Three residential properties were affected by the flooding event and 100m of the local road L3805 was flooded. Some pasture lands were also flooded.</p> <p><u>Flood Event 3: Flood ID 2209</u> Minutes of a meeting with Cork County Council Area Engineer for Youghal Area</p>		

on 20/04/2005 identified the following area subject to flooding. Castlemartyr flooding problem at Bridge, capacity problem, properties on the right hand side have been effected in past, approximately frequently of once every two years – recurring.

Stakeholder Comments:

During discussions with the Pharmacist in the local pharmacy, she stated that fluvial flooding had occurred in Castlemartyr in 2009 at the location of the bridge. She also recalled flooding to the back door of the pharmacy approximately 4 to 5 years ago, but no flooding at the building during 2009. It was noted that this flooding was probably not from the river but possibly occurred due to a drain blockage.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. From the site visit it would appear that the river flood outline west of the Castlemartyr Bridge appears to be overestimating the flood extent in this area. The ground levels rise in a western direction along the N25 National Road at this location and the outlines therefore require to be modified due to the changes in the topography.

Based on the site visit the PFRA outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Castlemartyr Bridge - N25 National Road



Kiltia River – South of Castlemartyr Bridge

Receptor Comments:

The amendment of the flood extent outline has confirmed the removal of 22 Residential/Commercial properties and a health centre from the flood extent area. This leads a reduction of 245 from the total FRI score. This reduces the FRI score from 686 to 441.

Evidence of Flooding:

During the site visit it was noted that localised flood defences including sand bags were present at some of the entrances to the properties along local road L3805 (Mogeely Road) just north of Castlemartyr Bridge. Some of these properties were affected by the previous flooding events.

Flap non return valves are also present at river banks near the bridge proving evidence of high water level occurring at these locations.

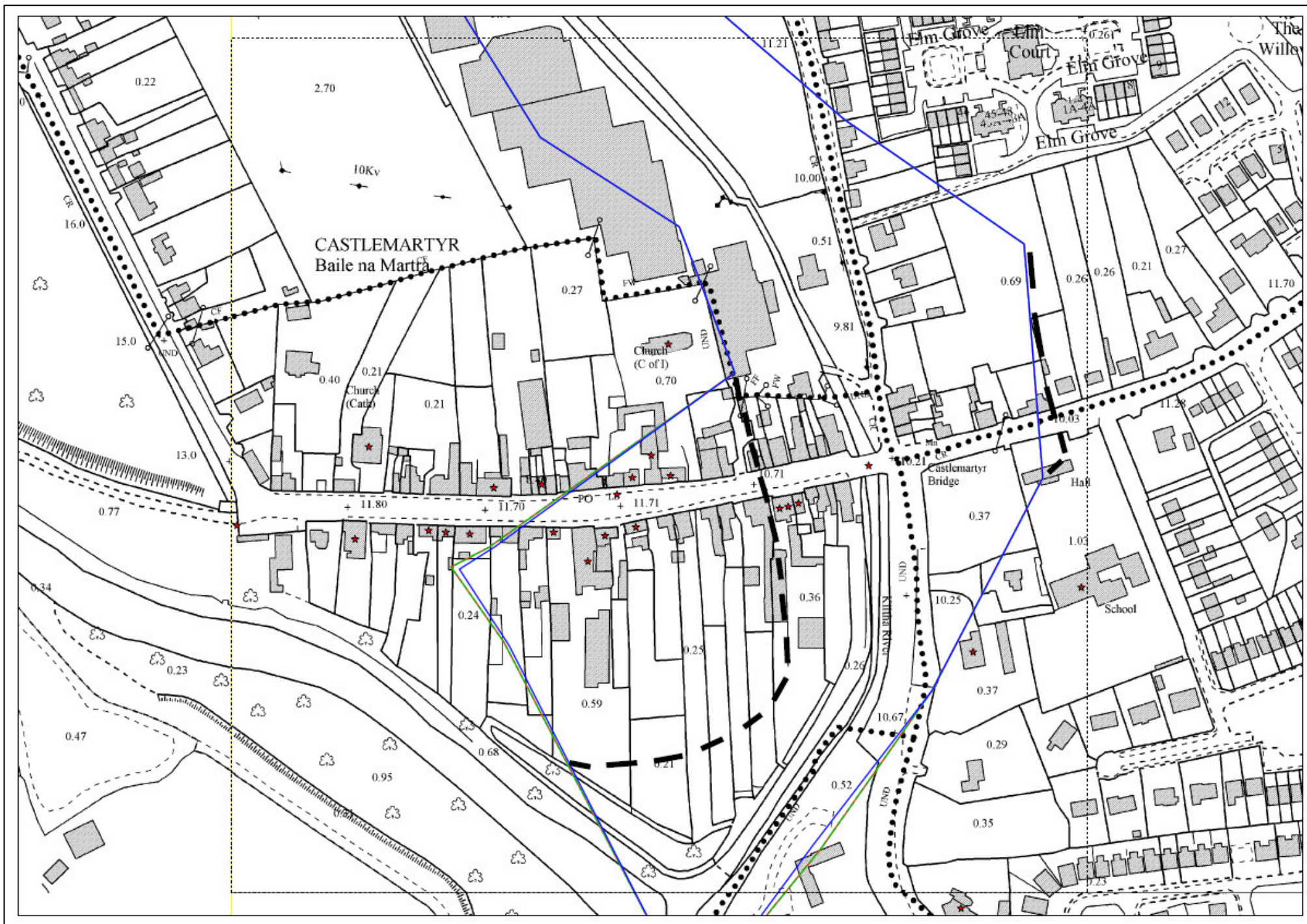
It was further noted that there appeared to be evidence of water marks present on the outside of the Hall building, located just off the N25 National Road.

Summary:

The site is an AFA as it would appear that over 30 residential / commercial properties are at risk from flooding from the river.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Castletown Bearhaven	Hydrometric Area: 21	County: Cork
Unique OPW ID: 210308	Site Type: ARR	Source of Flooding: Costal & Fluvial
Surveyor: Tony Donovan	Date: 14/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Coastal Flooding – Low Historic Data <u>APP COMMENT – R1</u> Risk Review – Confirm with ICPSS Flood Maps when available		
LA Feedback Comments: <u>LA COMMENT – R1</u> Check everything <u>LA COMMENT – R2</u> Minor coastal flooding. Also pluvial flooding		
Floodmaps.ie Information: The website contains only one document. The document is a copy of minutes of a meeting between CCC and the ESBI. These minutes relate to data collection as part of the OPW Flood Hazard Mapping project. However, the minutes do not contain any information relevant to Castletown Bearhaven.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The fluvial flood risk outlines within the APSR boundary of Castletown Bearhaven are minor as only a short section of the river to the north east of the town is included within the boundary. However, from the site visit the 10%, 1% and 0.1 AEP fluvial flood outlines were modified.		

The coastal outlines for the 10% AEP, 2% AEP and 0.1% AEP events appear reasonable and following the site visit no changes or modifications were made to the outlines.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report. No changes are recommended to the coastal outlines.



Castletown Bearhaven



River – Castletown Bearhaven

Receptor Comments:

Due to the modification of the fluvial outlines 1 residential / commercial property has been removed from the 10% AEP outline and 3 residential / commercial properties from the 1% AEP outline. From the maps and site visit this would appear to be the removal of all receptors from the fluvial flood risk outlines and would result in a reduction in the score of 13 points.

However, the FRI score provided for Castletown Bearhaven includes a total fluvial score of 65. This score is comprised of 10 for residential, 30 for commercial and 25 for a WWTP. The site visit did not identify these receptors as being within the fluvial flood outlines.

As the site visit confirmed the removal of all receptors from the fluvial flood risk outlines, it is deemed appropriate to deduct the score of 65 from the total FRI score of 393.97 for Castletown Bearhaven.

The FRI score of 393.97 for Castletown Bearhaven also includes a total tidal score of 328.97. As the coastal outlines have not been modified, this score remains resulting in the total FRI score exceeding the threshold score.

Evidence of Flooding:

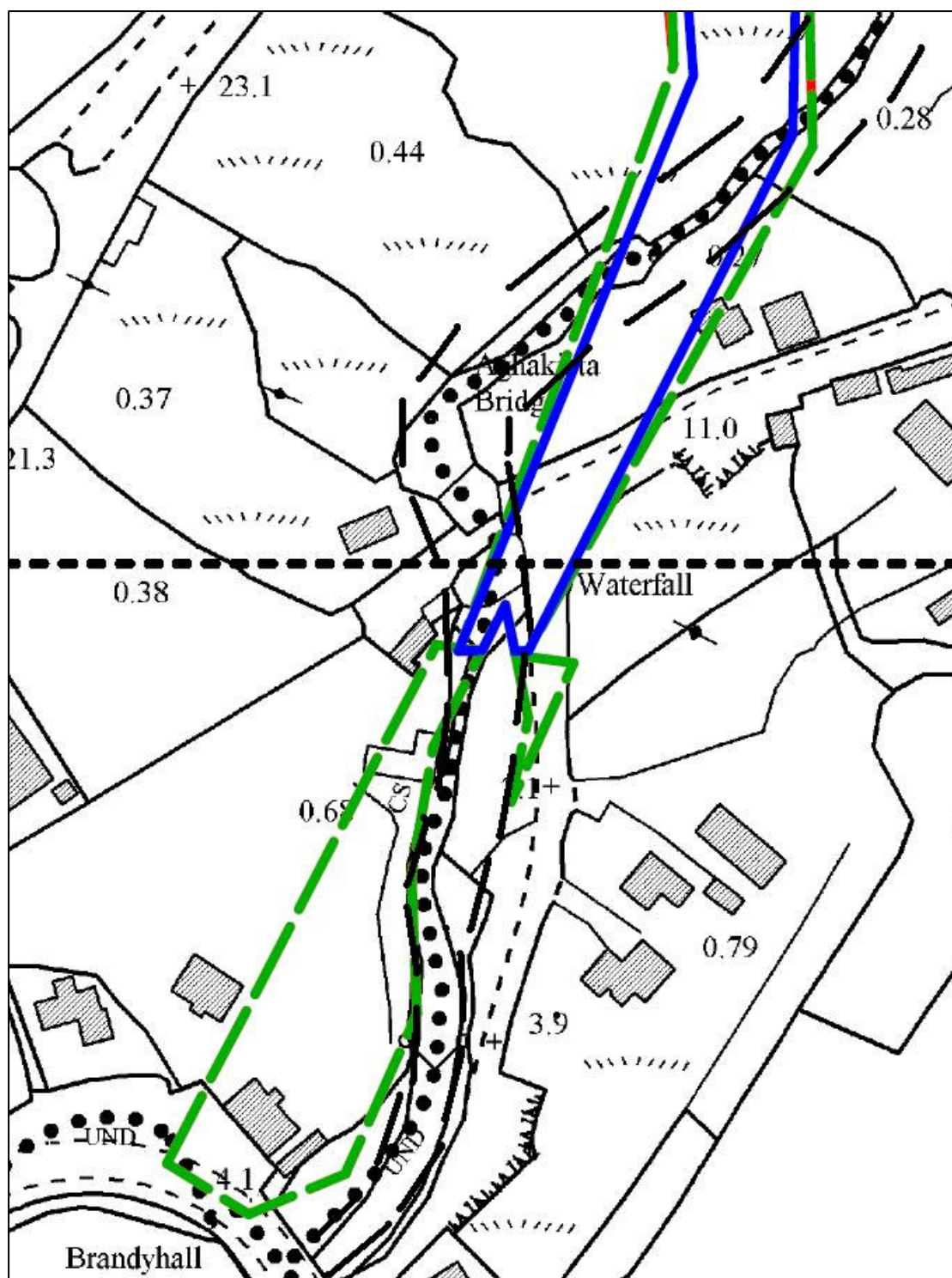
During the site visit there were no visible signs of flooding within the area.

Summary:

The fluvial flood risk outlines have been modified and the FRI score has been reduced by 65. The coastal flood risk outlines have not been modified and the contributing score of 328.97 from receptors remains resulting in the FRI exceeding the threshold score. The site is an AFA.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Clashmore	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180251	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 09/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Low FRI Score, No concerns from LA or OPW Region <u>VAL COMMENT – R2</u> LA reported property flooding at second workshop. RR? <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R2</u> Properties at end of street get flooded. Bridge constraints		
Floodmaps.ie Information: Three flood events are recorded on the Floodmaps.ie website for Clashmore: <ol style="list-style-type: none"> 1. Flood Event: Licky Ballyheeny Bridge recurring 2. Flood Event: Creggagh Clashmore Bridge recurring 3. Flood Event: Creggagh Coolbooa Bridge Clashmore recurring <p>Two of these flood event records (Flood Event 2 & 3) are within the risk review area on the overview map for Clashmore.</p> <p>Minutes of meeting with Waterford County Council (WCC) Dungarvan Area Engineer and District Overseers in 2006 to identify location vulnerable to regular or historic flooding in the Dungarvan district, also identified the following areas subject to flooding within the overview map for Clashmore.</p> <ul style="list-style-type: none"> • Coolbooa Bridge at Clashmore – recurring flooding of Regional road R671 due to high flows in river. One house adjacent to river affected. 		

(Flood ID 3806).

- Clashmore Bridge – recurring flooding of Regional road R671 due to high flows in the river. Properties at lower end of street affected. (Flood ID 3806).

Stakeholder Comments:

Waterford County Council (WCC) personnel interviewed were aware of flooding in the area of Clashmore. The following is noted:

Cloobooa Bridge:

The Local Authority confirmed that fluvial floods occur quite often (every year) at the location of the Cloobooa Bridge in Clashmore, where the Greagagh River runs under the R671 Regional Road. One house adjacent to this bridge is vulnerable to regular flooding. WCC are currently looking to replace this bridge and carry out flood defence works. An assessment is currently being undertaken to determine the consequences with respect to flooding if the Cloobooa Bridge is replaced.

Clashmore Bridge

The Local Authority also confirmed that fluvial flooding occurs at the location of the Clashmore Bridge in the village of Clashmore. If floods occur at this location then the adjacent properties are affected. WCC personnel recalled flooding along the main road and the recalls the bridge impassable to cars following flooding in 2010. It was noted during the site visit that the 4 number eyes of the bridge are quite low which may result in over spilling to the adjacent area in times of high flow.

During discussions with two local residents from Clashmore, they stated that flooding had previously occurred at both the Clashmore Bridge and Coolbooa Bridge within Clashmore village. They confirmed that the one residence adjacent to the Collbooa Bridge and a number of properties adjacent to the Clashmore Bridge were affected. The two local residents also stated that flooding does occur to a pub along the main street in Clashmore, however it was noted that this was due to surface water rainfall flowing down the hill of the main street and entering the premises during times of heavy rainfall.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the AEP flood extent outlines within Clashmore are not representative of the local topography. The amendments to these outlines do not significantly result in the addition/removal of residential or commercial properties to/from the Flood Risk Index (FRI).

Based on the site visit the PFRA outlines for Clashmore have been amended as shown in the attached map.



Cloobooa Bridge - R671 Regional Road



Clashmore Bridge - R671 Regional Road



Clashmore Bridge - R671 Regional Road

Receptor Comments:

The amendments to the AEP flood extent outlines do not significantly result in the addition/removal of residential or commercial properties to/from the Flood Risk Index (FRI). The FRI score of 191.2 would therefore be considered appropriate.

Evidence of Flooding:

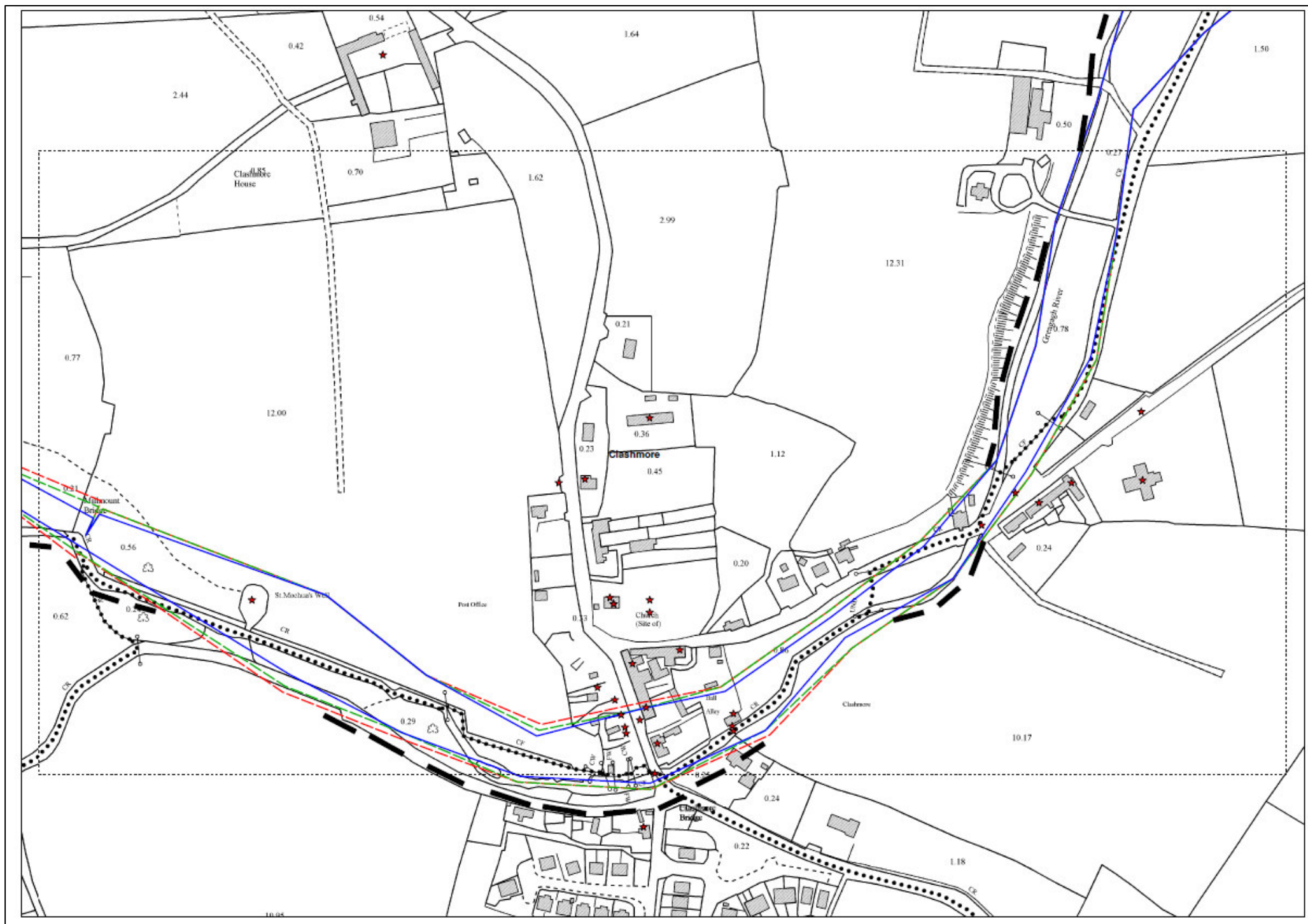
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Clashmore.

Summary:

The site is not an AFA as the FRI score for Clashmore falls below the 250 score threshold. It is noted however from discussions with the Local Authority and local residents that fluvial flooding does occur regularly within the risk review area for Clashmore, affecting some properties adjacent to the Greagagh River.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Clonakilty	Hydrometric Area: 20	County: Cork
Unique OPW ID: 200294	Site Type: CAR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 16/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> Circa 40 properties in benefiting area of 'Myles and Templebryan DD. Town reputed to be subject to tidal flooding also and a barrage is indicated as an objective in LAP <u>VAL COMMENT – R1</u> High FRI Score, High Severity from LA <u>APP COMMENT – R1</u> Approved - APSR - Ongoing Study		
LA Feedback Comments: <u>LA COMMENT – R2</u> Major coastal flooding an issue. Also pluvial flooding		
Floodmaps.ie Information: The website contains a number of files including newspaper clipping, correspondence, minutes, maps and reports. Documents include: <ul style="list-style-type: none"> • CCC correspondence regarding flood event of the 6th/9th January 1996 – includes cost estimates of damage. • Clonakilty Flood Study (July 2003) – Report and Flood Extent Map • Minutes of Meeting – meeting between CCC and ESBI regarding data collection in relation to the OPW Flood Hazard Mapping project. • CCC Flood Event Report on 19th November 2009 Flood Event – report includes description and photographs of flooding along with a flood extent map. • Preliminary Report on Clonakilty Tidal Barrage (1992) • Summary Report of Rainfall and Flooding on 5th November 2000 • Clonakilty Flood Relief Scheme – Scoping Report (Draft 2010) • Environmental Impact Statement for Tidal Barrage within Clonakilty Harbour – Volume 2 Main EIS Document 		

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

Overall the predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar and appear reasonable. There appears to be no major wedges or anomalies. However, to the west of the town there appears to be an outcrop within the 10% AEP, 1% AEP and 0.1% AEP fluvial outlines which appears to identify the area as not at risk.

From the site visit it would appear that the outcrop within the fluvial flood outlines is an error, the outline has been modified and properties within have been identified as at risk.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report. No changes are recommended to the coastal outlines.



View of River upstream of Town



View of River in the Town

Receptor Comments:

The initial FRI score for Clonakilty was 4141.36 which is well above the threshold score. Additional receptors were included within the flood risk outline with the removal of the outcrop section.

Evidence of Flooding:

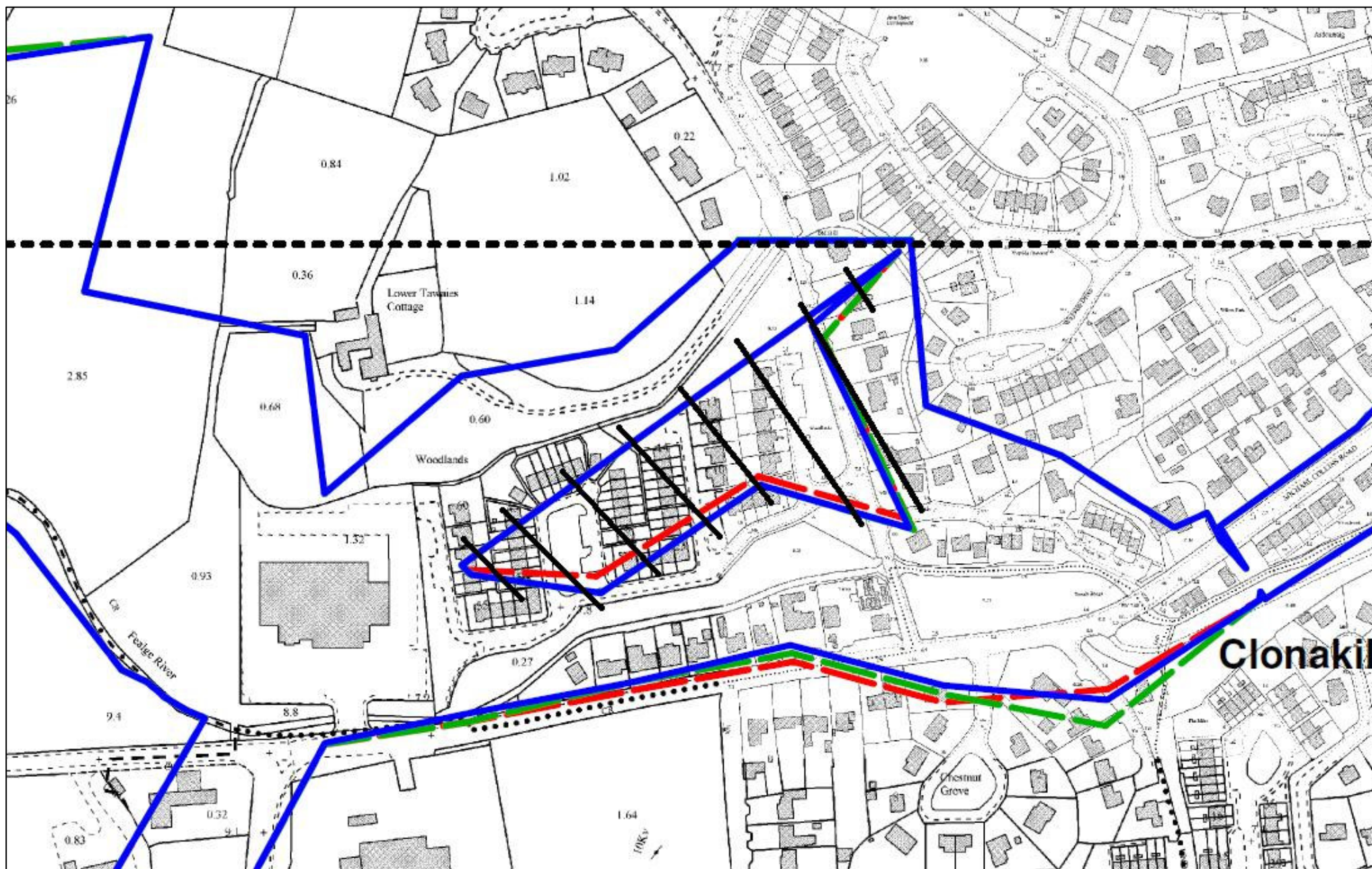
During the site visit there was no evidence of flooding.

Summary:

Based on the site visit the fluvial flood risk outlines were modified to include additional properties. As the initial FRI score was well above the threshold score the site is an AFA.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Coachford	Hydrometric Area: 19	County: Cork.
Unique OPW ID: 190273	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 8/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> FRI Score < 250, No concerns expressed by LA or OPW Region <u>VAL COMMENT – R2</u> VAL R2 – RR requested by LA. <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> FRI = 235 - Local watercourse not covered by Lee CFRAM - Include for Risk Review to confirm status - Possible Minor Schemes solution		
LA Feedback Comments: <u>LA COMMENT – R2</u> Should be included in Risk Review.~Have been flood events in the past.~ ~Local watercourse has flooded several properties. Also look into Dripsey.		
Floodmaps.ie Information: No flood events recorded on the website.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site. Contact was made with local residents in the area and description of the flooding history was recorded. <u>Residents Discussion 1 – Owner of Pharmacy and local pharmacy customer:</u> Owner and customer both noted that flooding has recently become more frequent that it used to be and it was recently discussed in a local meeting with a local Councillor, who has been investigating the flooding. The customer mentioned that recent sewer camera survey work was undertaken in the village. She believes that there is a large culvert under the road, which can be		

accessed by personnel and used to be cleaned regularly in previous years. However, she thinks that the culvert ends in a dead-end into earth and she doesn't know how water flowed out of it (possible partial collapse/blockage of culvert). She mentioned that the pub on the north side of the street is flooded regularly and that water came out of the ground in the creamery yard north of the road from the pharmacy in 2009. The customer lives on the hill northwest of the village past the school and mentioned that large amounts of surface (pluvial) flood flow come down this road regularly. It was also noted that the GAA grounds flood when the drainage gullies get blocked, but the GAA grounds keepers regularly free the blocked grills.

Residents Discussion 2 – Owner of Gala shop:

Shop owner noted that one of the main streams in the village approach from the back of his shop (possible from the northeast) and is culverted under the houses near his shop. He noted that the culvert is under capacity and water can sometimes come up to the back of his shop. On occasion, he has had to pump water from behind his shop across the road and the water level outside his shop front reaches the top of the footpath. In addition, he noted that the two houses east of his shop can have water running in the back doors and out the front doors. Sand bags were noted outside both these houses.

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% AEP flood extent outlines from the PFRA analysis are coincident. Based on eye witness accounts and topography in the village the flood extent outlines have been amended. Refer to the map attached to this Site Inspection Report.

Receptor Comments:

The number of the residential/commercial receptors within the flood extent outlines remain approximately the same. However, it was noted that the Health Centre receptor appears to be a Community Centre building.

Evidence of Flooding:

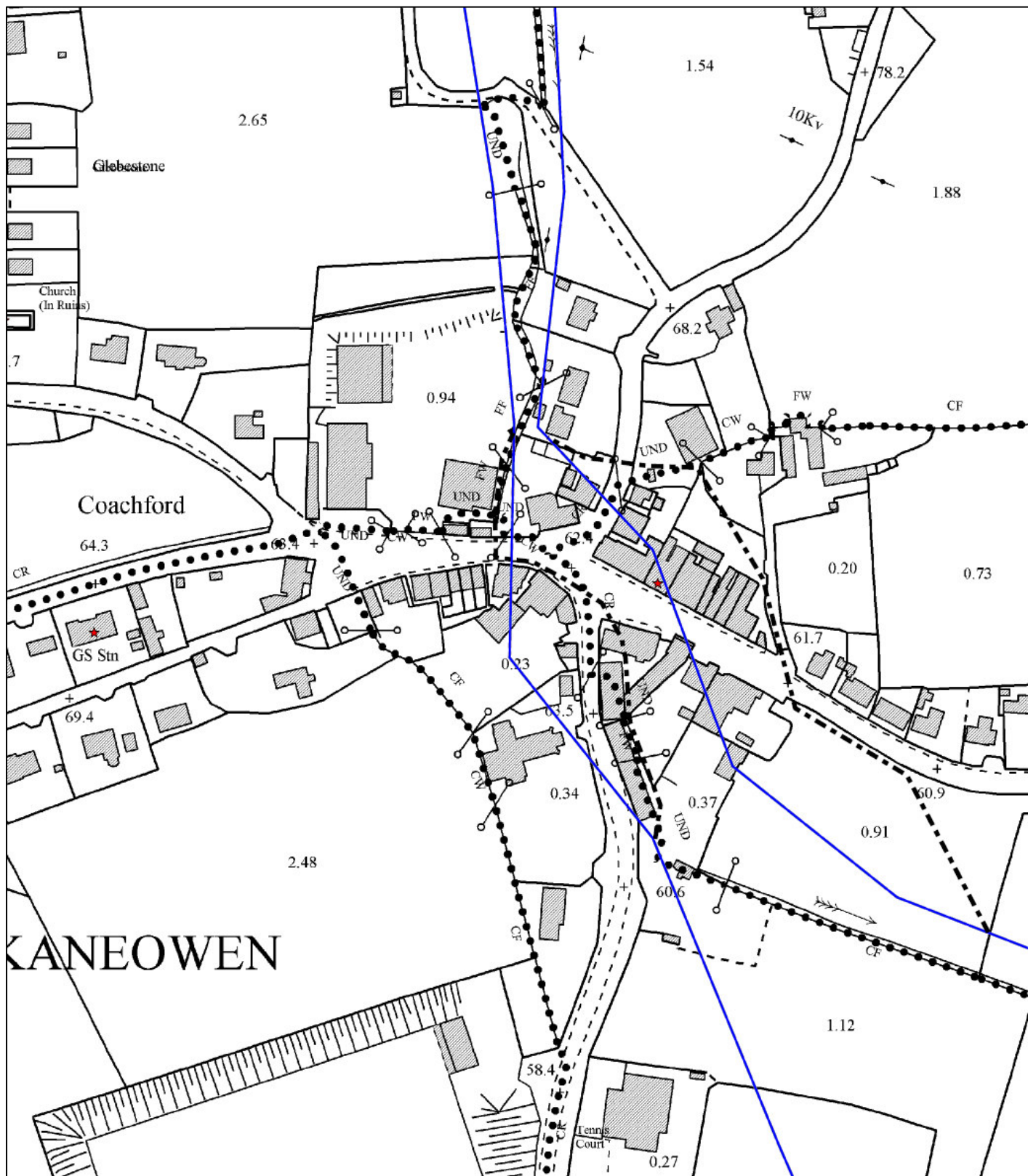
During the site visit, it was noted that localised flood defences including sand bags were present at some of the entrances to the properties along Main Street.

Summary:

This site is not AFA because the number of receptors affected by the flooding is low and the flooding is mainly due to pluvial flow associated with blocked gullies and culverts. Flood water approaches the village from the north, northeast and northwest and leaves the village to the southeast. However, it may be beneficial to follow up on the camera survey results and investigate if maintenance works and/or replacement of the culverts in the village are required.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Coolroe Lower	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220325	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 15/12/2011	
OPW PFRA Comments <u>VAL COMMENT - R1:</u> School in Flood Zone - Risk Review <u>APP COMMENT R1:</u> Isolated school at risk - Risk Review and possible minor works - Not an APSR		
LA Feedback Comments: None		
Floodmaps.ie Information Three flood events are noted within 2.5km of this location but these are not relevant to the risk review (RR) area.		
Stakeholder Comments: Enquiries were made at the school and it was advised that during times of high flow, the stream sometimes overtops and flows through part of the field behind the school and between the tower and the stream channel on the school grounds as shown in the photo below: He advised that water does not enter the building since there are no doors at the back of the building and that water flows downhill towards the boundary wall adjacent the road (away from the building). He also advised that a number of blocks were removed from the boundary wall to prevent water from ponding at this location. The Local Authority had no specific issues in relation to this site.		



**Location of flow past school buildings
(looking downhill towards main road)**

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% flood outlines are similar for the RR area. These appear to be over estimating the risk upstream and to the east of the channel while they appear to underestimate the risk west of the channel (school side).

Minor amendments are proposed and these are indicated on the attached map.

Receptor Comments:

From the site visit, it is thought that the school is the only receptor at risk in this RR area. Properties east of the stream channel are not thought to be low enough to be affected by the River Behy while the property south of the school is well above the level of the stream as shown in the photograph below:

**Evidence of Flooding:**

No evidence of flooding or bank over topping was observed.

Summary:

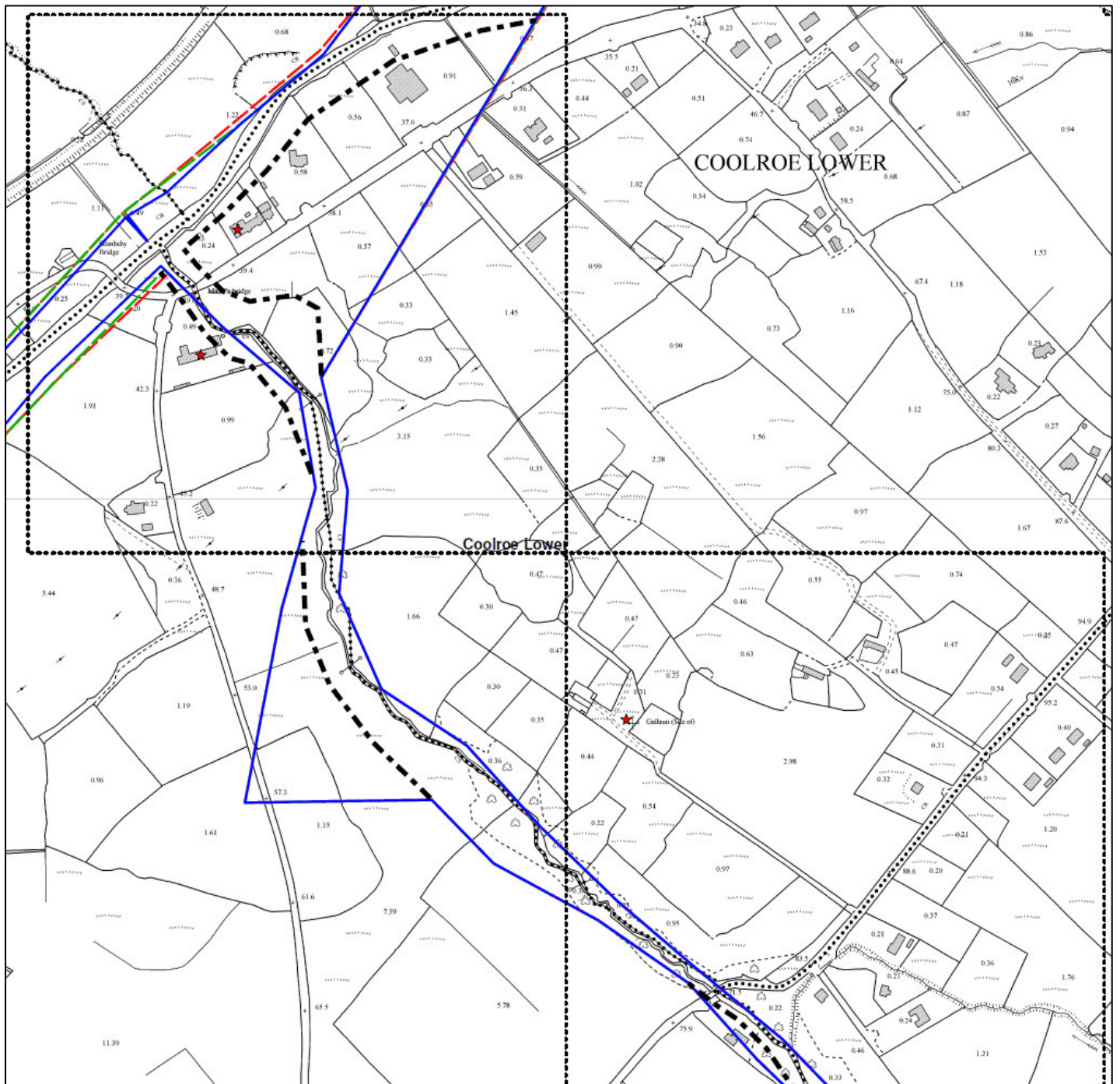
It appears that the model has overestimated the flood risk in this RR area but the school is confirmed as a receptor.

However, since the problem has been identified and confirmed, it is not recommended that further assessment required.

Instead, it is recommended that works are carried out to either improve the stream channel capacity or construct defences to protect the school from future flood events.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Cordal	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220326	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 12/12/2011	
OPW PFRA Comments: None		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> Some flooding has occurred here though not serious. <u>VAL COMMENT - R1:</u> Some minor flooding <u>APP COMMENT R1:</u> Errors in predictive flood extent - Risk Review - Not an APSR		
Floodmaps.ie Information: The website includes some historical information regarding flooding near Tullig. This location is within the ARR (near western boundary), however, the PFRA flood boundaries do not predict flooding here. The website includes an OPW note indicating flood event recorded on 21/11/02 in addition to a database extract indicating the flood location (hand marked OS map) and that flooding is due to water being restricted at the road bridge. The extract also seems to indicate that maintenance works carried out to improve the situation. Various newspaper articles are also included. A recently uploaded LA report also details flooding near to this area (between Castleisland and Cordal ARR's) in August and October 2008 whereby the Glanshearoon River overflowed at a low/weak point near Crag Cave , Castleisland and subsequently entered the Anglore stream via a nearby swallow hole. Culverts along the Anglore Stream were then overwhelmed by the additional flow and flooding occurred at locations outside the ARR from Kilbannivan through Tobermaine towards Tullig which affected several houses and the Cordal Road. Crag Cave - an important local tourist attraction was also		

flooded.

Stakeholder Comments:

Enquiries were made with two people during the survey but neither were aware of flooding problems in the area.

The LA were contacted in relation to flooding in the Cordal and the area engineer and a supervisor advised that some of the smaller drains in this area spilled at times.

They also advised that subsidence/infilling of caves may be affecting underground water routes in this area i.e. water finding alternative flow paths (also mentioned as a possible problem near Castleisland).

The area engineer also advised that the graveyard at Cordal is affected and he thought this may be due to local alterations (unauthorised) to the channel or possibly a build up of gravel/silt.

Shallow flooding of the road at the grave yard was evident during the site visit but appeared to be pluvial in nature. However, in light of the information garnered regarding altered flow paths, this is now uncertain.

Predictive PFRA Flood Outline:

The PRFA predicted fluvial flood outlines in this area are complex due to the convergence of multiple watercourses and drains. Extensive flood areas are indicated where water courses converge even though the watercourses themselves may be quite small.

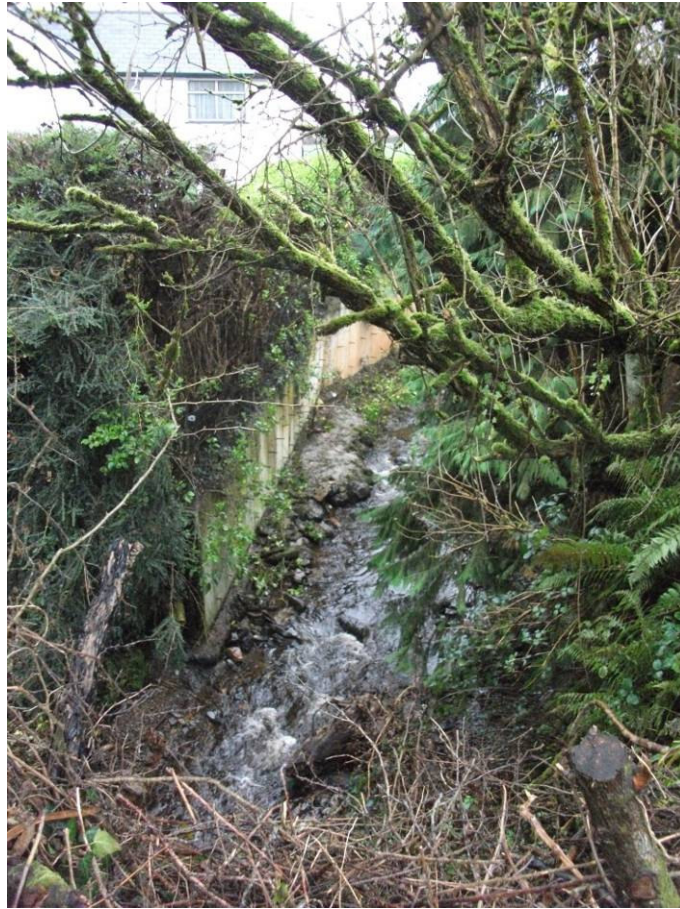
Some of these flood areas are likely to result from model error but it is difficult say for certain and to determine a more accurate boundary estimate (particularly at locations with relatively flat topography and/or multiple minor drainage channels).

As a result, although it is proposed that the outlines are altered to remove unlikely flood plains, the revised outlines must also be treated with an element of caution.

Proposed changes are indicated on the attached map.



Example of minor drain/stream in Cordal RR area



Example of property excluded from Cordal flood risk boundary due to elevation

Receptor Comments:

The revised flood boundaries indicate that the primary school, 32 residential properties and 14 low value monuments will now be excluded from areas of flood risk.

This will result in a significant decrease in the flood risk index from 933 to 223. The revised index is thought to be a more accurate representation of the risk in the review area.

It must also be noted that a conservative approach was taken in relation to some receptors and it may be possible that the risk is marginally lower than this.

Evidence of Flooding:

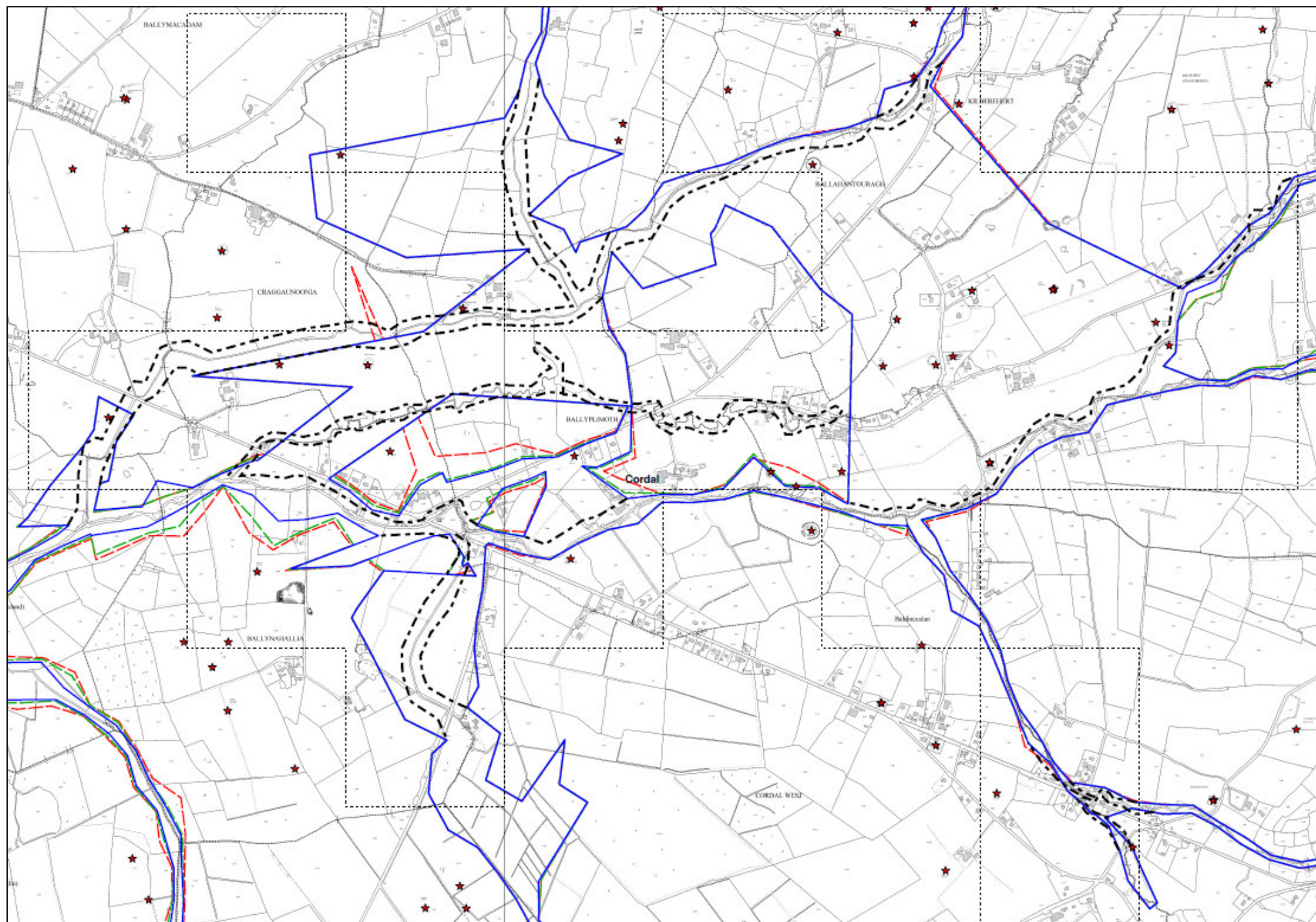
No significant evidence of flooding was encountered. Some high water lines were identified by lodged debris.

Summary:

The site visit has resulted in a significant reduction in the flood risk index and it is thought that further assessment is not required.

Site Visit Findings:

Not AFA.



Revised Flood Boundary -----

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Cromane Lower	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 222594	Site Type: ARR	Source of Flooding: Tidal
Surveyor: David Murphy	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT - R1:</u> R1 Local study for houses at tidal risk <u>APP COMMENT R1:</u> R1 OPW / LA study / minor works - Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> Houses and lands at risk due to tidal flooding at Glasha banks. LA asked it to be included		
Floodmaps.ie Information: A short OPW report is included detailing lands previously protected by embankments which had fallen into disrepair. It is noted that the embankments called "Glassha Banks" were once maintained by the land commission. A second, more recent document summarises the issue in meeting minutes as follows: "‘There are embankments to west of peninsula called Glassha Banks. These embankments used to be maintained but it is thought that the last time any maintenance was carried out was about 20 years ago. The sea breaks through these embankments and floods land behind. This happens at least once per year and is dependent on tides and wind.’" Road to East of peninsula floods on average once per year and is impassable. No houses are affected but some gardens are affected. Cause is tidal and winds.		
Stakeholder Comments: Enquiries were made with two local men and they confirmed that the embankments remain in disrepair but that these were still protecting residential property from wave/overwashing. They advised that properties near		

the embankments came close to flooding (water entered garden – see photo below) a number of years ago when a section of embankment collapsed. This section has since been repaired.



Embankments near properties at risk

They also advised that other properties including a mussel processing plant at the northern tip of the peninsula (see photo below) were not affected by flooding although overwashing onto the road did occur at times.

Piers and Harbour and Area Engineering staff of Kerry County Council were contacted in relation to flooding in the Cromane area and they were able to advise as follows:

There are essentially two locations of concern in this area – the low lying areas at the northern tip of Cromane Lower (where the last residential houses are) and the south east corner where the “Glasha Banks” are located (near Knockaunnaglashy townland). The approximate line and location of these embankments is shown in the map below.

The embankments at the northern tip were once the responsibility of the land commission but these are no longer managed by a public body and are now in disrepair and largely ineffective. Staff advised that sea water enters from breaches in these embankments and although lands are affected, they were unaware of any houses having flooded to date. Staff also agreed that the mussel processing plant was likely to be at significant risk as it is unprotected.

They also advised that the possibility of building a new pier at this location had

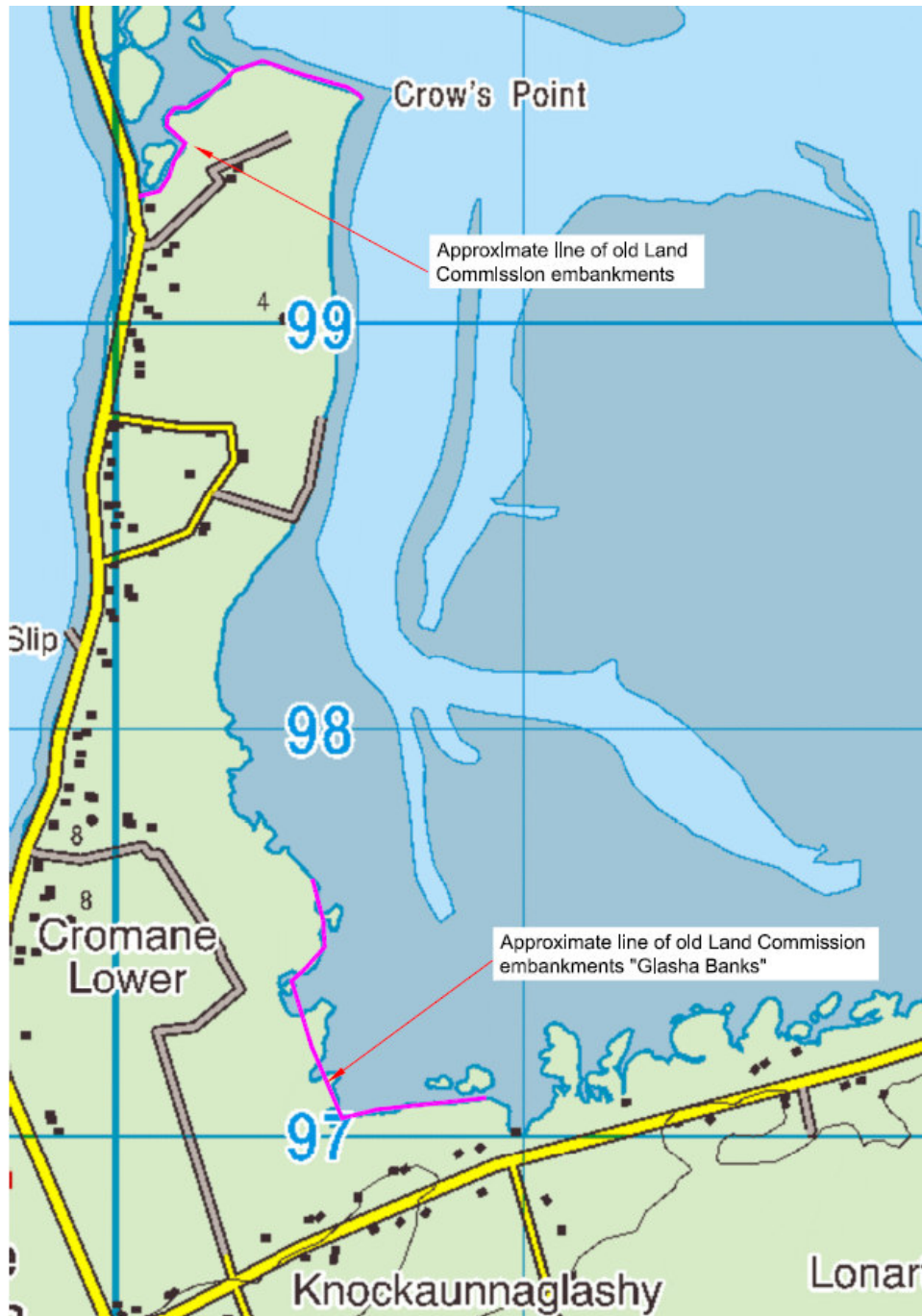
been under consideration but plans for this had now been put on hold indefinitely.

With regard to the Glasha Banks, the LA advised the main purpose of these was to protect agricultural lands but that due to lack of maintenance and possibly to rising sea levels, these were no longer effective and the lands were no longer protected. The LA agreed that in general, most houses in the Cromane Lower area are high enough that they are not at significant risk of flooding although the access road may be affected at times due to overwashing.

The LA are concerned that the flood defences are no longer anyone's direct responsibility since the Land Commission ceased to operate and as a result, the defences are likely to continue to deteriorate as maintenance is only carried out in a reactive fashion or in some cases, not carried out at all.



Processing plant at northern tip of peninsula



Approximate location and line of old Land Commission Embankments at Cromane

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% flood outlines are broadly similar for the ARR and from on site assessment, these appear to be consistent with the topography of the land. The outlines do not follow the line of the land commission embankments and would therefore appear not to consider these as effective defences.

The flood boundaries do indicate some properties at risk in the area where the

two local men said the embankment had previously been breached. No changes are proposed to the flood risk boundaries and the map is included for reference with this report.

Receptor Comments:

From the site visit, it is evident that the majority of houses in the area are high enough that they will not be affected by extreme tides and that historical flood problems largely relate to agricultural lands.

It would appear that the processing plant is located in an area of flood risk.

Evidence of Flooding:

No evidence of flooding or bank over topping was observed. High water marks were not evident beyond the low shore walls and embankments.

Summary:

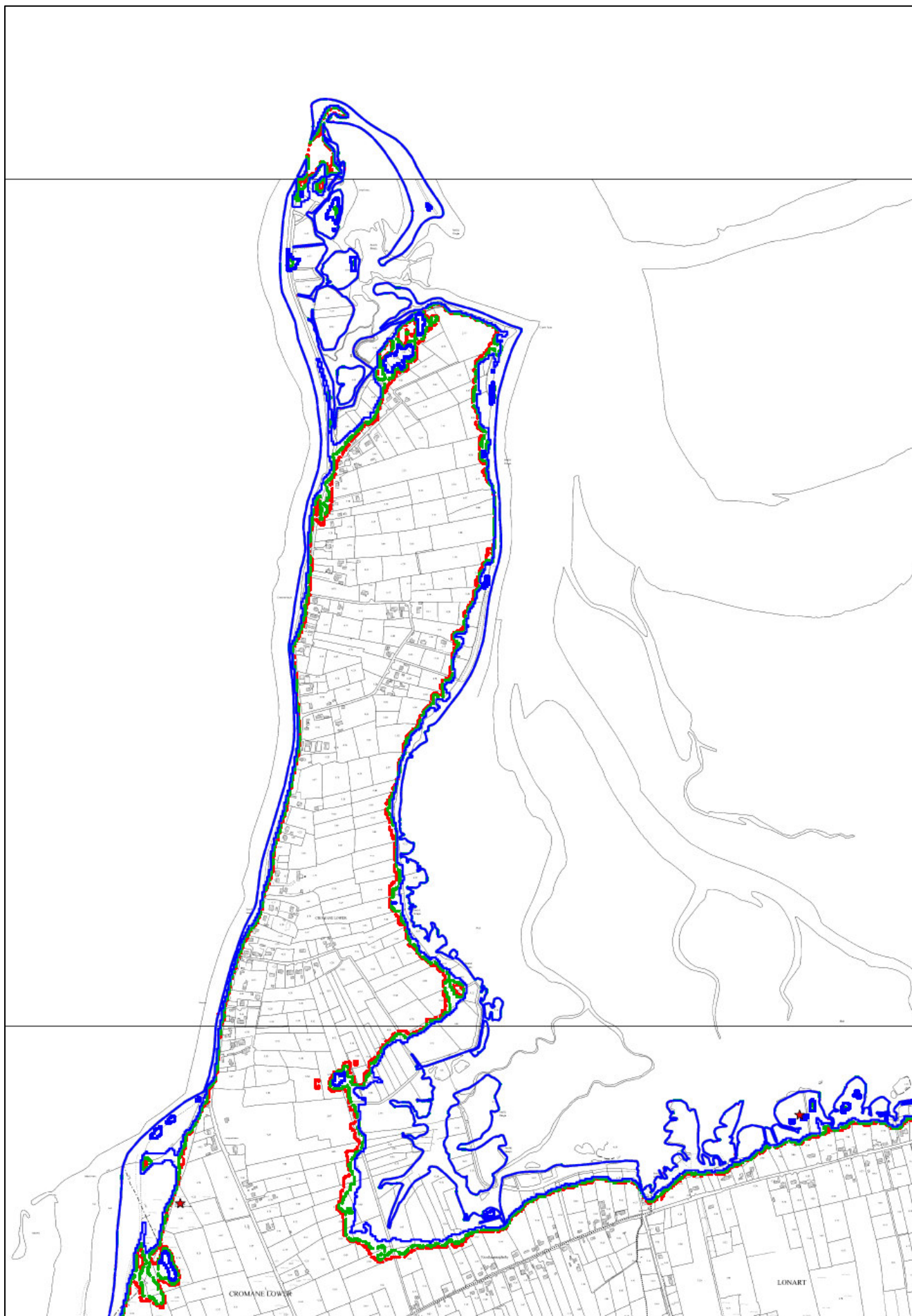
It appears that a small number of properties, the processing plant and some agricultural land are at risk of flooding due to high tide.

However, since the problem has been identified and confirmed, it is not recommended that further assessment is required.

Instead, it is recommended that works are carried out to rehabilitate and/or improve the existing defences and to construct new defences where none exist in order to reduce the risk from possible future flood events.

Site Visit Findings:

Not AFA.



Tidal flood boundary (No changes proposed)

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Curreal	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 222595	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 13/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> 'Flood Hazard mapping website have two events (Aug 1986 and Nov 1980). Bridge downstream of Glenflesk mentioned in OPW memo. See Ref: 225502, Repeat <u>APP COMMENT – R1</u> Duplicate From Glenflesk – “Reports of Flooding – Risk Review – Not an APSR”		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contains a number of documents including correspondence, newspaper clippings and reports. However, the majority of these documents are unrelated or non specific to the site inspection areas. A number of the documents are general reporting on Hurricane Charlie.		
Stakeholder Comments: KCC provided a report on Glenflesk which is within the same inspection area as Curreal (Glenflesk Flood Relief Pre-feasibility Study). KCC raised a number of issues in relation to flooding of roads including the National Primary Road (N22) and regional roads which resulted in restricted access to a number of properties.		
Predictive PFRA Flood Outline: There is no PFRA boundary for the area or FRI score information available for Curreal (or Glenflesk) from the PFRA stage,. However, a separate boundary		

area was provided and the site inspection focused on the flood risk outlines within this boundary which included Curreal and Glenflesk.

Overall, the predicted 10%, 1% and 0.1% AEP fluvial outlines appear reasonable with no major anomalies. However, there is a negative wedge in the 10% AEP fluvial outline to the north west of Curreal and Glenflesk. Based on the site visit this outline has been modified to align with the 1% and 0.1% AEP outlines. The river bank and topography of the surrounding area to the north of the river is very flat and is approximately 1m lower than the southern bank. This is reflected in the large spread of the flood extents to the north.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Curreal

Receptor Comments:

As mentioned above, there is no FRI score available for Curreal (or Glenflesk) from the PFRA. However, based on the site visit and the modified flood outlines there are approximately 14 residential / commercial properties (2 of which are derelict) within the flood risk outlines. This would result in a maximum FRI score of 140 which is well below the threshold score.

It should also be noted that this includes a number of houses which may be designated as being within the Glenflesk catchment.

Evidence of Flooding:

During the site visit there were no visible signs of flooding within the area. Local residents advised of significant flooding during the early 1980's which resulted in a number of houses and the local GAA pitch being flooded.

Glenflesk Flood Relief Pre-Feasibility Study

The report provides historical evidence of flooding between Glenflesk Bridge and Loo Bridge (Derreenacullig) which resulted in the flooding 23 houses, 3009 acres, the loss of 209 livestock, and 322 road access disruptions.

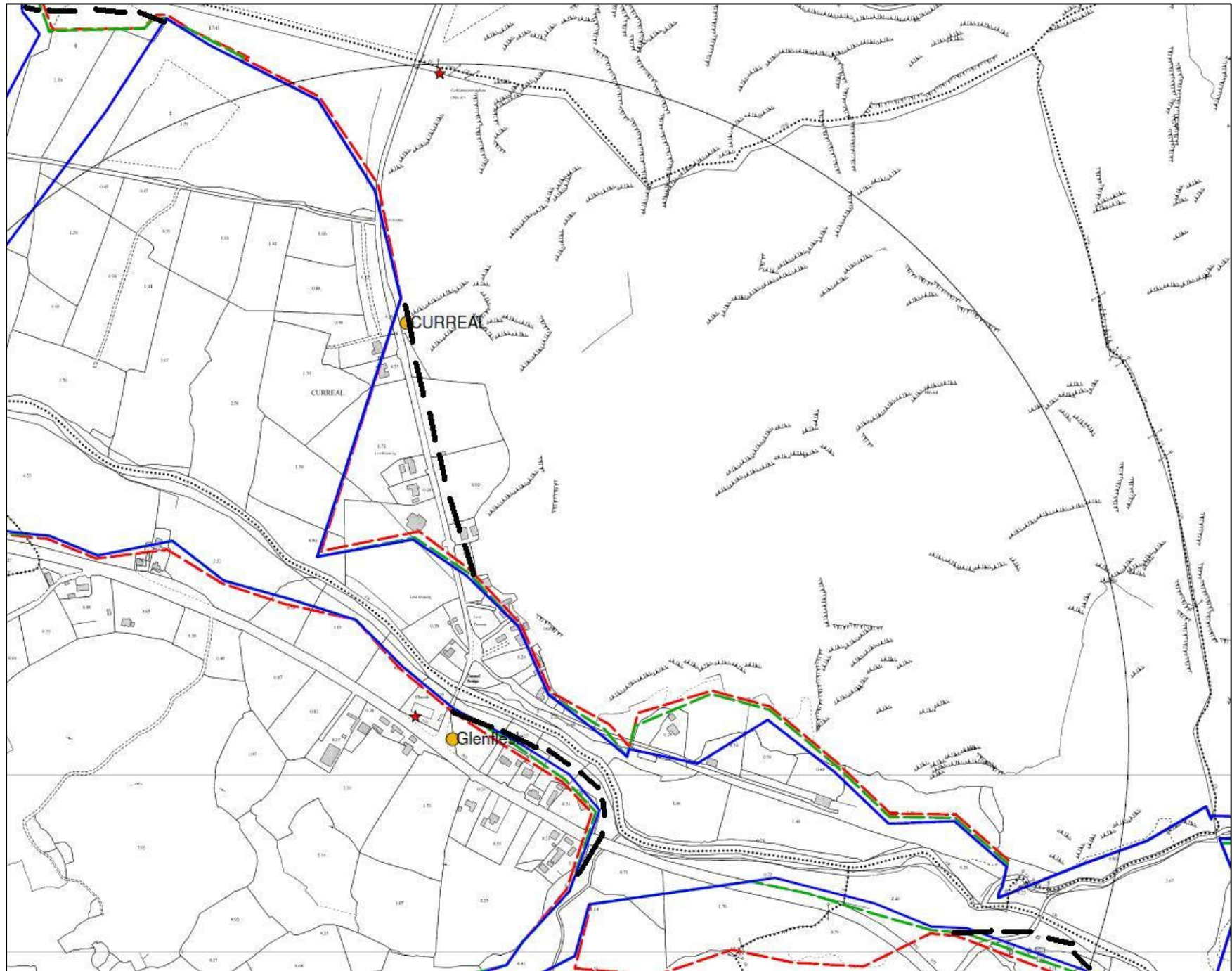
The extent of this area is well beyond that of the site inspection boundary and is likely that 14 of the 23 receptors are from the Curreal / Glenflesk area. However, even allowing the 23 properties, this would not provide a FRI score higher than the threshold.

Summary:

The area of inspection was the flood risk outlines within the boundary area provided which included Glenflesk. The site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Derreenacullig	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 222596	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 13/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> No clear reason for inclusion of this location. Flood hazard mapping Website two events - flooding of R569 at Loo Bridge every two years - not an APSR <u>APP COMMENT – R1</u> Risk Review – Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contains 2 documents under Derreenacullig. However, these do not appear to be directly related to the site inspection area. One of the documents is correspondence and the other is minutes of a meeting between KCC and the ESBI. The minutes relate to data collection as part of the OPW Flood Hazard Mapping project. The minutes list 5 number flood events. The following excerpt from the minutes details a flood event of the R569 which passes through Derreenacullig: <u>“Item 2</u> <u>Poulgorm Bridge (Flood ID – 4677)</u> 300m to 400m of the R569 roadway was washed away during flood of August 1986. This was an exceptional flood. Following the flood the River was cleaned and deepened and the road was replaced. Problem has not recurred. <u>River Flesk on L7059 Recurring (Flood ID 4727)</u> The L7059 – Foiladuane Road near junction with the R569 is flooded on average once every two years resulting in road being closed for a day or so.		

Cause is heavy rainfall/runoff resulting in Flesk overflowing its banks and upland high velocities.”

Stakeholder Comments:

KCC raised a number of issues in relation to flooding of roads including the National Primary Road (N22) and regional roads which resulted in restricted access to a number of properties.

Predictive PFRA Flood Outline:

There is no PFRA boundary for the area or FRI score information available for Derreenacullig. There is also no Local Authority Development Boundary available. Therefore, the site inspection focused on the flood risk outlines within the townland of Derreenacullig.

Overall, the predicted 10%, 1% and 0.1% AEP fluvial outlines are reasonable. However, there is one location where the 10% AEP outline crosses the 1% AEP outline.

Due to the topography, route of the river and access restrictions the sections of the flood outlines could not be visually inspected or verified on site.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Derreenacullig

Receptor Comments:

As mentioned above, there is no FRI score available for Derreenacullig from the PFRA. However, based on the site visit and the flood outlines there is only 1 property within the flood risk outlines. This would result in a maximum FRI score of 10 which is well below the threshold score.

Evidence of Flooding:

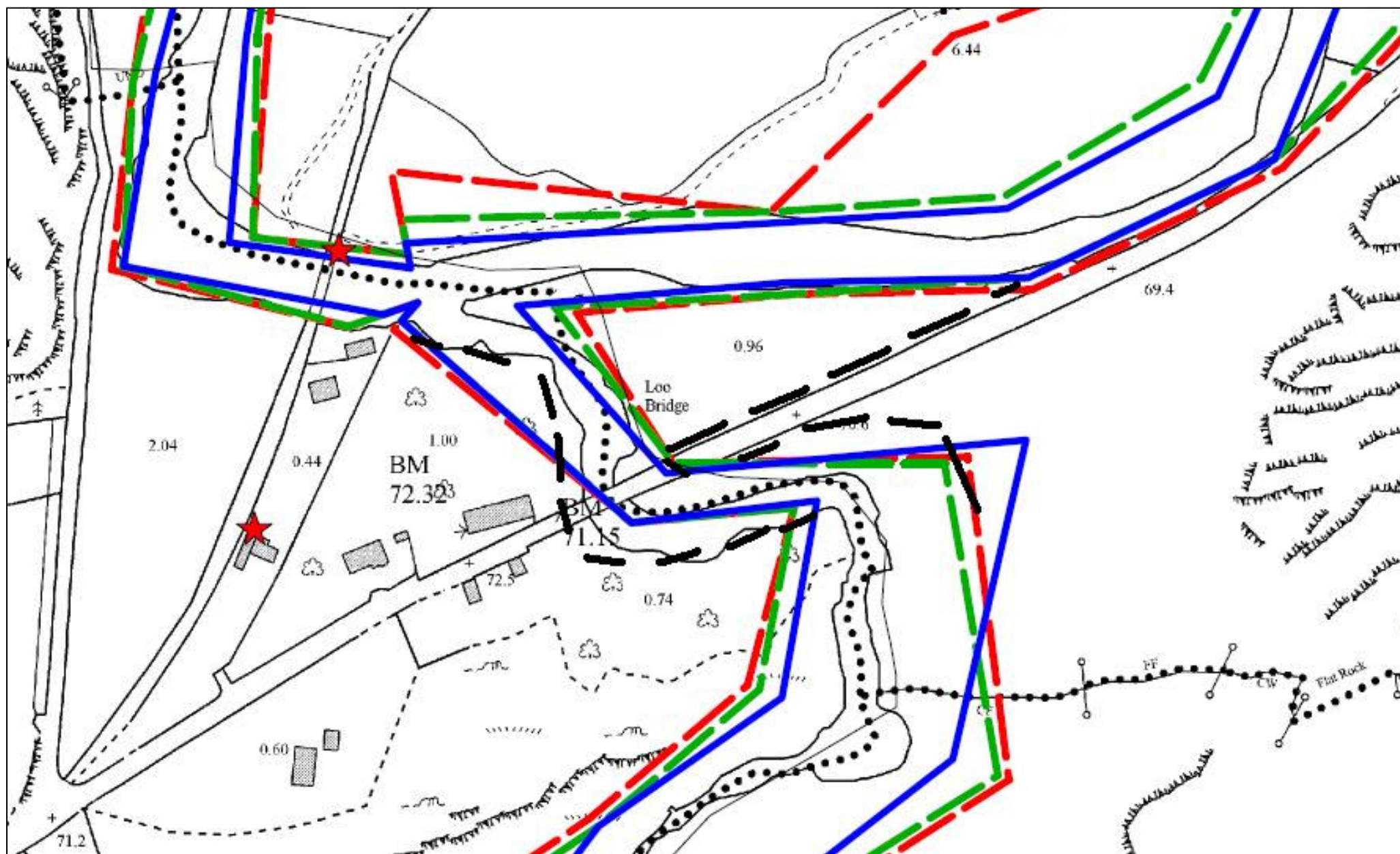
During the site visit there were no visible signs of flooding within the area.

Summary:

No boundary information is available for Derreenacullig from the PFRA stage. The Local Authority Development Boundary was also unavailable. Therefore, the area of inspection was the flood risk outlines within the townland of Derreenacullig. Due to the topography, route of the river and access restrictions the sections of the flood outlines could not be visually inspected or verified on site. However, there is only 1 property within the flood outlines. The site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Dingle	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220327	Site Type: CAR	Source of Flooding: Fluvial & Tidal
Surveyor: David Murphy	Date: 08/12/2011	
OPW PFRA Comments: None.		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> None <u>VAL COMMENT - R1:</u> High FRI Score <u>APP COMMENT R1:</u> Approved - APSR		
Floodmaps.ie Information: Three recurring flood events are recorded for the Dingle harbour area in the minutes of a meeting with Kerry County Council held in 2005: <u>The Wood (Flood ID 3619):</u> Flooding occurs at The Wood between Milltown Roundabout and Strand Street on the R559. The cause is tidal. Historically, flooding has occurred once or twice a year rendering the road impassable. The road was raised in February/March 2005. Problem has not been eliminated completely but it is hoped that it will be possible to keep road passable at all times. The raised road is super-elevated so that at worst it is anticipated that one lane will be passable at all times. <u>The Mall (Flood ID 3620):</u> The Mall Roundabout on the N86 is flooded on average once every 5 years. Road is rendered impassable. Cause is heavy rainfall/ runoff combined with high tide. When road is impassable there is no alternative route available to traffic entering/ leaving Dingle using the N86. Last occurrence was two years ago. No houses affected. For The Mall, there is also an extract from an OPW report relating to a flood		

event in January 1988. Although the flooding was attributed to surcharging of the sewer system, it is outlined that the stream, the drainage system and the tidal outfall are likely to be interdependent. The report outlines estimated flows and expected high and low tide levels. Photos for this event are also included on the website.

Stakeholder Comments:

A number of local people were consulted about flooding during the survey and in general, the reports received were in line with the information on the flood maps website i.e. flooding near the culverted stream along The Mall (reports often unclear whether problem is fluvial or pluvial) and flooding due to high tides.

One local advised that the quay walls had once been badly damaged by high tides and when they were re-built, they were raised to a higher level and this reduced the problem. He was of the opinion that the flooding was due to overtopping due to wave action rather than tide levels in excess of defences.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

Fluvial:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis.

In general, it is difficult to say how accurate the flood extent outlines are, mainly due to heavy modification of the stream channel: many sections are open with no protection while others have ~1.5m high walls or are closed culverts below buildings.

Comparison of the PFRA flood extent outlines with the topography observed on site has resulted in some minor changes to the flood outlines as indicated on the map included in the Appendix to this Site Inspection Report.

Tidal:

The 10%, 1% and 0.1% AEP outlines used in the PFRA analysis vary notably except where there is a significant near-vertical increase in ground level e.g. quay walls. The flood extents appear to agree with variations in ground levels observed on site and only one minor change is proposed.

General:

For both sources of flooding it should be noted that the outlines are likely to vary significantly due to aspects not fully accounted for by the PFRA model e.g. gaps in quay defences and walled channels and the likely flow paths through and around these, particularly at The Mall due to the sloped topography.



Building over culverted stream along The Mall in Dingle



Photo indicating higher level of quay area (RHS) compared to street level (towards LHS)

Receptor Comments:

It is estimated that approximately 25 commercial/residential properties could be removed from the FRI score due to the revised 10% AEP fluvial flood extent outline.



Example of building excluded from flood risk boundary due to elevation

However, there are a number of new commercial and residential properties which may need to be added. Minor differences between mapped buildings and those observed on site mean it is sometimes unclear if all have been accounted for.



Example of new buildings (LHS) adjacent to water course

In addition, a single residential building can be removed from the 1% and 0.1% tidal outlines.

Removal of these properties will not significantly alter the total FRI score for the Dingle review area.

Evidence of Flooding:

No evidence of flooding noted. High water marks are evident for much of the quay area as shown on the attached photos but these appear to be indicative of normal high tides as opposed to extreme tide events.



High water marks evident near harbour area

As discussed in the stakeholder comments section, the quay/car park walls appear to act as defences against high tides.

Flap valves are evident in the stream outlet channel from The Mall.

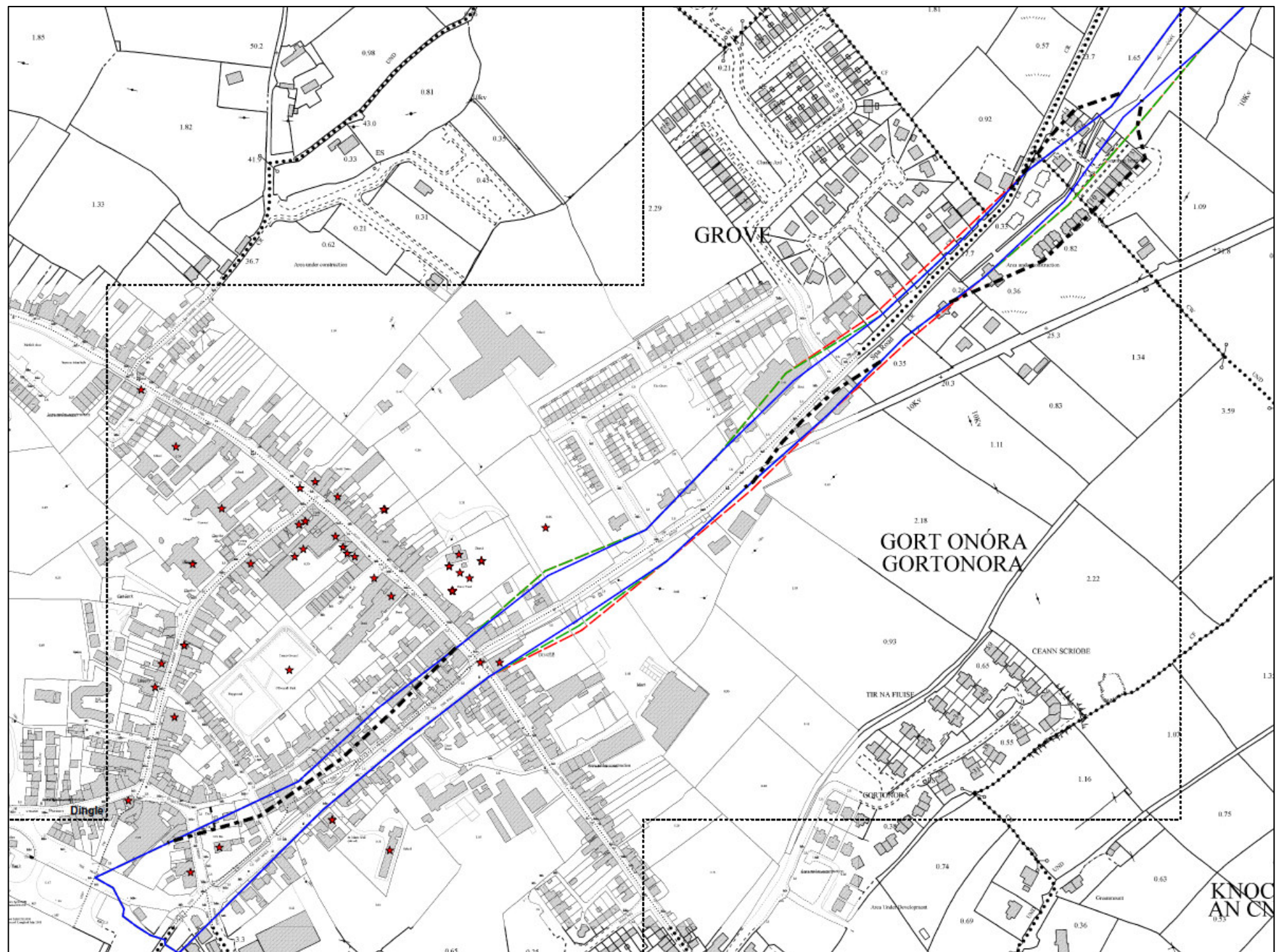
Summary:

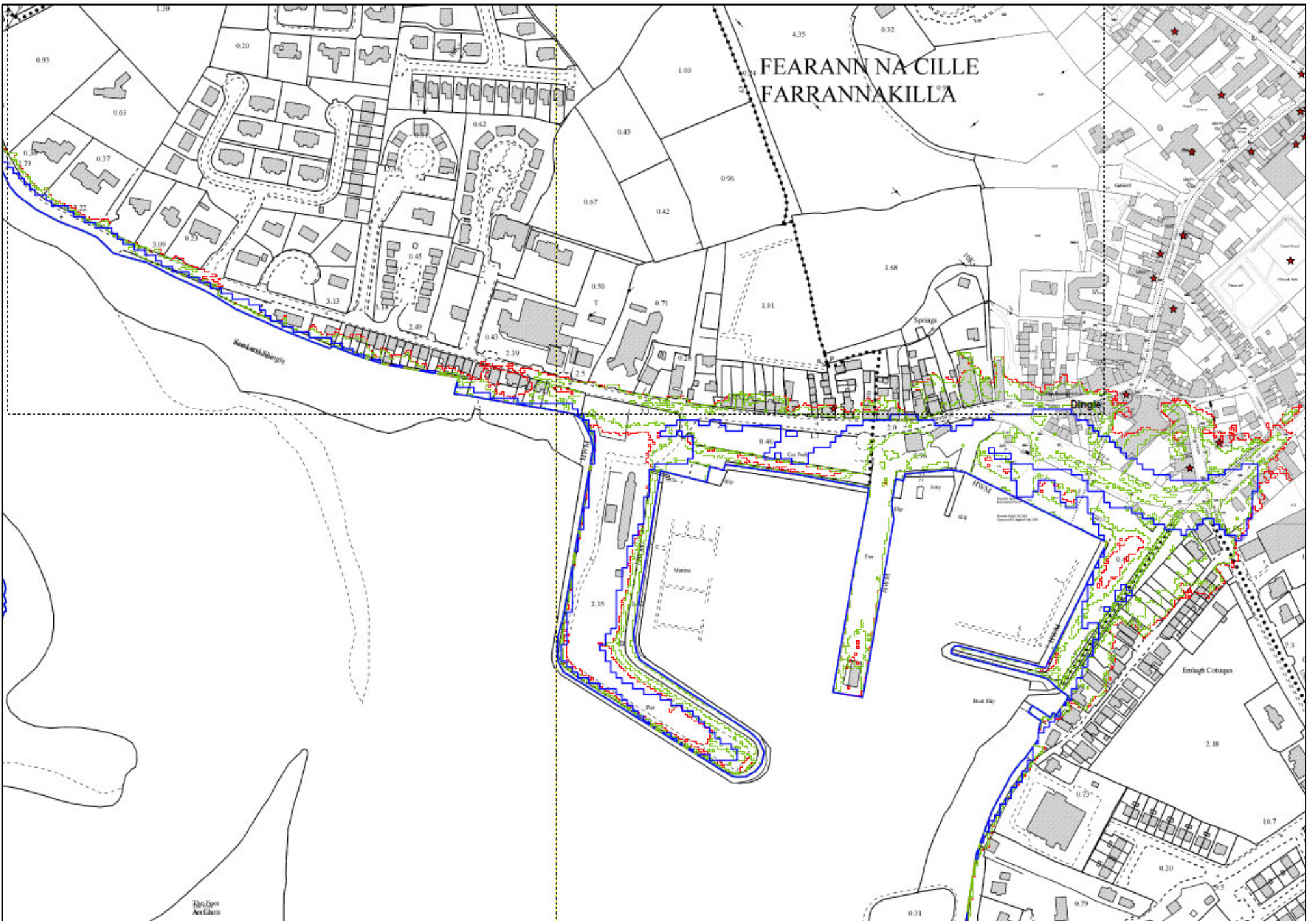
The dingle review area is very complex due to the combination of tidal and fluvial sources in addition to variations in defences and channel cross sections and the sea-ward sloping topography.

Although the FRI score will be somewhat reduced as a result of the revised flood outlines, the residual risk to the area is significant and further assessment is warranted.

Site Visit Findings:

AFA.





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Dromanallig	Hydrometric Area: 19	County: Cork
Unique OPW ID: 192424	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 14/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> No LA feedback, Not on Predictive, FHMDB , OPW Regional records <u>APP COMMENT – R1</u> Risk Review – Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contained no information in relation to flooding at Dromanallig. (Information is available for flood events at Ballingeary).		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: There is no PFRA boundary or FRI score available for this area. A separate boundary area was provided and the site inspection focused on the flood risk outlines within this boundary. The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar with slight variations in the extents at some locations. At one point the 10% AEP outline exceeds the 1% outline. There also appears to be some minor alignment issues between the river centre line and the flood outlines. Based on the site visit the PFRA fluvial outlines in this area have been amended		

as shown in the map attached to this Site Inspection Report.



Dromanallig

Receptor Comments:

As mentioned above, there is no FRI score available for Dromanallig from the PFRA. Based on the site visit, no receptors were identified within the flood risk outlines. Therefore, the site is not an AFA.

Evidence of Flooding:

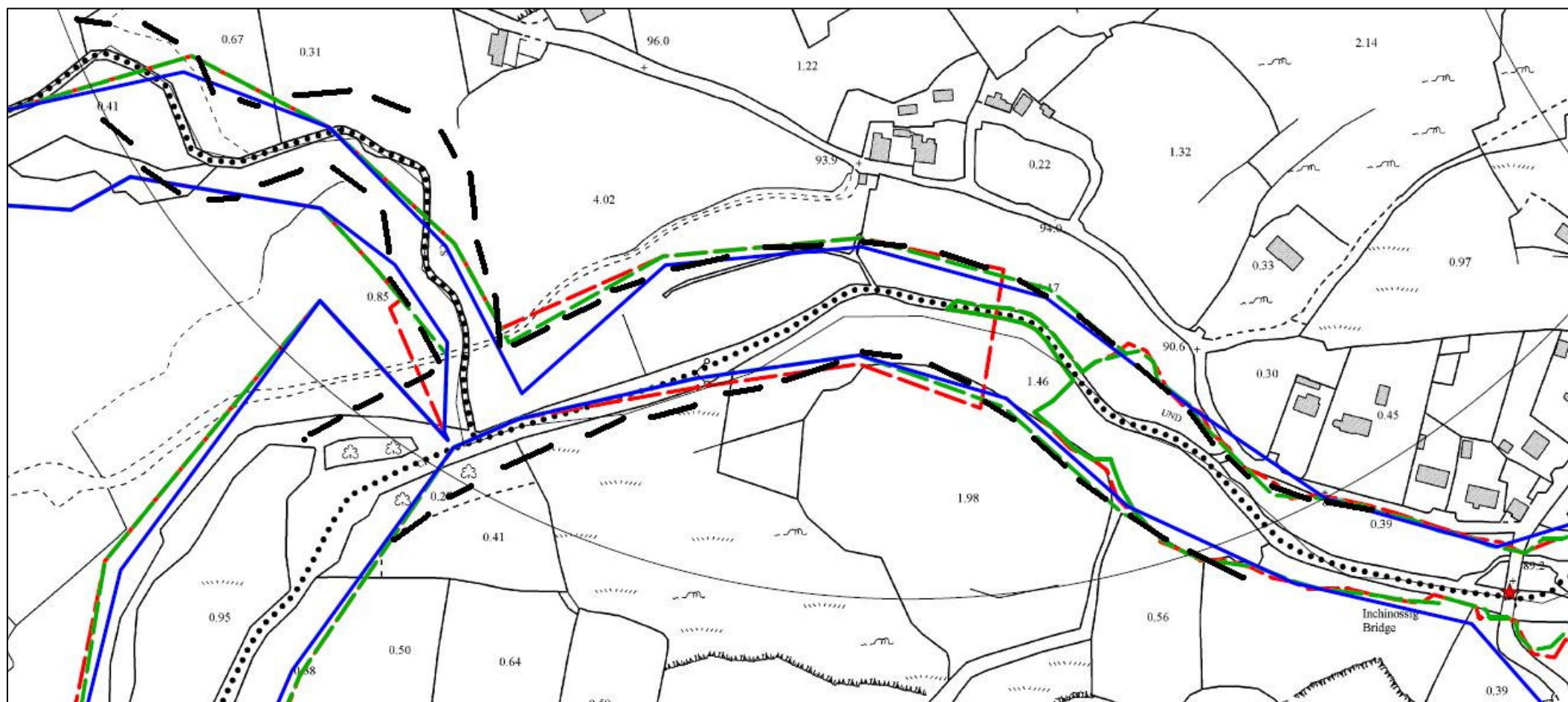
During the site visit there were no visible signs of flooding within the area.

Summary:

The fluvial flood risk outlines have been modified. No receptors have been identified within the flood risk outlines. Therefore, the site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Dromore	Hydrometric Area: 20	County: Cork
Unique OPW ID: 200297	Site Type: IRR for RR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 15/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> High score due to school , No LA feedback <u>APP COMMENT – R1</u> Isolated school at risk - Risk Review and possible minor works - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R2</u> Primary school in flood zone driving up flood index. Check what records of previous flood events. Has the school been affected by flooding?		
Floodmaps.ie Information: The website contained no information in relation to flooding at Dromore.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar with only slight variations in the extents at some locations. There also appears to be some minor alignment issues between the river centre line and the flood outlines. From the site visit it is clear that the flood extents are restricted by the topography of the surrounding lands resulting in similar extents for the 10% AEP, 1% AEP and 0.1% AEP. The majority of the watercourses within the APSR boundary have high banks (i.e. river flowing west to east at the south of the APSR boundary) or steep slopes (i.e. river flowing from the north west). The		

flood risk outlines have been modified to reflect the topography and address alignment issues.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Dromore – River is under the hedging in the foreground and follows the line of the ditch. School can be seen in the background.



Dromore – view of River downstream from School

Receptor Comments:

The initial FRI score for Dromore was 310 which included the Primary School, a low value monument and 5 residential / commercial properties.

Following the site visit and the modifications to the flood risk outlines, the Primary School and 4 residential properties are deemed to be at risk. However, based on the topography, and the modifications and re-alignments to the flood extents the Primary School is deemed to be within the 1% AEP flood outline. The residential properties are located close to the river banks and therefore within the 10% AEP flood outline.

No monuments were identified within the flood extents during the site visit.

Based on the above the revised FRI score for Dromore is 65 which is below the threshold score. Therefore, the site is not an AFA.

Evidence of Flooding:

During the site visit there were no visible signs of flooding within the area.

The Principal at the local Primary School advised that they have experienced no flooding during the past 7 years of her tenure and have no records of any events prior to this.

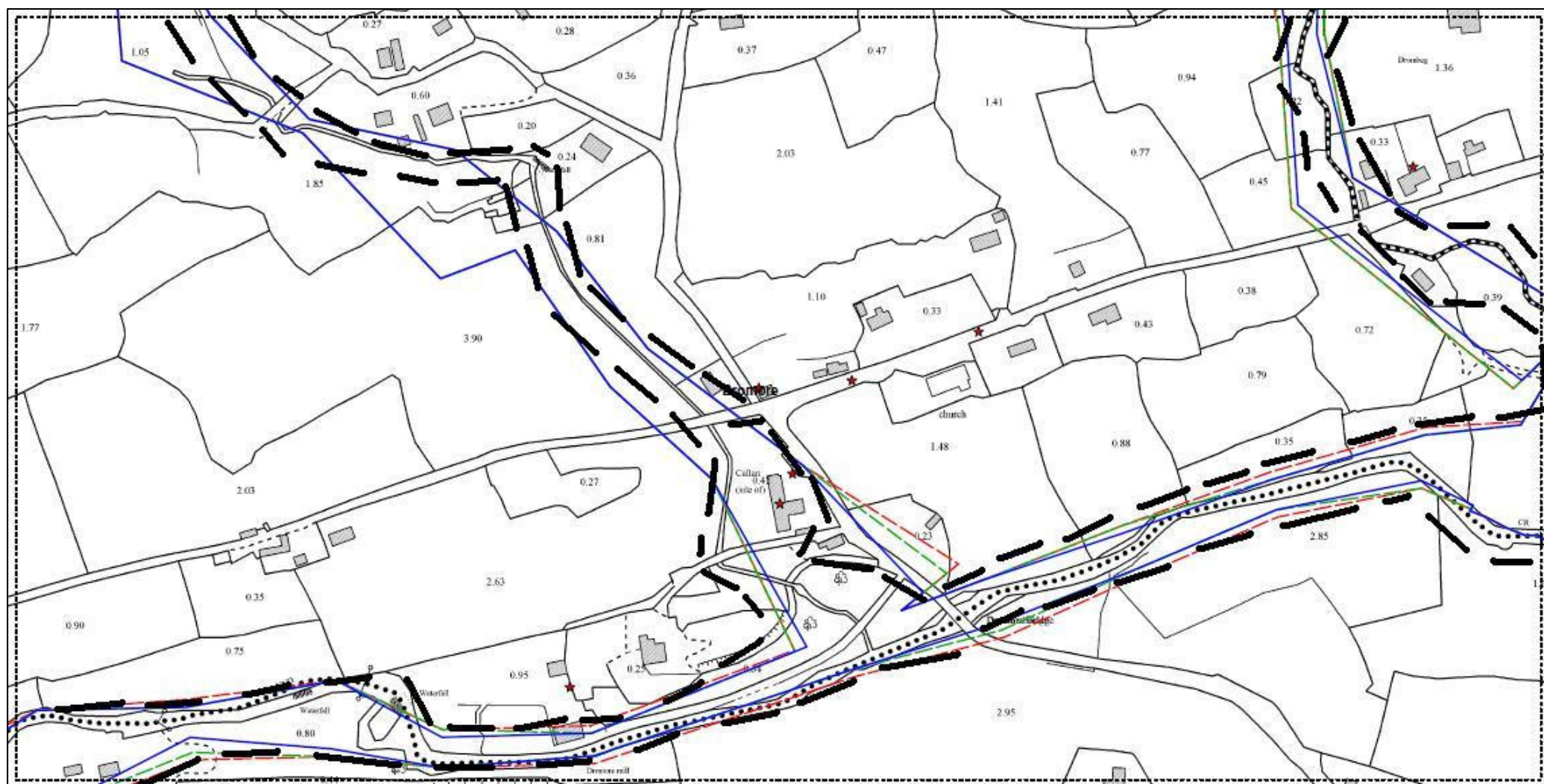
One local resident whose property is within the 10% AEP advised that his property flooded 2 years ago. However, the resident advised that no other properties flooded during this event and that they believe the cause of the flooding was due to blockages at the culvert / bridge on the edge of their property.

Summary:

The fluvial flood risk outlines have been modified. 4 residential / commercial properties are deemed to be at risk within the 10% AEP flood outline. A Primary School is also deemed to be at risk within the 1% AEP. The revised FRI score of 65 is below the threshold score. Therefore, the site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Dunderrow	Hydrometric Area: 20	County: Cork.
Unique OPW ID: 200296	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 8/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> No LA feedback, Not on FHMDB or OPW Regional records <u>VAL COMMENT – R2</u> LA requested RR to be considered. <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R2</u> Score is close and LAP Extent Maps indicates a risk.		
Floodmaps.ie Information: No flood events recorded on the website.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The 10%, 1% and 0.1% AEP flood extent outlines from the PFRA analysis are coincident. From the site visit it would appear that the river flood outline on the south side of the village are over estimated. Based on the topography in the village and the size of small stream, the flood extent outlines have been amended. Refer to drawing attached.		
Receptor Comments: The amendment of the flood extent outlines has confirmed the removal of 18		

Residential properties from the flood extent area. This leads a reduction of 180 from the total FRI score. This reduces the FRI score from 220 to 60.

Evidence of Flooding:

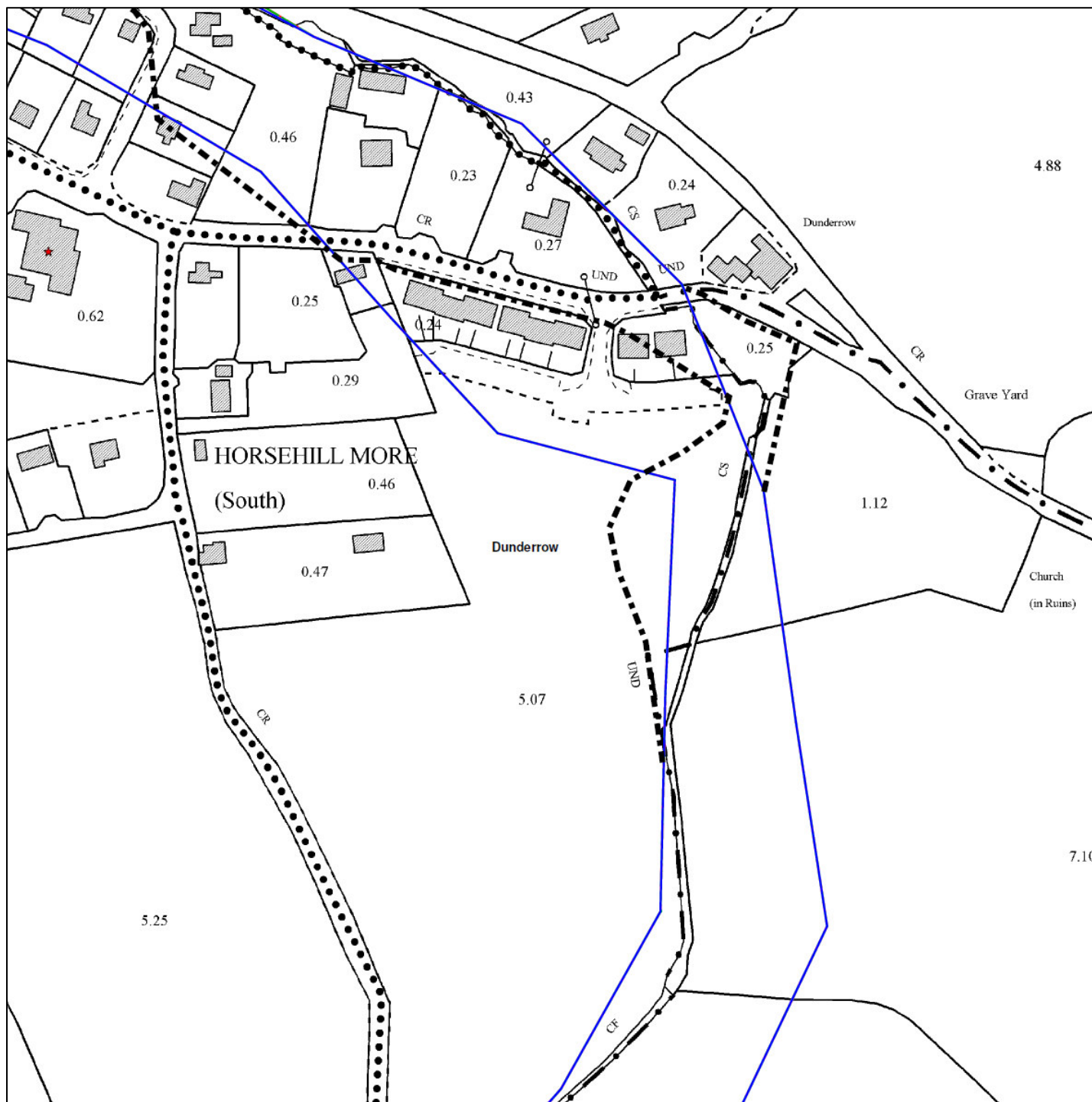
No evidence of flood damage was noted during the site visit, but the long straight Bradfields Road that runs downhill through the village may be susceptible to pluvial flooding. The drainage gullies on this road appear to be blocked and numbers of gullies on the road appear to be inadequate as a lot of new houses have been built up the hill along the road. Bank erosion was noted at the inside of the bend in the stream east of the village.

Summary:

This site is not an AFA because only 6 residential receptors are at risk from flooding and flooding is mainly due to pluvial flow on the Bradfield Road.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Dunmanway	Hydrometric Area: 20	County: Cork
Unique OPW ID: 200297	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 16/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> Scheme 2000 / 2001 no flooding since (pd), FRS. Scheme on-site. Schemes at detailed design <u>VAL COMMENT – R1</u> In an APSR, High FRI Score - Local Authority Concerns <u>APP COMMENT – R1</u> Approved - APSR – FRS		
LA Feedback Comments: <u>LA COMMENT – R1</u> Big score because of the Fire Station. To be checked. November 09 flooding caused problems at East. Surface water and small lake flooding. Blocked regional road and residential properties flooded at edge of town <u>LA COMMENT – R2</u> Fluvial and pluvial flooding		
Floodmaps.ie Information: The website contains a number of files including newspaper clipping, photographs, maps and reports. Documents include: <ul style="list-style-type: none"> • Coillte Maps & GIS Section – Maps • Extract from Bandon River (Dunmanway) Drainage Scheme – EIS – includes photographs and extent map of flooding • Dunmanway Flood Alleviation Scheme – OPW Report (1991) • Dunmanway Flood Relief Scheme – Draft Interim Report <p>It should be noted that a number of the reports, photographs etc. identified flooding in the vicinity of Dunmanway Lake which is not included in the flood extents provided.</p>		

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

Overall the predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar. However, there are a number of wedges into the flood outlines. There is also one point where the 10% AEP exceeds the 1% AEP and 0.1% AEP outlines.

From the site visit the fluvial flood risk outlines have been modified to reflect the topography.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Dunmanway



Dunmanway – river running adjacent to properties

Receptor Comments:

The initial FRI score for Dunmanway was 363.1. The main contributor to this score was the Fire Station within the 10% AEP fluvial flood risk outline (250 points). Following the site visit the Fire Station is confirmed as being within the 10% AEP flood risk outline.

Based on the site visit the flood risk outlines were modified. This resulted in the inclusion of an additional 10 residential / commercial properties within the 10% AEP outline.

Evidence of Flooding:

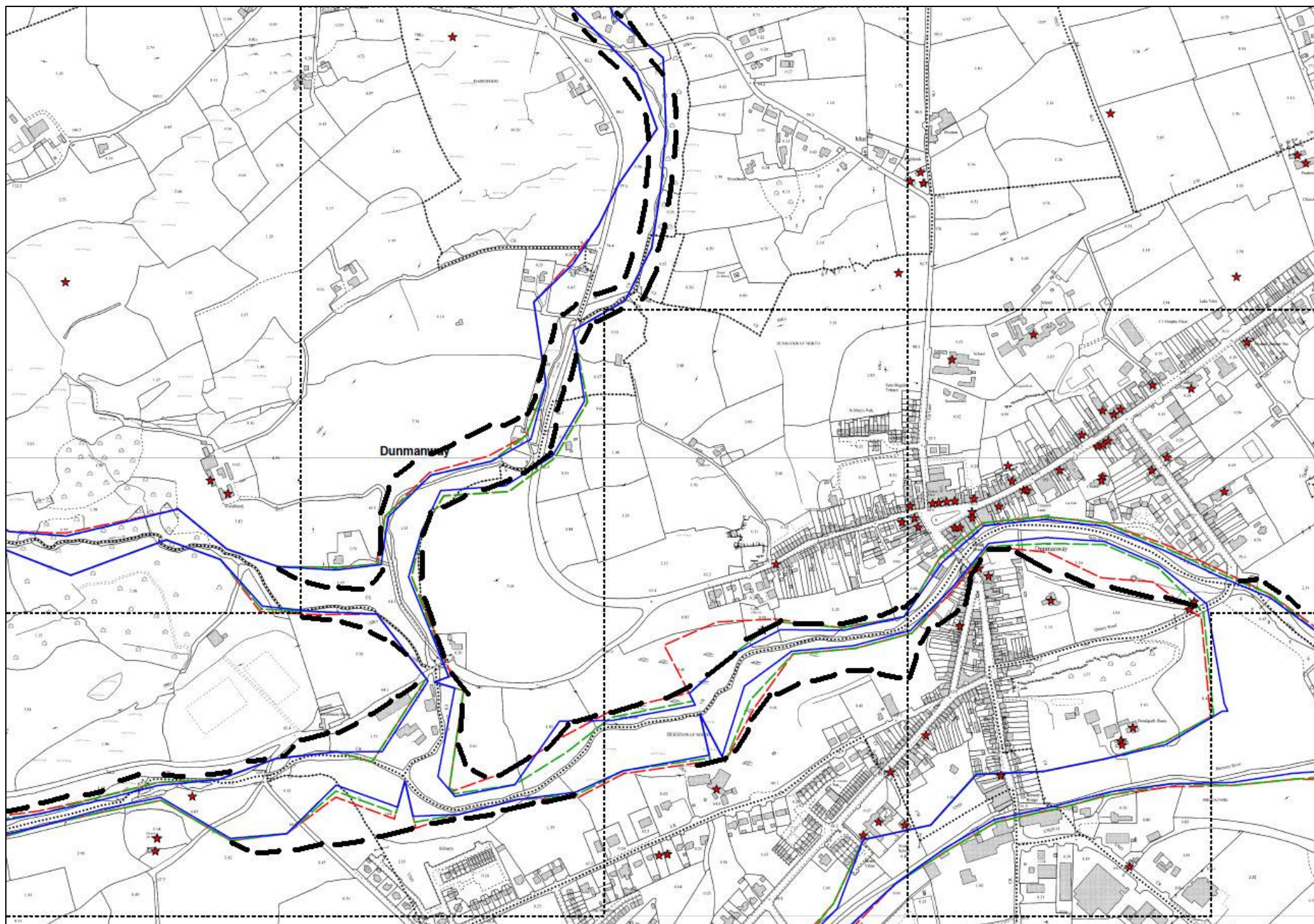
During the site visit there was no evidence of flooding.

Summary:

The initial FRI score for Dunmanway was 363.1 which is above the threshold score. Based on the site visit the fluvial flood risk outlines were modified and the Fire Station was confirmed as being within the 10% AEP outline. Furthermore, an additional 10 residential / commercial properties were identified as being within the 10% AEP outline. The revised FRI score is 463.1. Therefore, the site is an AFA.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Durrus	Hydrometric Area: 20	County: Cork
Unique OPW ID: 210309	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 15/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> New Housing estate flooding - LA Severity = 0 <u>APP COMMENT – R1</u> Approved APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Residential flooding, not on Main street but on (new) housing estate <u>LA COMMENT – R2</u> Fluvial flooding only		
Floodmaps.ie Information: The website does not contain any documents in relation to flooding in Durrus.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: Overall the 10%, 1% and 0.1% AEP fluvial outlines appear reasonable. However, there are a number of points where the 10% AEP exceeds the 1% AEP and 0.1% AEP flood outlines. There also appears to be some minor alignment issues between the river centre line and the flood outlines. The flood risk outlines have been modified to reflect the above which has resulted in the inclusion and removal of a number of receptors. Based on the site visit the PFRA fluvial outlines in this area have been amended		

as shown in the map attached to this Site Inspection Report.



Durrus – Unknown receptor (Primary School) within the flood outline.



Durrus – new development susceptible to flooding.

Receptor Comments:

The site visit identified a Primary School and a WWTP which were located within the flood risk outlines but were not included in the FRI score. The Primary School was within the predicted 1% AEP outline. However, following the modifications to the flood risk outline it is now within the 10% AEP along with the WWTP.

The initial FRI score for Durrus was 390, which is above the threshold score. Following the site visit and the modifications to the flood risk outlines the FRI score has been revised to 565. This score is based on 31 residential / commercial properties, 1 Primary School and 1 WWTP being located within the 10% AEP fluvial outline.

Evidence of Flooding:

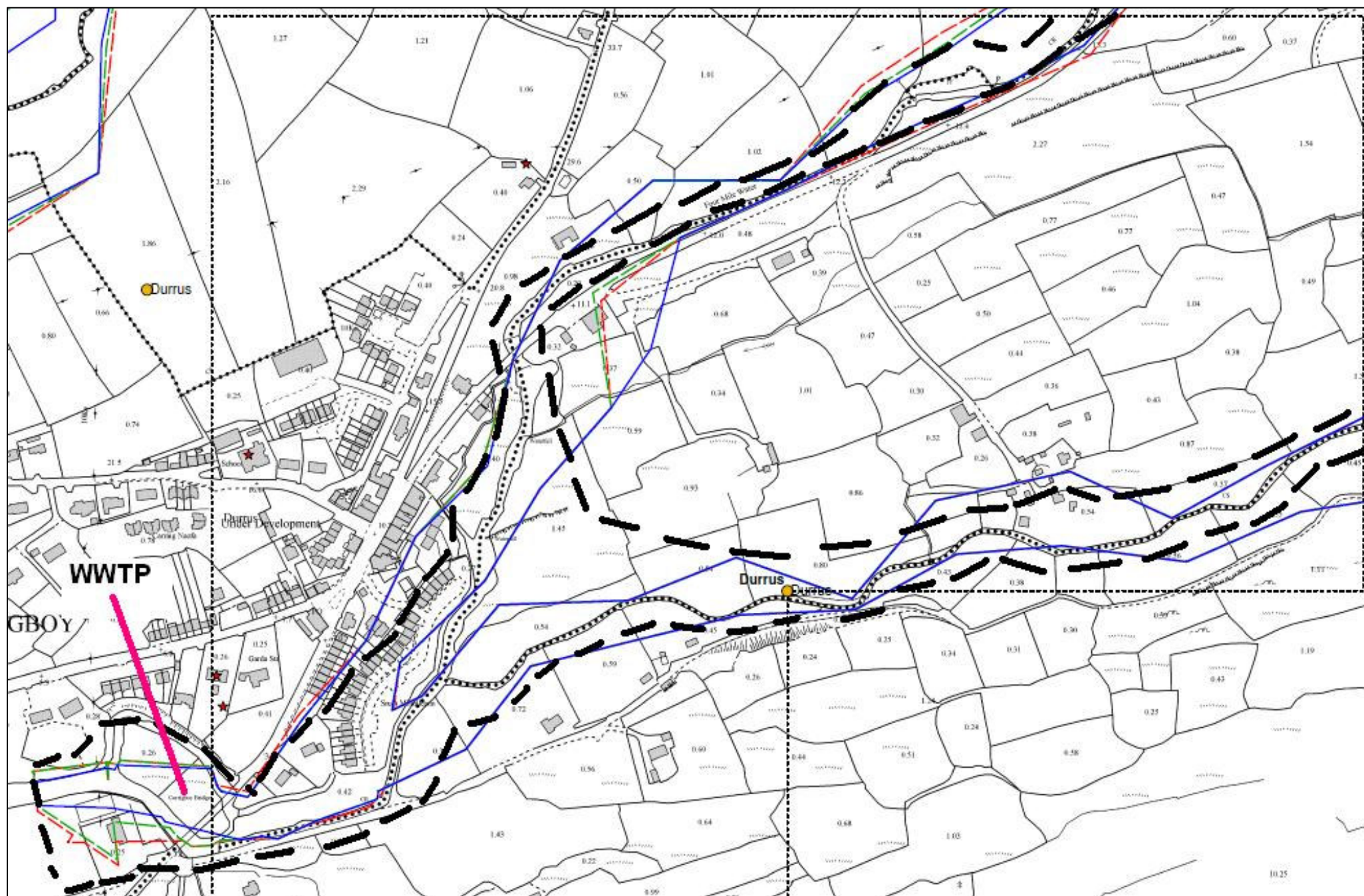
During the site visit there were no visible signs of flooding within the area

Summary:

The site is an AFA as over 25 residential / commercial properties are within the 10% AEP, along with a Primary School and a WWTP.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Faha West	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220329	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT - R1:</u> Primary school in wedge - Risk Review <u>VAL COMMENT – R2:</u> LA doesn't think it warrants RR <u>APP COMMENT R1:</u> Isolated school at risk - Risk Review and possible minor works - Not an APSR <u>APP COMMENT R2:</u> FRI = 310, but 250 of this is a school that is in a 'wedge' - Include for Risk Review to confirm status		
LA Feedback Comments: <u>LA COMMENT R1:</u> None <u>LA COMMENT R2:</u> Agree not an APSR – Don't think need risk review		
Floodmaps.ie Information: A recurring flood event is included for Ballymalis but this is outside the risk review (RR) area.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The 10%, 1% and 0.1% flood outlines are similar for the RR area except for a large extension (wedge) for the 10% boundary.		

From the site visit it is clear that this is an error since the topography rises significantly in this area in addition to the source stream being comparatively small as illustrated in the photos below:



Stream channel north of school & properties



Road and land rising to south (towards school and other properties)

This wedge is over estimating the risk south of the stream channel and amendments are proposed to resolve this. The amended boundaries are indicated on the attached map.

Receptor Comments:

From the site visit, it is evident that the model is over estimating the risk and that due to the location and size of the stream in addition to the local topography, the associated receptors are not at risk. Removing these will reduce the flood risk index from 310 to 0.

Evidence of Flooding:

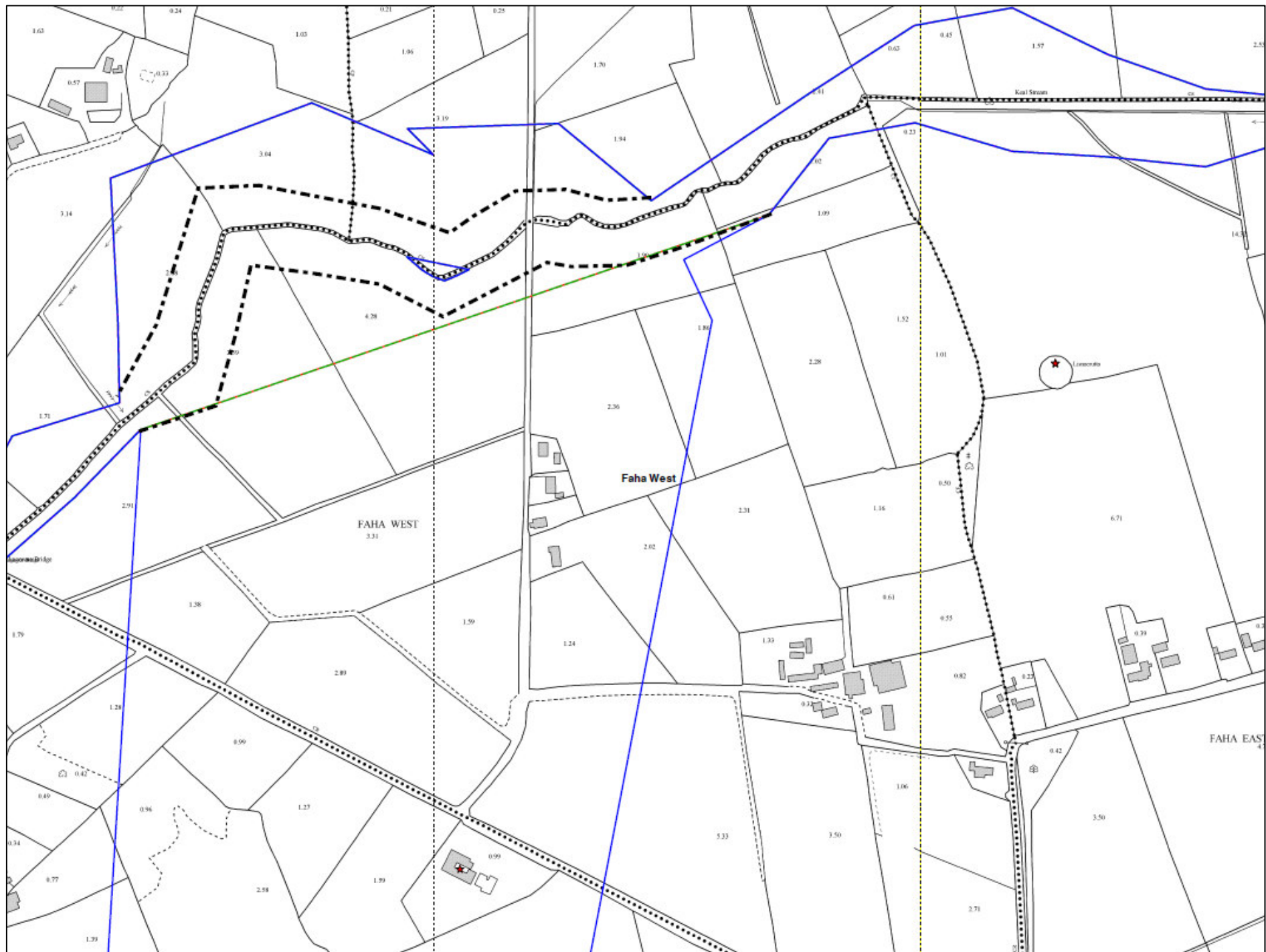
No evidence of flooding or bank over topping was observed.

Summary:

It appears that the model has overestimated the flood risk in this RR area and the revised boundaries indicate the school and other properties are not at risk. No further assessment is required.

Site Visit Findings:

Not AFA.



Revised Flood Boundary



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Farranfore	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220330	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 13 & 14/12/2011	
OPW PFRA Comments: Linear development beside river. Wedges in model at Airport.		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> LA Exclusions: LA are not aware of a serious flood risk in the village though lands get flooded about 2km North of the village near the N22 due to the River Maine. <u>VAL COMMENT - R1:</u> Land Flooding <u>APP COMMENT R1:</u> Errors in predictive flood extent - Risk Review - Not an APSR		
Floodmaps.ie Information: Three recurring flood events are recorded in the general area. Two of these are in close proximity to the airport but are outside the Area of Risk Review (ARR). Information for the relevant event includes an OPW note dated 10/08/99 which indicates that flooding between Currans and Farranfore affects 40 landowners including 3 houses and the local road. A sketch (hand marked OS map) is also included which shows the location of lands susceptible to flooding. These lands are located along the meanders of the Brown Flesk between the N22 and the railway line, north east of the village. A two page extract from a 1991 flood study report carried out for the Airport is also provided but the information included in the extract is limited. A number of newspaper articles are also provided, the most relevant of which reports a flood event in 1941 when the Brown Flesk burst its banks and damaged a railway bridge north east of Farranfore village. The bridge collapsed under the weight of a passing train and two men were killed.		

Some areas of benefiting land are also located to the west of the N22.

Stakeholder Comments:

Enquiries were made with 4 people during the survey. Three advised that flooding was not an issue at various locations west of the N22 (including at the train station as shown below).



Stream and bridge at Farranfore Railway Station

The fourth was the owner of a property near the junction of the N22 and the Currans road (south of the N22 bridge over the River Maine and he advised that flood water frequently entered his garden (see photo below) and large amounts of agricultural land in the area. He also stated that during construction of the property, the river reached levels which were high enough that the house would have been flooded. He advised that the local flood water alleviation channel was helping but not as much as he expected. During recent flood flows he noted that the water was near the soffit of the bridge over the alleviation channel.

He also mentioned that a neighbour (local farmer whose land also floods) was of the opinion that the problem was due to deposition in the river channel and that that clearance/dredging works were required.



Property affected by flooding at location of meanders in Brown Flesk River

Staff at Kerry Airport were contacted in relation to flood problems and obtaining a copy of the flood study carried out for the site in 1991. A copy of the report was subsequently obtained from Malachy Walsh & Partners – the consulting engineers who had carried out the study in conjunction with staff at UCC and the is summarised as follows;

- Existing and proposed improvement works were designed and modelled to cater for the estimated 1 in 500 year flow of 132m³/s for the Brown Flesk river.
- The proposed works included straightening of meander sections, addition of wide compound channel sections, improvement or raising of embankments along the river to the north and east of the airport and raising of land and drain provision at the south east corner of the site to divert overland flows from upstream.
- Stream culverts and drains elsewhere on site were designed to pass the 1 in 100 year flows (4 streams, various flows).

It is understood that the works and recommendations in the airport flood study report were implemented when the new runway was being constructed.

Staff at the airport also provided a topographical survey drawing which included bed and bank levels for the a section of the Brown Flesk in addition to invert levels and dimensions for existing drainage channels and culverts on site. Staff were also able to advise on past flooding issues as follows;

The site and local area is generally poorly drained with ground water levels at relatively shallow depths. As a result, a number of drainage channels are required to help drain the site and on occasion, these have been observed with near-full flow (75-150mm below soffit/ground level). Staff advised that 2-3 years ago after prolonged heavy rainfall events over a number of weeks, ground water levels lifted the tarmacadam of a taxiway/roadway and some surface ponding occurred between the old runway/hanger building and the taxiway to the new runway.

Staff advised that the Brown Flesk has not flooded the site in at least 20 years although the river channel was straightened and improved in the early 90's as part of the new runway development (this is the subject of the 1991 flood study report). Raised ground levels at the east end of the site and along some of the northern perimeter helps to ensure that the river does not enter the site. Staff did however advise that water levels rose close to the top of the bank a few years ago and that an approach light located on a concrete plinth near the waters edge was once washed away.

In addition, an on site electrical substation at the east end of the new runway was affected by water levels associated with on site drains in winter of '94/'95 while other airport equipment at the west end of the site was also affected by drain water levels in October 1989. Equipment at both these locations has since been elevated or defended and flooding has not recurred.

Staff at Kerry Co. Co. were also consulted in relation to flooding at Farranfore and they advised as follows;

There are no known problems in the village. Flood waters had in the past affected the N23 at the location of the bridge over Brown Flesk (near the airport) but that the road had been raised at some stage and flooding was no longer thought to be a problem.

Flooding was known to occur at the Brown Flesk meanders east of the N22 and the new bridge and flood relief culvert had helped reduce this. However, it was thought that the recent works may not be helping as much as was anticipated (similar viewpoint to local resident). Staff advised that a gate near this location is sometimes removed by KCC when flooding is expected as it is thought that debris gets trapped in the gate thereby restricting overland flow (assumed towards Maine via flood culvert). Staff advised that the garden centre and lands immediately west of the N22 are not affected by flooding.

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis.

From on site observations and discussions with locals, it appears that the flood risk boundaries are being over estimated in some locations, mainly for

water courses west of the N22 and in the village.

The works designed and carried out in the early 90's may mean that the airport may in fact be protected from flooding by the Brown Flesk for events up to 1 in 500. This appears to agree with the PFRA outlines as these generally do not encroach on the airport site.

The predicted PFRA outline associated with one of the culverted streams does however encroach upon the site. However, the report indicates that this culvert should have been constructed to cater for the 1 in 100 flows and the topographical survey indicates that this is indeed the case. As a result, it appears that this outline should be removed.

The outlines were modified to show what is thought to be a more accurate flood extent and the revised outlines are indicated on the attached map.

Receptor Comments:

The revised flood lines indicate that approximately 68 commercial/residential properties in addition to a number of low value monuments can be removed from the flood risk index.

Although the airport is at a low lying and poorly drained location, it is thought that this is not affected by the Brown Flesk River due to the improvement works carried out in the early 90's.

Where flooding is indicated on the PFRA mapping, this appears to be associated with a culverted stream. Following receipt of a topographical survey from airport staff, a comparison of culvert capacity with predicted flows was carried out and it is thought that the capacity of the channels is sufficient. As a result, it is thought that the airport receptor can be removed from the flood risk index.

The removal of the airport and the residential receptors reduces the flood risk index to 244.8.

It is worth highlighting that at one location in the western part of the ARR, a blockage was noted at the entrance to residential house (as shown in the photo below). Although flooding is report not to be an issue in this area, it is recommended that maintenance is carried out at this location.

**Evidence of Flooding:**

High water marks and evidence of recent flood flow paths (generally in agricultural lands) were visible in many locations along the Brown Flesk river.

As mentioned above, a flood alleviation channel has been constructed near the meanders in the Brown Flesk River (east of N22 at garden centre) and while no water was overflowing into this during the site visit, it was evident that the channel had recently been in use.



Spillway to flood alleviation channel



Evidence of recent high flow in flood alleviation channel (matted grass on far bank)

For most of the smaller drains and channels, evidence of high flows could be seen but there was no indication that the banks had been over topped.



Old bridge over River Maine (adjacent to current N22 bridge)

Summary:

Although there are some definite flooding problems in this ARR, the site visit has resulted in exclusion of multiple receptors west of the N22. In addition, it is thought that the airport is not affected by the Brown Flesk.

Excluding these properties and the airport which is a major receptor means the index has fallen below the threshold for further assessment.

However, it is recommended that some channel improvement or defence works should be carried out to address known flood problems where residential homes may be affected – most notably east of the N22 along the meanders of the Brown Flesk River.

In addition, it is recommended that the Brown Flesk channel is maintained and monitored between Currans and O'Connell Bridge to ensure that the same standard of protection (1 in 500) provided by the past improvement works is still valid.

Site Visit Findings:

Not AFA.

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Fermoy	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180252	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 14/12/2011	

OPW PFRA Comments:

VAL COMMENT – R1

High Total FRI, Historic Hazard High, Local Authority and OPW Regional Feedback with High Severity

APP COMMENT – R1

Approved - APSR – FRS

OPW REGIONAL ENGINEERS INPUT

Many properties in inundated area identified in FRS study. FRS not constructed yet.

LA Feedback Comments:

LA COMMENT – R1

Fluvial. Every two years. Regional route through town flooded. Treatment plant, Town Hall, Bridge Street Town centre zoning.

LA COMMENT – R2

Flooding an issue

Floodmaps.ie Information:

Twelve flood events are recorded on the website:

1. Flooding at Fermoy, Co Cork November 2009
2. Blackwater Fermoy December 1998
3. Blackwater Fermoy November 1980
4. Munster Blackwater Castlehyde Nov 2000
5. Munster Blackwater Fermoy Nov 2000
6. Blackwater Fermoy 6 August 1986
7. Blackwater Fermoy, Co. Cork Recurring
8. Blackwater Fermoy March 1995
9. Blackwater Fermoy Dec 1948
10. Blackwater Fermoy August 1946
11. Blackwater Fermoy Nov 1916
12. Blackwater Fermoy Oct 1988

Eleven of these flood event records are within the risk review area on the overview map.

Flood Event 1:

The River Blackwater flooded Fermoy town on the 19th and 20th November 2009. The peak flood level recorded was 24.9m OD Malin. South of the river, flooding occurred at 22 residential properties and 16 commercial properties. Access to Fermoy hospital, swimming pool, rowing club and youth centre were also affected. Roads in town affected were 950m of the N72 secondary national secondary road, 320m of the R666 and 650m of urban roads. A map showing the extent of the flood was included in the report.

Flood Event 2:

Flooding occurred at Fermoy on 30th and 31st of December 1998. This event had lower flood levels than the 1980 and 1988 floods.

Flood Event 3:

One of the largest flood events recorded at Fermoy occurred on 1st and 2nd November 1980.

Flood Event 5:

Flooding of the quays and eastern sections of Fermoy town occurred on 6th November 2000.

Flood Event 6:

Flooding of the quays and eastern sections of Fermoy town occurred on 6th August 1986.

Flood Event 7:

This event records that flooding is recurring in Fermoy town.

Flood Event 8:

Flooding occurred in Fermoy town on 10th March 1995. This event had lower flood levels than the 1980 and 1988 floods.

Flood Event 9:

Flooding occurred in Fermoy town on 2nd December 1948.

Flood Event 10:

Flooding occurred in Fermoy town on 11th August 1946.

Flood Event 11:

Flooding occurred in Fermoy town on 16th November 1916.

Flood Event 12:

One of the largest flood events recorded at Fermoy occurred on 11th October 1988.

Stakeholder Comments:

The Cork County Council Area Engineer advised that the most common flood in Fermoy town was the 1:5 year return period flood which is approximately 600mm height flood. The completed flood protection works north of the river were designed for a 1:100 return period flood. He raised concerns over the need to deploy the full demountable 1:100 year return flood gates for minor 1:5 year events, especially non-programmed erection of steel members at night. The flood protection works contract south of the river is currently at Tender Stage.

A resident from the area noted that trees in the river regularly block flow under the bridge and this exacerbated flooding in the town.

Predictive PFRA Flood Outline:

Based on the site visit and flood event records, it appears that the 10% AEP flood extent outline north of the river is underestimated in the town park area. Refer to the attached maps included in the Appendix to this Site Inspection Report.

Receptor comments:

The amended 10% AEP outline reallocated three premises from the 1% outline area to 10% outline area. This would lead to an increase in the Total FRI score of 27 giving a Total Flood Index of 4073.4.

Evidence of Flooding:

Permanent and demountable flood protection works have been installed in the town north of the river to a height of approximately 3m above the existing bank levels. Refer to the attached maps included in the Appendix to this Site Inspection Report.



Flood Protection works north of the river at the bridge



Flood Protection works north of the river west of the bridge

Sand bags were noted outside a commercial property south of the river on O'Neill-Crowley Quay.



Sand bags on O'Neill-Crowley Quay.

A modern commercial building constructed south of the river on Ashe Quay has raised foundation compared to adjacent buildings.



Raised foundations on Ashe Quay.

There was debris including a number of tree trunks lodged on the upstream side of the bridge



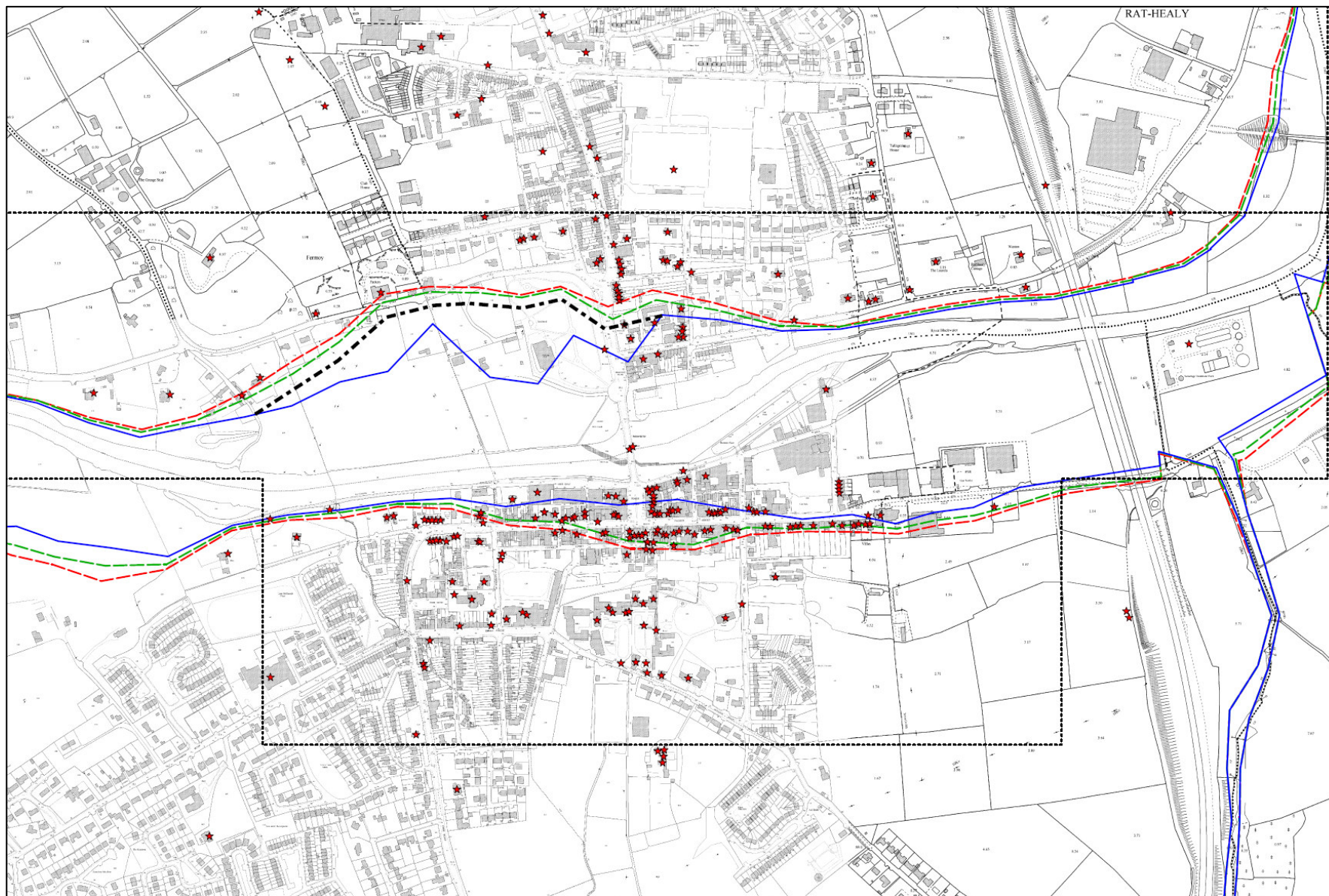
Debris lodged at the bridge pier

Summary:

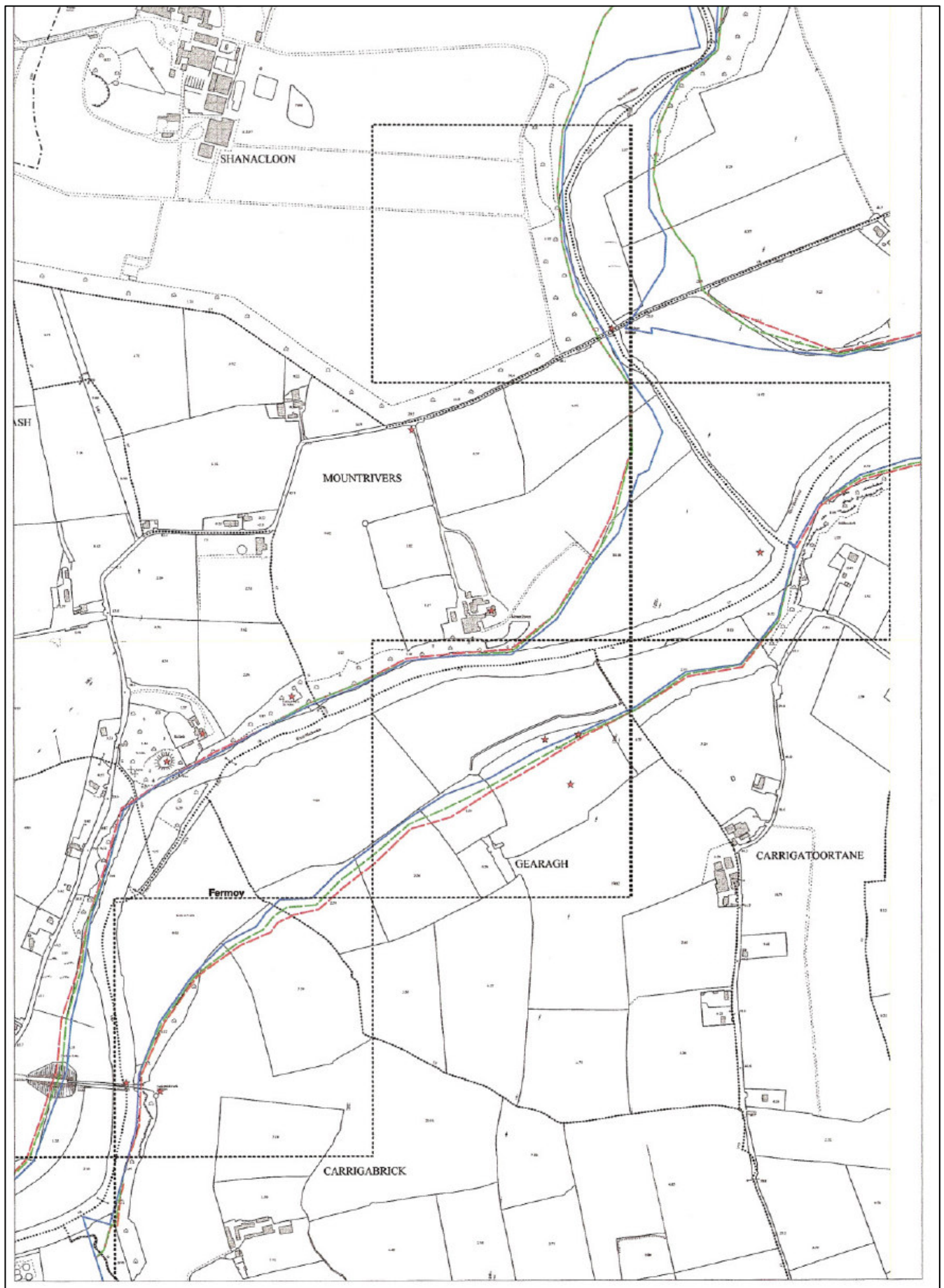
This site is an AFA because the high number of properties affected by regular flooding. However, flood protection works for the town have been designed and partly constructed.

Site Visit Findings:

AFA.



Fermoy South
Revised Flood Boundary - - - - -



Fermoy North: No changes proposed to flood boundaries

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Fieries	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220331	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 09/12/2011	
OPW PFRA Comments: Wedges present effecting risk numbers need to be checked		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> LA are not aware of any particular flood risk here. <u>VAL COMMENT - R1:</u> LA - not aware of any risk, Wedges in Model <u>APP COMMENT R1:</u> Errors in predictive flood extent - Risk Review - Not an APSR		
Floodmaps.ie Information: The website does not contain any record of historical flooding within the risk review area on the overview map. However, areas of benefitting land are present nearby and a number of flood points associated with the Brown Flesk are also located further east near the N22. The extent of benefitting land correlates well with the predicted flood extents in most areas with the exception of the townlands of Bohereens and Killahane.		
Stakeholder Comments: A post man was consulted in relation to flooding in the village and he advised that he had never encountered any problems with flooding in this area. However, Kerry Co. Co. staff were able to advise that a pub, shop and some houses near the bridge in the village had been affected by flooding a few years ago (possibly 2007). Staff advised that new residential housing developments in the area had been largely blamed for these flooding problems although it is unclear whether this was a surface water/pluvial issue or if the river channel capacity had been affected. Staff also noted that the water levels associated with the stream had		

sometimes reached the road level adjacent to the bridge.

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. However, there appear to be large wedges present near convergence points of watercourses. In some cases the wedges extend over large areas between minor drainage channels where it appears highly unlikely overland or serious flooding would occur.

Changes to the flood outlines are proposed and are indicated on the map attached to this Site Inspection Report.



Existing road bridge and new pedestrian bridge in Fieries Village

Receptor Comments:

In some cases, it is difficult to determine the required extent of changes to the boundary lines in this area.

As a result, resolution of obvious anomalies in the outlines relating to smaller water courses was carried out first. This resulted in approximately 13 residential/commercial properties being removed from all 3 fluvial outlines.

Following the correction to the outline in the Village a further two receptors were excluded from consideration.

It should be highlighted that a planning notice at the entrance to a field just downstream of the village bridge indicated that a license was being sought for discharge of treated effluent from a waste water treatment plant. It is unclear if a treatment plant or just an outfall is to be constructed at this location but it is recommended that the Local Authority are made aware of potential flood risks in the area.

Evidence of Flooding:

No evidence of flooding observed and no flood defences were present.

Summary:

Since the PFRA flood risk index is not far above the threshold (270), reducing this by excluding 15 properties will mean that it is now below the threshold (120) and does not warrant further assessment.

However, it is recommended that the impact of local development in recent years on drainage systems and the local stream is further considered by the Local Authority to determine if recurrence is likely.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Fossa	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 225503	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R2</u> None <u>APP COMMENT – R2</u> LA refer to flooding at west end of village - No further information available – Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R2</u> Flooding occurs at west end of village		
Floodmaps.ie Information: No flood events recorded on the Floodmaps.ie website for Fossa. No information available on website.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: From the site visit it would appear that the predicted outlines within Fossa are reasonable representative of the local topography however some minor amendments are required. Based on the site visit the PFRA outlines for Fossa have been amended as shown in the attached map.		



West side of Bridge on Local Road - Douglassha Stream

Receptor Comments:

The amendments to the predicted outlines do not result in the addition/removal of any residential or commercial properties to/from the Flood Risk Index (FRI). It is noted that no score has been allocated to Fossa within the OPW PFRA database, however from the site visit and from review of the risk review area on the overview map for Fossa a Flood Risk Index (FRI) score of 30 would be considered appropriate. This FRI score would include a maximum number of 3 residential or commercial properties within the AEP flood outlines.

Evidence of Flooding:

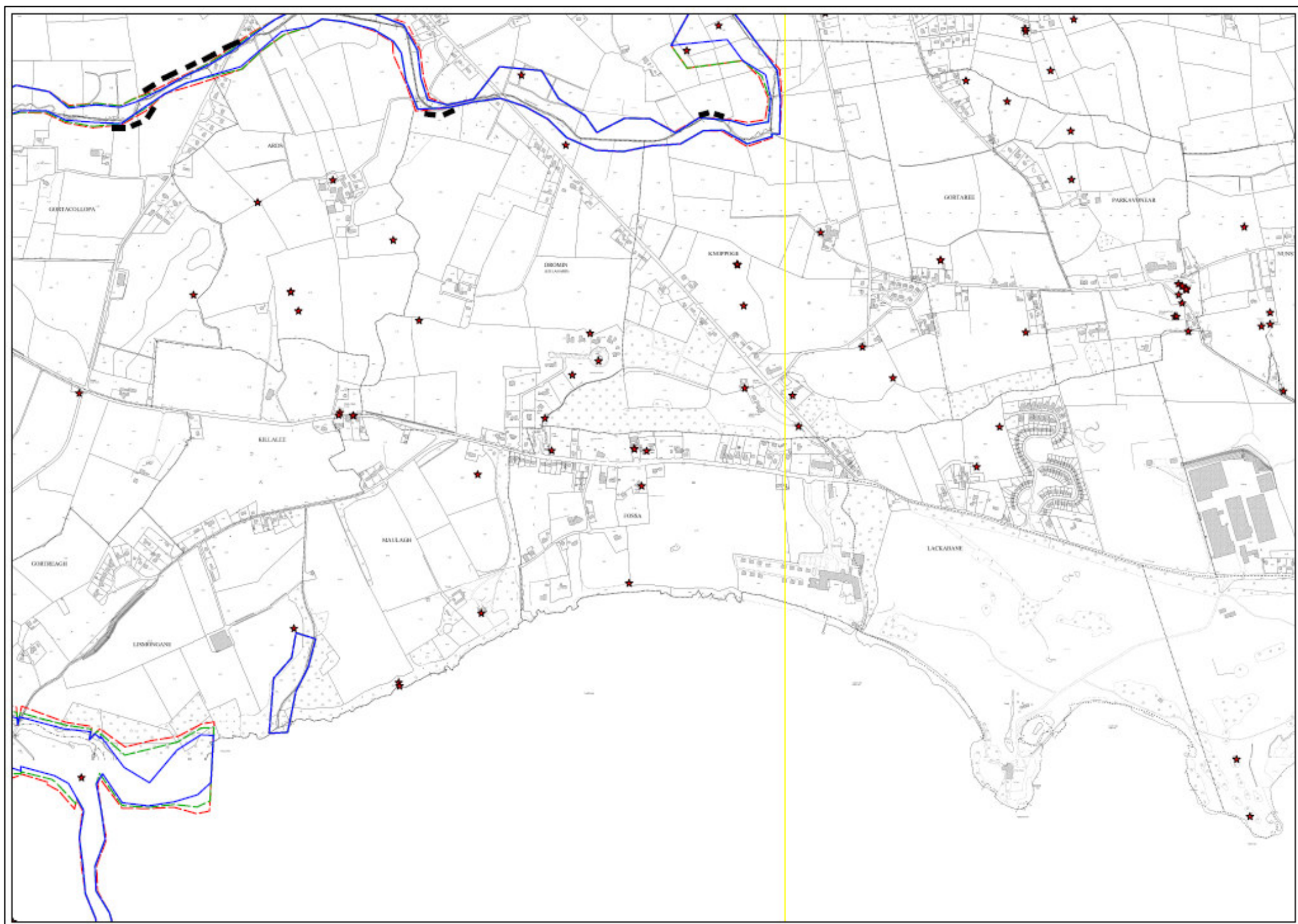
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Fossa.

Summary:

The Site is not an AFA as the vulnerability of the area to flooding is very low and the predicted FRI score for Fossa falls below the 250 score threshold.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Freemount	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180253	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 12/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> No OPW Regional Feedback, Low Historic Risk and Hazard, Some flash flooding previously, High Total FRI <u>APP COMMENT – R1</u> Approved – APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Bad flash flooding a few years back <u>LA COMMENT – R2</u> Flooding an issue		
Floodmaps.ie Information: One flood event recorded on website: 1. River Allow Freemount, Co. Cork, August 1997 <u>Flood Event 1:</u> This event started on 26 th August 1997, when a high intensity storm occurred. The four eyed culvert under the R578 was blocked with debris. Combined with this and large volumes of water on the three roads at the north side of the village a flash flood occurred on the main street.		
Stakeholder Comments: <u>Residents Discussion 1 – Owner of Kate’s Quick Pick Shop</u> Owner noted that no flooding has occurred in the village since the culvert at the north side of the town was replaced with a box culvert and extra capacity was added to stream west of the town. She noted that two years ago (2009), a large flood flow filled the new culvert to capacity, but the village did not flood. It was noted that bedrock is close to the surface around the village and all rain runs off quickly into the stream.		

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The flood outlines generated by the PFRA assumed that the existing river channels contained flow up to Qmed and that flows greater than this spilled onto adjacent lands. In Freemount the capacity of the culverts upstream of the town are much greater than Qmed so the outlines from the PFRA are overestimated.

The information provided by OPW on the flows used to generate the PFRA outlines were queried in respect of Freemount. The flows used were as follows. Q10=2.56m³/s and Q100 = 3.66m³/s.

In the report on the flooding that occurred on 1997 the flows were estimated to be Q5= 9.9m³/s , Q100= 16.3m³/s. From this information it is apparent that there is some doubt in relation to the flows generated by the PFRA that should be investigated further.

Receptor Comments:

The number of residential and commercial properties within the flood risk areas appears to be overestimated. The amendment of the Flood Risk Outline has confirmed that only 16 residential/commercial premises are within the 10% AEP flood risk outline. Also, the primary school is now outside all of the PFRA flood extent outlines.

This would lead to a total in the residential and commercial fluvial flow risk index of 160 and a primary school risk index of 0, which would reduce the Flood Risk Index total from 755 to 195.

Evidence of Flooding:

Culverts under the R578 has been replaced and addition capacity has been added to the stream west of the village.



New Culvert under R578 at north side of village. One of the four old culverts is blocked up at the right side



Flood overflow behind houses on west side of R578 in the village.

Summary:

On the basis that the number of receptors at risk from moderate flooding predicted by the PFRA in Freemount is low the site should not be considered an AFA. However there is some doubt in relation to the flows used in the PFRA which could raise concern regarding the revised outlines generated. For this reason it is recommended that the site be studied as an AFA where an existing Flood Relief Scheme is in place.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Glenflesk	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 225502	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 13/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> '22 House flooded - see also Curreal (Ref:- 222595) <u>APP COMMENT – R1</u> Reports of Flooding – Risk Review – Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Lands, Local Road L7059 and National Primary Route N22 at risk from River Flesk in Garries Bridge/Foiladuane area. Also Clydagh Valley at risk of flooding. Fields but unsure as to the properties influence		
Floodmaps.ie Information: Under Glenflesk, the website does not contain any documents. However, under Curreal (which is within the same flood outlines) a number of documents are available including correspondence, newspaper clippings and reports. However, the majority of these documents are unrelated or non specific to the site inspection areas. A number of the documents are general reporting on Hurricane Charlie.		
Stakeholder Comments: KCC provided a report on Glenflesk (Glenflesk Flood Relief Pre-feasibility Study). KCC raised a number of issues in relation to flooding of roads including the National Primary Road (N22) and regional roads which resulted in restricted access to a number of properties. The LA emphasised that they consider the N22 to be a piece of critical infrastructure on the basis that when it is blocked this causes massive disruption to commerce and tourism in the County.		

Predictive PFRA Flood Outline:

There is no information available for Glenflesk (or Curreal) from the PFRA stage, including no PFRA boundary for the area or FRI score. However, a separate boundary area was provided and the site inspection focused on the flood risk outlines within this boundary which included Glenflesk and Curreal.

Overall, the predicted 10%, 1% and 0.1% AEP fluvial outlines appear reasonable with no major anomalies. However, there is a negative wedge in the 10% AEP fluvial outline to the north west of Glenflesk and Curreal. Based on the site visit this outline has been modified to align with the 1% and 0.1% AEP outlines. The river bank and topography of the surrounding area to the north of the river is very flat and is approximately 1m lower than the southern bank. This is reflected in the large spread of the flood extents to the north.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Glenflesk – property at risk.



Glenflesk – view of river behind GAA pitch

Receptor Comments:

As mentioned above, there is no FRI score available for Glenflesk (or Curreal) from the PFRA. However, based on the site visit and the modified flood outlines there are approximately 14 residential / commercial properties (2 of which are derelict) within the flood risk outlines. This would result in a maximum FRI score of 140 which is well below the threshold score.

It should also be noted that this includes a number of houses which may be designated as being within the Curreal catchment.

Evidence of Flooding:

During the site visit there were no visible signs of flooding within the area. Local residents advised of significant flooding during the early 1980's which resulted in a number of houses and the local GAA pitch being flooded.

Glenflesk Flood Relief Pre-Feasibility Study

The report provides historical evidence of flooding between Glenflesk Bridge and Loo Bridge (Derreenacullig) which resulted in the flooding 23 houses, 3009 acres, the loss of 209 livestock, and 322 road access disruptions.

The extent of this area is well beyond that of the site inspection boundary and is

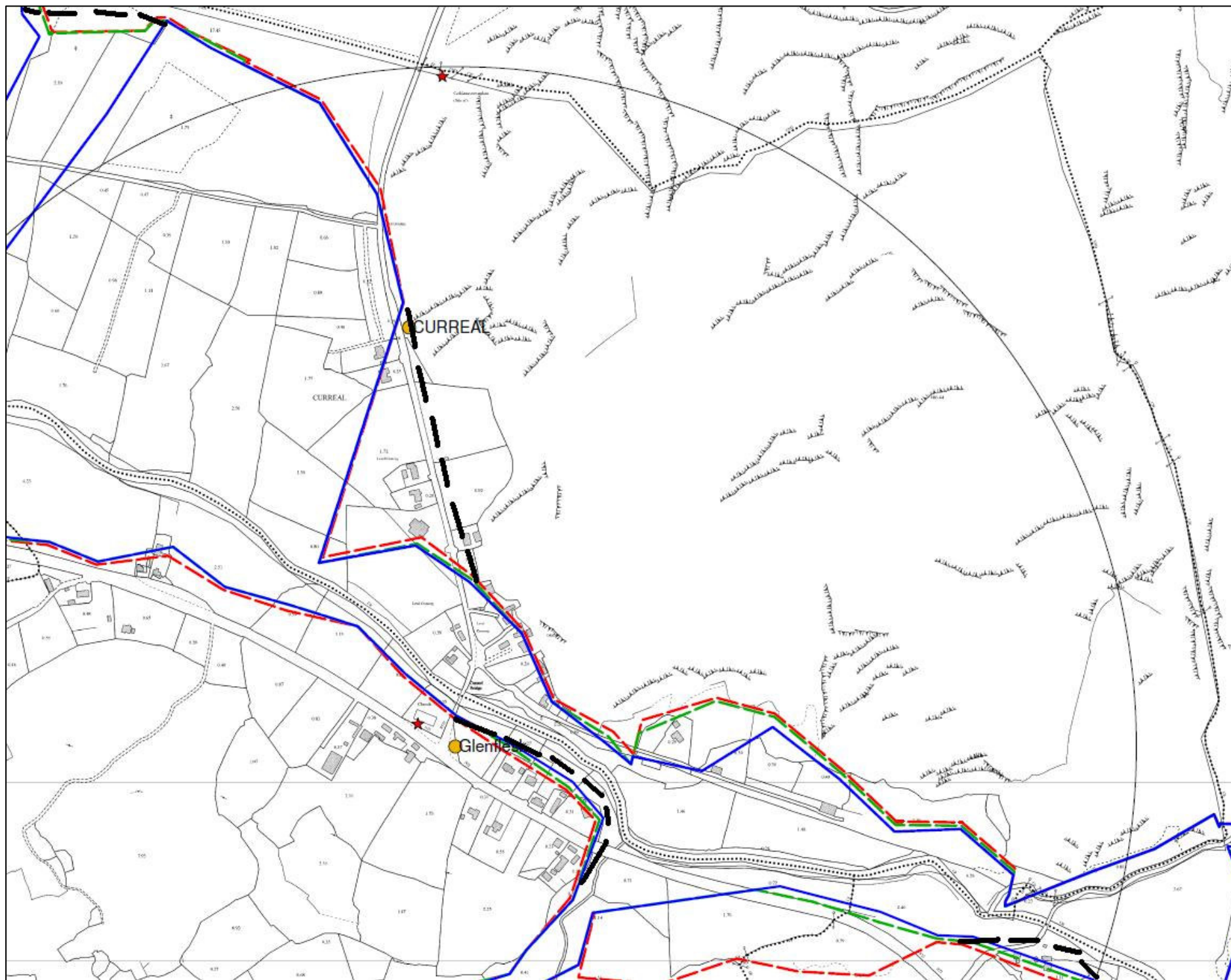
likely that 14 of the 23 receptors are from the Glenflesk / Curreal area. However, even allowing the 23 properties, this would not provide a FRI score higher than the threshold.

Summary:

No information is available for Glenflesk (or Curreal) from the PFRA stage. The area of inspection was the flood risk outlines within the boundary area provided which included Curreal. The site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Gortnacarriga	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220335	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: David Murphy	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT - R1:</u> Nursing Home in Flood Zone, LA Low severity <u>APP COMMENT R1:</u> Isolated Nursing Home at risk - Risk Review and possible minor works - Not an APSR		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> LA are not aware of any particular flood risk here.		
Floodmaps.ie Information: The website does not contain any record of historical flooding within the risk review (RR) area or within 2.5km.		
Stakeholder Comments: Enquiries were made with 5 people in the area and in general, feedback indicated that properties were not affected by flooding. In relation to the nursing home and properties at the more southern N22 stream crossing in the risk review (RR) area, it was reported that flooding from the relevant streams had once been an issue but culvert improvement works had largely resolved the issues. The level in the garden of a property in the south end of the RR area had also been raised and although flood waters still enter here at times of high flow, the house is no longer affected (see photo below). Some stakeholders also advised of pluvial flooding at a number of locations in the area. The Local Authority had no specific issues in relation to this site.		



Stream culvert inlet at nursing home



**House which is no longer affected due to culvert improvement works
(garden is still affected)**

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. However, from the site visit these would appear to be overestimating flood risk in the RR area.

Through comparison of the PFRA flood lines with the topography observed on site, the outlines were modified to show a more likely flood extent as indicated on the attached map.

Receptor Comments:

Examining the revised flood lines, it is estimated that 15 properties including the nursing home can be excluded from the 10% AEP flood boundary.

Evidence of Flooding:

No evidence of previous flooding was observed on site although some high water marks were observed in channels. No evidence of over topping was observed.

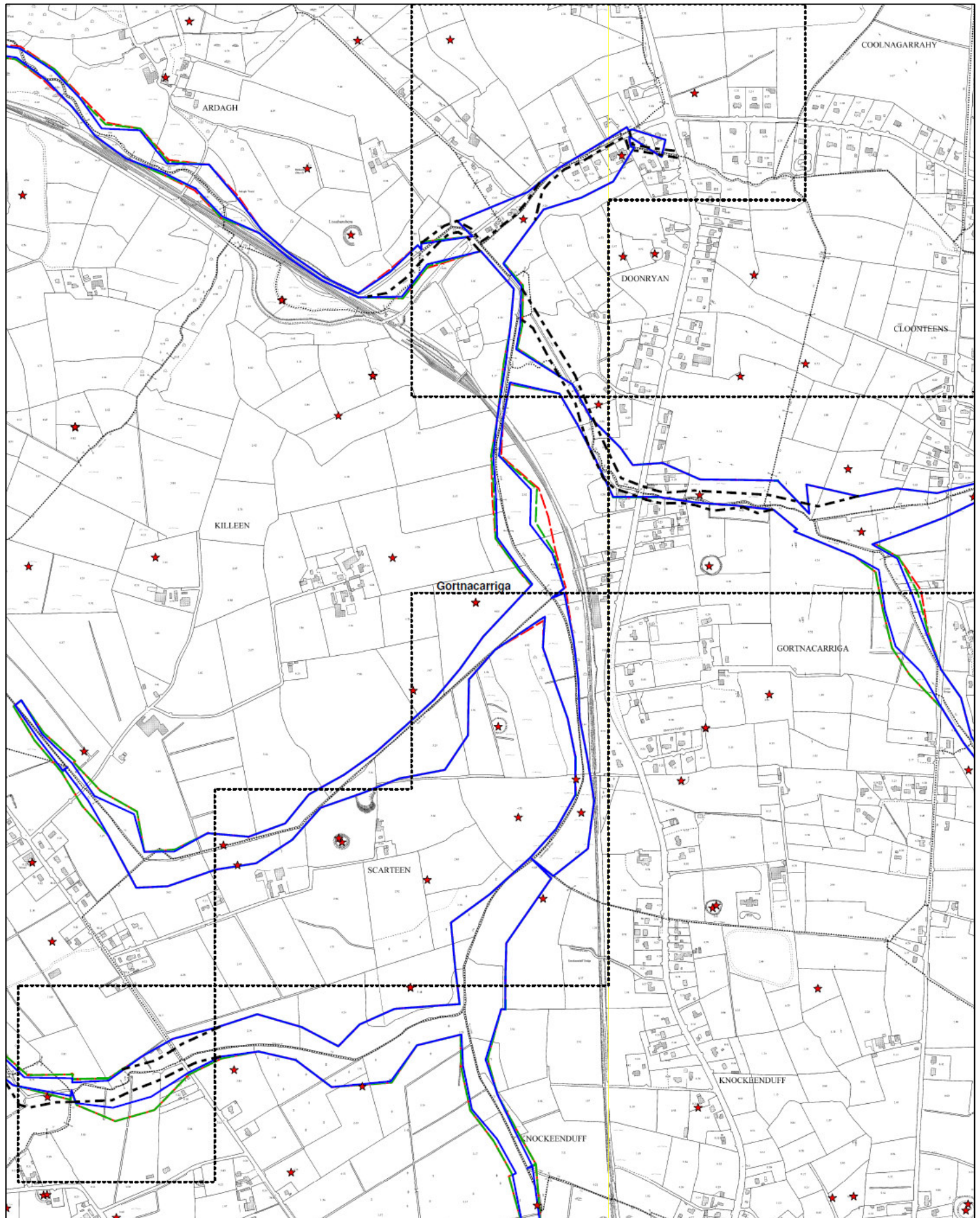
Summary:

It appears that the model has overestimated the flood risk in this RR area and

the revised boundaries indicate the nursing home and other properties are at less of a risk than indicated by the model. As a result, no further assessment is required.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Inishannon	Hydrometric Area: 20	County: Cork.
Unique OPW ID: 200298	Site Type: CAR	Source of Flooding: Fluvial & Coastal
Surveyor: Mark Cotter	Date: 8/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> High score due to garda station, Low Historic Risk and Hazard <u>APP COMMENT – R1</u> Approved - APSR - Some work completed under Bandon Study		
LA Feedback Comments: <u>LA COMMENT – R1</u> Influence of Garda Station <u>LA COMMENT – R2</u> Flooding an issue		
Floodmaps.ie Information: Two flood events recorded on website: 1. Flood ID 5168 – River Bandon Flooding Inishannon main street recurring 2. Flood ID 5169 – Road Flooding at Upton railway station recurring Only one of these events is within the risk review area on the overview map. <u>Flood Event 1:</u> It was recorded in the meeting minutes 21/04/2005 with the Bandon Area Engineers that flooding was recurring on the main street in Inishannon.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site. Contact was made with a local resident in the area and description of the flooding history was recorded. <u>Residents Discussion 1 – Owner of Fine Art Gallery:</u> Owner noted that there had been a large flood in 2009, where water rose up to the back of the gallery buildings (south side). This was the only event she		

could recall where water had risen that far previously. However, she noted that surface (pluvial) flood water does regularly come down the hill on the road (Bothar na Sop) opposite the gallery west of the Garda station. On one occasion a few years ago, when the gullies in front of the gallery were blocked this surface flood water entered the front door of the gallery.

Information was provided by CCC relating to flooding in Inishannon. This information was gathered at a public information day for the River Bandon (Bandon) Drainage Scheme. This information detailed flood extents that occurred during the November 2009 flood event. This information identified that one premises on Main Street was flooded to a depth of 100mm (4 inches) during that flood and another property at the West end of Main street had water 1.2m deep (4 feet) in its basement.

Predictive PFRA Flood Outline:

The only 10% AEP fluvial flood extent outline provided relates to the stream running east of the N71 road on the northeast approach to the village. This outline appears to be exaggerated on the west side of Main Street. Based on eye witness account and topography in the town, the 10% AEP flood extent outline has been amended. Refer to drawing attached.

A 10% outline for the Bandon River was not provided. The flood event that occurred in November 2009 is estimated to have been between 410 and 420 m³/s at its peak at the gauge upstream of Inishannon. This is approximately a 1 in 200 year event (0.5%AEP). At the East end of the Village this flood extent was recorded at the back door of the Art Gallery. At the West end it flooded one basement and the Pharmacy to a depth of 100mm. From this information it is reasonable to infer that the 100 year event would not flood premises on Main Street nor would it flood properties adjacent to the Main Street at The Lawn next to the Art Gallery. It is also reasonable to infer that the number of properties at risk from a 1 in 10 year flood event from the Bandon River would be limited to two or three in number. The coastal flood extent outlines do not appear to have a significant impact on the town.

Receptor Comments:

The amendment of the flood extent outline would indicate that there are 13 residential / commercial properties within the revised 10% AEP outline, one Garda Station between the 10% and 1% outlines and 59 residential / commercial properties and the parish hall between the 1% and 0.1% AEP outlines. This would lead to a total FRI score of 60.9 for Inishannon.

Evidence of Flooding:

No evidence of flood damage was noted during the site visit.





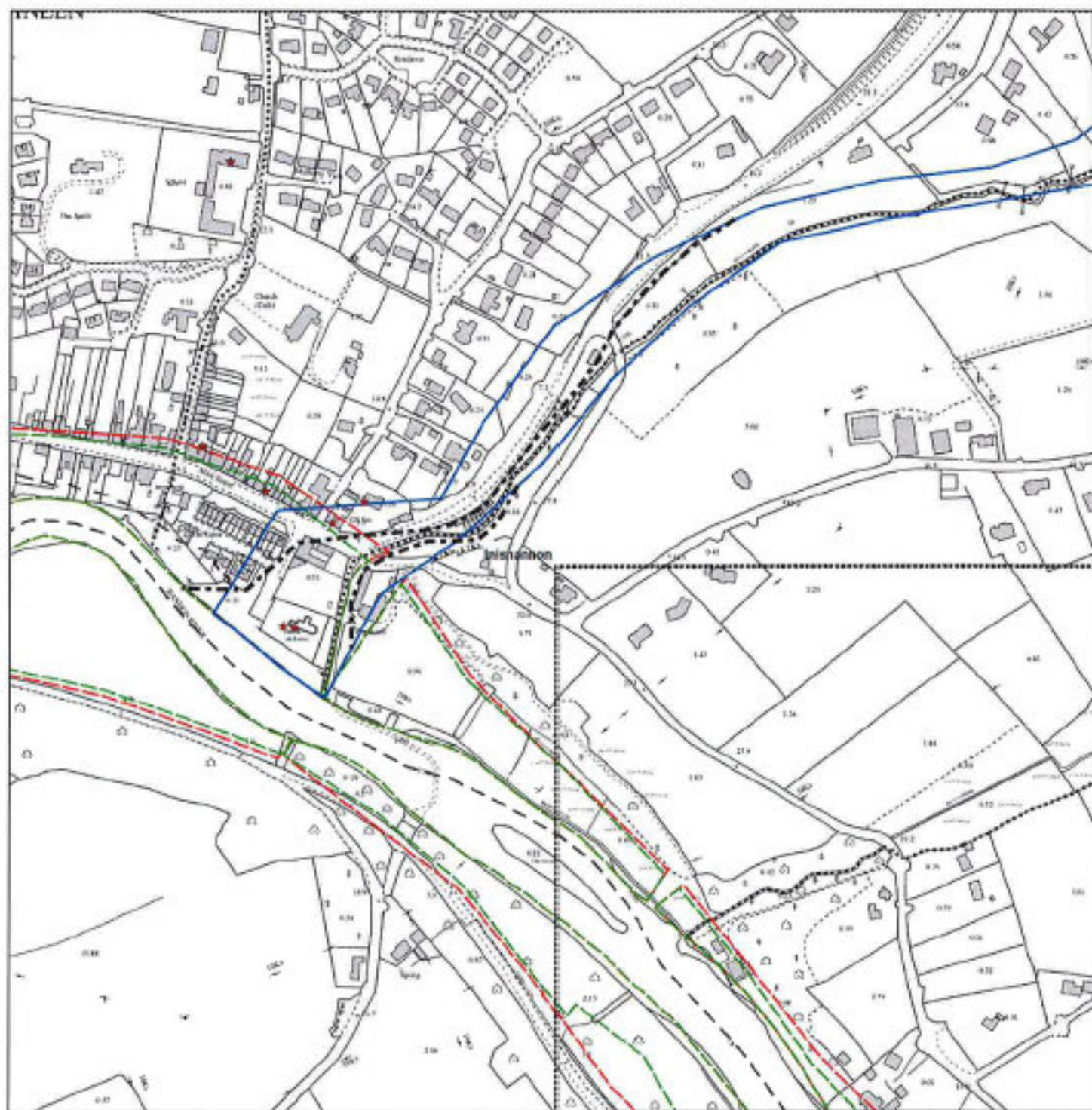
Photographs of flooding in Innishannon during November 2009 provided courtesy of Cork County Council.

Summary:

This site is not an AFA because the number of receptors affected by the flooding is low. It would appear that the flooding is mainly due to pluvial flow associated with blocked gullies and culverts. It is recommended to remove debris and vegetation restricting the stream east of N71 on the northeast approach to the town and improve the drainage system on Bothar na Sop road west of the Garda station.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Innisfallen Abbey	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220316	Site Type: IRR for RR	Source of Flooding: Fluvial
Surveyor: Barry O'Connor		Date: 9/12/2011
OPW PFRA Comments: FRI Score low, Monument may be resilient to flooding, Island issues with model. Not an APSR		
LA Feedback Comments: No Comments		
Floodmaps.ie Information: No records of flooding at this site.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: It was not possible to access this site during winter months as the boat service was not operating. There are no flood extent outlines shown on this island which would indicate an error in the DTM or in the predictive modelling. From the shore the level of the island seemed quite high relative to the shoreline of the lake.		



Innisfallen Island

Receptor Comments:

The receptors located at this site include a religious house, three churches an ecclesiastical site, cross slabs and a grave slab. These receptors are classified as having low vulnerability to flooding.

Evidence of Flooding:

There were trash marks on the shoreline and in the car park of Ross's Castle opposite Innisfallen. The ground level of the island appeared to be higher than these marks.

Summary:

It is not certain that this site is vulnerable to flooding from rising lake levels but it would appear likely that some if not all of the site and receptors are on elevated ground. The receptors are of low vulnerability and it is likely that they would not be adversely impacted upon by low velocity onset lake flooding. For these reasons it is considered that this site is not an AFA.

Site Visit Findings:

Not AFA.

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kanturk	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180254	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 12/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> High Historic Risk, High Total FRI <u>APP COMMENT – R1</u> Approved - APSR		
LA Feedback Comments: <u>LA COMMENT – R2</u> Flooded in the 80s. Big drainage scheme done in the late 80s.		
Floodmaps.ie Information: Eight flood events recorded on website: <ol style="list-style-type: none"> 1. Dalua Allow Kanturk 6 August 1986 2. Dalua Kanturk Park June 1982 3. Dalua Kanturk Nov 1980 4. Brogeen River Oct 2004 5. River Dalua at Kanturk Town Park recurring 6. River Allow Kanturk R579 Strand Street recurring 7. Brogeen River recurring 8. Greenane near Kanturk recurring <p>Eight of these flood event records are within the risk review area on the overview map.</p> <p><u>Flood Event 1:</u> On 6th August 1986, flash flooding occurred throughout County Cork including Kanturk. A Cork County Council report on Flood warning systems in Cork County included a map indicating the extent of the Kanturk flood plain.</p> <p><u>Flood Event 2:</u> In June 1982, Kanturk town park area was flooded.</p> <p>Minutes of a meeting with Cork County Council Area Engineer for Newmarket Area on 27/04/2005 identified the following area subject to flooding.</p>		

Land flooding at location of Kanturk Town Park due to high flows in River Dalua, occurs bi-annually – recurring. Flood ID 5148

Flood Event 3:

In November 1980, south of the Dalua confluence with the River Allow, the town west of the river flooded to a depth of up to approximately 2m.

Minutes of a meeting with Cork County Council Area Engineer for Newmarket Area on 27/04/2005 identified the following area subject to flooding. Kanturk R579, Strand Street road flooding as a result of high flows in River Allow – recurring. Flood ID 5146

Flood Event 4:

In October 2004, flooding occurred downstream of Kanturk due to flooding of the Brogeen River.

Minutes of a meeting with Cork County Council Area Engineer for Newmarket Area on 27/04/2005 identified the following area subject to flooding. Land flooding in Oct 2004 from the Brogeen River – recurring. Flood ID 5147 & 5158

Flood Event 5:

Recurring flood of Kanturk town park area. Refer to flood event 2.

Flood Event 6:

In November 1980, the R579 Strand Street road in Kanturk flooded. Refer to flood event 3.

Flood Event 7:

Recurring flood of Brogeen River area. Refer to flood event 4.

Flood Event 8:

Minutes of a meeting with Cork County Council Area Engineer for Newmarket Area on 27/04/2005 identified the following area subject to flooding. Greenane near Kanturk. Historical recurring road flooding due to a drainage problem. This has been fixed recently. Flood ID 5154

Stakeholder Comments:

Residents Discussion 1 – Owners of Scully’s Stationary shop O’Brien Street

The owners remembered a very bad flood in 1980, when water entered the shop. Another flood occurred in 2008 that reached the back door, but did not enter the shop. Owners advised that the cleaning of the river channel is essential to minimising floods and that the river widening works downstream a few years ago was beneficial to mitigating flooding in the town. They advised that debris accumulating at the bridges particularly trees at the River Allow bridge is a big cause of flooding in the town.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

From the site visit, and the flood records, the flood risk outlines appear to under estimated west of the River Allow in the town and south of the town. Also a number of wedges in the ground model were noted north of the town. South of the town there appear to be a stray 10% AEP outline that should be trimmed.

Based on the site visit the PRFA outlines have been amended as shown in the map attached to this Site Inspection Report.

Receptor comments:

The amendment of the flood extent outlines has confirmed that approximately 100 residential/ commercial properties have been added to the flood extent area. This would lead to an increase in the residential fluvial FRI score of 1000 and increasing the total FRI score from 1099.6 to 2099.6.

Evidence of Flooding:

The soffit levels of the River Dalua six eyed masonry arch bridge (Main Street Bridge) in the town centre are approximately 2m higher than the approach road levels on O'Brien Street. The soffit levels of the River Allow five eyed masonry arch bridge (Greenane Bridge) in the town centre are approximately 1m higher than the Main Street Bridge soffit levels. A number of weirs have been installed on the rivers within the town. River widening works have been undertaken downstream of the town to accommodate larger downstream flows in the River Allow.



Upstream side of River Dalua Bridge (Main Street Bridge) in the town centre



Downstream side of River Allow Bridge (Greenane Bridge) in the town centre



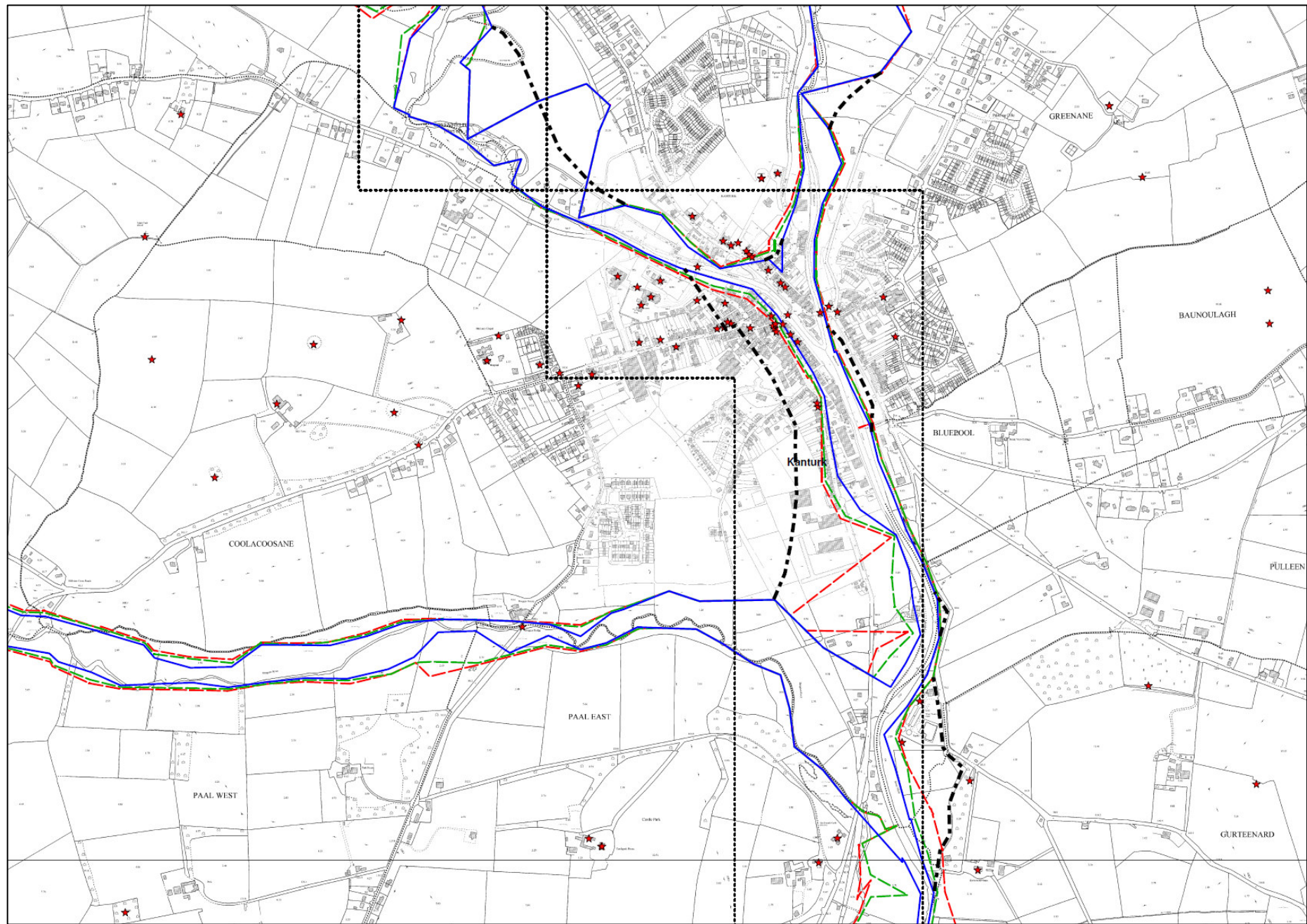
Looking north at the confluence of the Dalua with the River Allow.

Summary:

The site is an AFA because of the high number of properties at risk in and south of the town. The larger masonry piers in the rivers at the Greenane and Main Street Bridges in the town appear to aggravate flooding in the town due to debris accumulation upstream of the bridges.

Site Visit Findings:

AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kealkill	Hydrometric Area: 21	County: Cork
Unique OPW ID: 210311	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 14/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Low FRI Score. New LA Feedback <u>VAL COMMENT – R2</u> LA Requested RR <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R2</u> Requested Risk Review as score close. Fluvial flooding.		
Floodmaps.ie Information: The website contained no information in relation to flooding at Kealkill.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar and there appears to be no major anomalies such as wedges. However, the flood risk outlines contain what appears to be an outcrop section not a risk from flooding. The site visit did not identify any topographical reason		

for this outcrop. As such, the flood risk outlines have been modified to include this area and an additional 3 residential / commercial properties.

The flood outline along a tributary to the main Owvane River has also been modified based on the site visit.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Kealkill



Kealkill

Receptor Comments:

The removal of the outcrop section as discussed above has resulted in the inclusion of 3 residential / commercial properties. Modifications to the flood outline of a tributary to the Owvane River have resulted in the exclusion of approximately 6 residential / commercial properties.

From the site visit a low value monument (castle ruins) which was deemed at risk has been removed from the FRI score as it is elevated well above the river bank.

Evidence of Flooding:

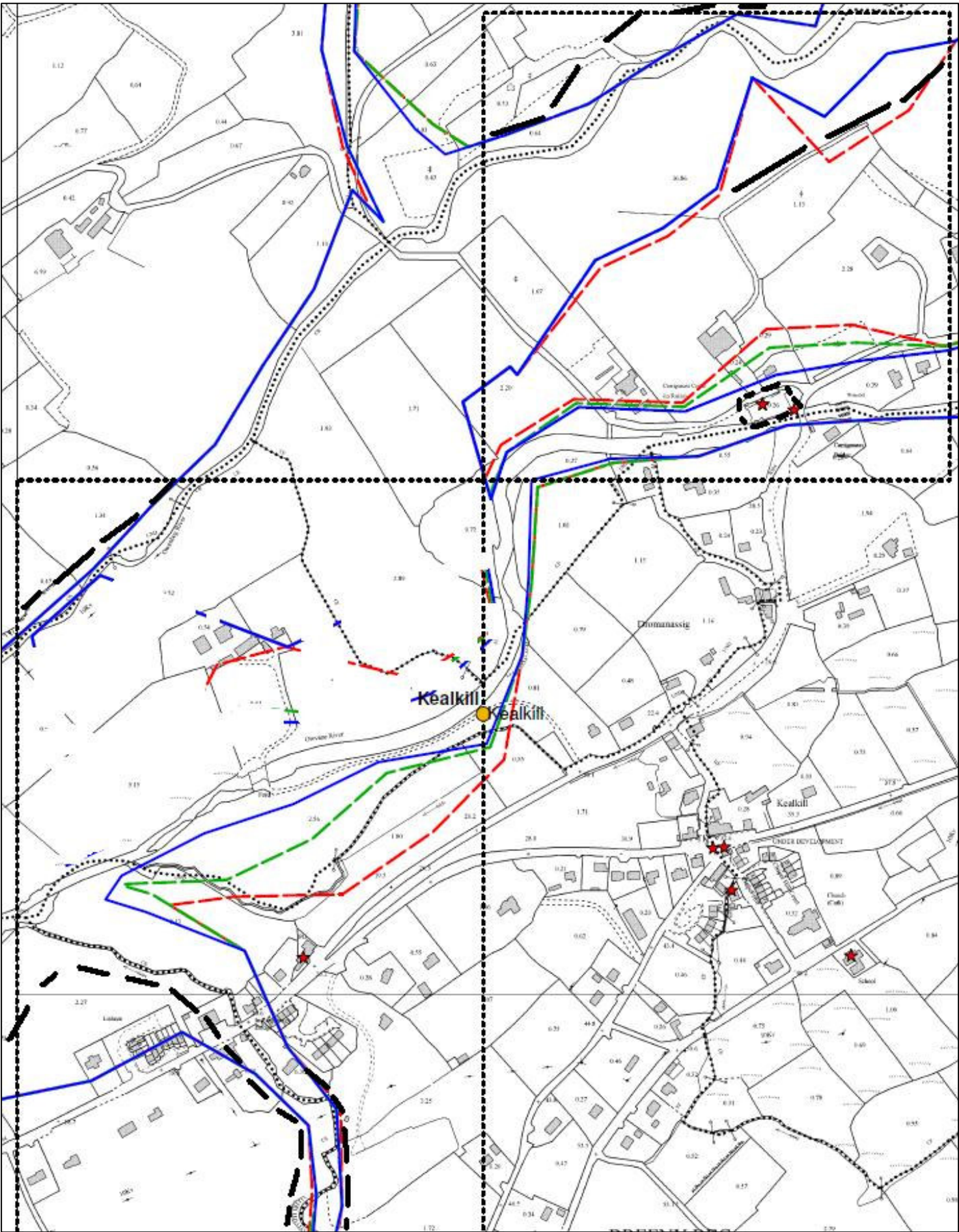
During the site visit there were no visible signs of flooding within the area.

Summary:

The fluvial flood risk outlines have been modified resulting in the inclusion and exclusion of various receptors. The initial FRI score (191) was below the threshold score. The revised FRI score (140) is still below the threshold score. Therefore, the site is not an AFA.

Site Visit Findings:

Not AFA.





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kenmare	Hydrometric Area: 21	County: Kerry
Unique OPW ID: 210312	Site Type: CAR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 12/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> 2008 severe bridge issues <u>VAL COMMENT – R1</u> Severe Bridge Issue – OPW Regional – Very High FRI Score <u>APP COMMENT – R1</u> Approved – APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contained a number of documents including minutes of meetings, newspaper clippings and one comprehensive report regarding a flood event in Kenmare Town on 23 rd October 2008. <u>Minutes (24/02/2006)</u> – the minutes contained on the website relate to a meeting between KCC and ESBI regarding source body data for the Kenmare area as part of the OPW Flood Hazard Mapping Phase 1 Project. The minutes identify 12 areas of flooding and provide Flood ID Numbers for each area. Not all areas are related to Kenmare Town and no specific dates are provided for the flood events. However, one event (Flood ID 4700) at Kenmare Town is identified as being a 1 in 10 year event and details are provided below: “1 Kenmare Town Square (Flood ID – 4700) Finnihy River flows through Kenmare and Caol na Gabhair stream meets the Finnihy at the town centre. During periods of heavy rainfall, high tides and westerly winds water backs up from the Kenmare river Estuary into the Finnihy and the stream causing the surface water system in the town square to back up. Water backs up gullies all around the square. Last time flooding occurred was c 1995/1996. Frequency is around 1 in 10 years. Between 10 and 20 properties		

need sandbagging. 2 to 3 commercial properties are flooded and a similar no of private houses are affected. Square and N71 are impassable.”

Report on Flooding on 23rd October 2008 – the report was prepared by KCC

“On the afternoon of the 23rd October 2008, a significant flood event occurred in Kenmare Town resulting in 37 properties being flooded including 11 commercial properties. This factual report was prepared following a request from the Office of Public Works who are the lead Government Agency for flood risk management in Ireland (under the Arterial Drainage Acts). The content of this report follows the guidance provided by the O.P.W. in the document Flood Data Collection, a copy of which is provided in Appendix A.”

Stakeholder Comments:

During discussions with staff at the Local Post-Primary School, they advised that the school has never been flooded, including during the 2008 flood. The biggest impact on the school due to flooding was access restrictions to and from the town for students due to flooding at the bridge.

The local Convent also advised that while flooding encroached on their garden, at no time was the building in danger. The building is raised and the garden slopes to the river bank.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

Overall the 10%, 1% and 0.1% AEP fluvial outlines appear reasonable and the outlines are similar. However, to the south of the town there is a 10% AEP fluvial outline wedge.

From the site visit it would appear that the 10% AEP outline wedge can be ignored / removed.

Ground levels along the west bank of the Kealnagower Stream, to the north of the town, suggest that the outlines here should be modified to a narrower outline. This results in the removal of a derelict commercial premise from the FRI.

The flood outlines of the Finnihy River to the north of the town appear to over estimate the flood risk in this area. The ground levels of houses along the road are significantly higher than the banks of the river and the Convent and Post Primary Schools have large gardens / areas around the buildings which slope to the river bank. Therefore, the outlines at these locations are also required to be modified to reflect the topography.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the attached map. No changes are recommended to the coastal outlines.



Kenmare



Kenmare – river runs through town adjacent to town square.

Receptor Comments:

The amendment of the fluvial flood risk outline has confirmed the removal of the Post Primary School, the Church and the Convent along with 19 Residential / Commercial properties. This leads to a reduction of approximately 440 from the Flood Risk Index total. However, this only reduces the FRI from 1391.67 to 951.67 which is still in excess of the threshold score.

Evidence of Flooding:

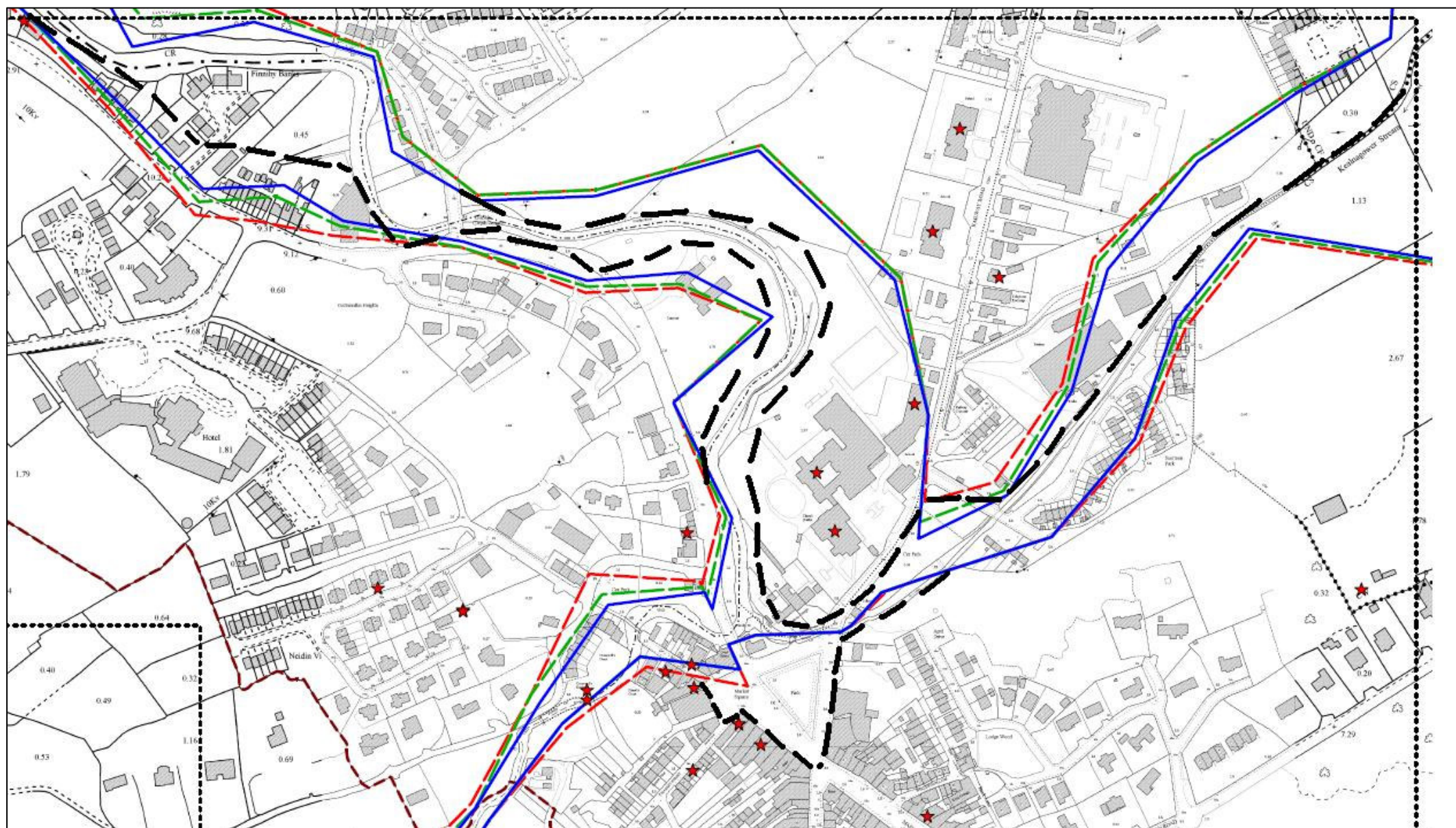
During the site visit localised flood defences such as sand bags were present at a number of properties in the housing estate across from the Post-Primary School.

Summary:

The Site is an AFA as well over 25 properties are within the 10% AEP outline. These properties have also flooded as recently as 2008.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kilcrohane	Hydrometric Area: 21	County: Cork
Unique OPW ID: 210313	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 15/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Health Centre, School and housing at possible risk <u>APP COMMENT – R1</u> Possible errors in predictive flood extents - Local Authority doubts over degree of risk - Risk Review - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> High score; high out of the sea <u>LA COMMENT – R2</u> No flooding		
Floodmaps.ie Information: The website contained no information in relation to flooding at Kilcrohane.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: Following the site visit it is apparent that the predicted flood risk outlines have been over estimated. The slope of the stream is steep with high banks. A number of houses are raised well above the stream and are not deemed to be at risk. Furthermore, the surrounding topography does not reflect the extent of the predicted outline. Based on the site visit the PRFA fluvial outlines in this area have been amended		

as shown in the map attached to this Site Inspection Report.



Kilcrohane – view of bridge and river adjacent to town.



Kilcrohane – culvert downstream of village.

Receptor Comments:

As mentioned above, the predicted flood risk outlines were overestimated. The initial FRI score for Kilcrohane was 848. However, based on the site visit and the modifications to the flood risk outlines 14 residential properties and 1 commercial property were identified as at risk. This results in a revised FRI score of 150 which is below the threshold score. Therefore, the site is not an AFA.

Evidence of Flooding:

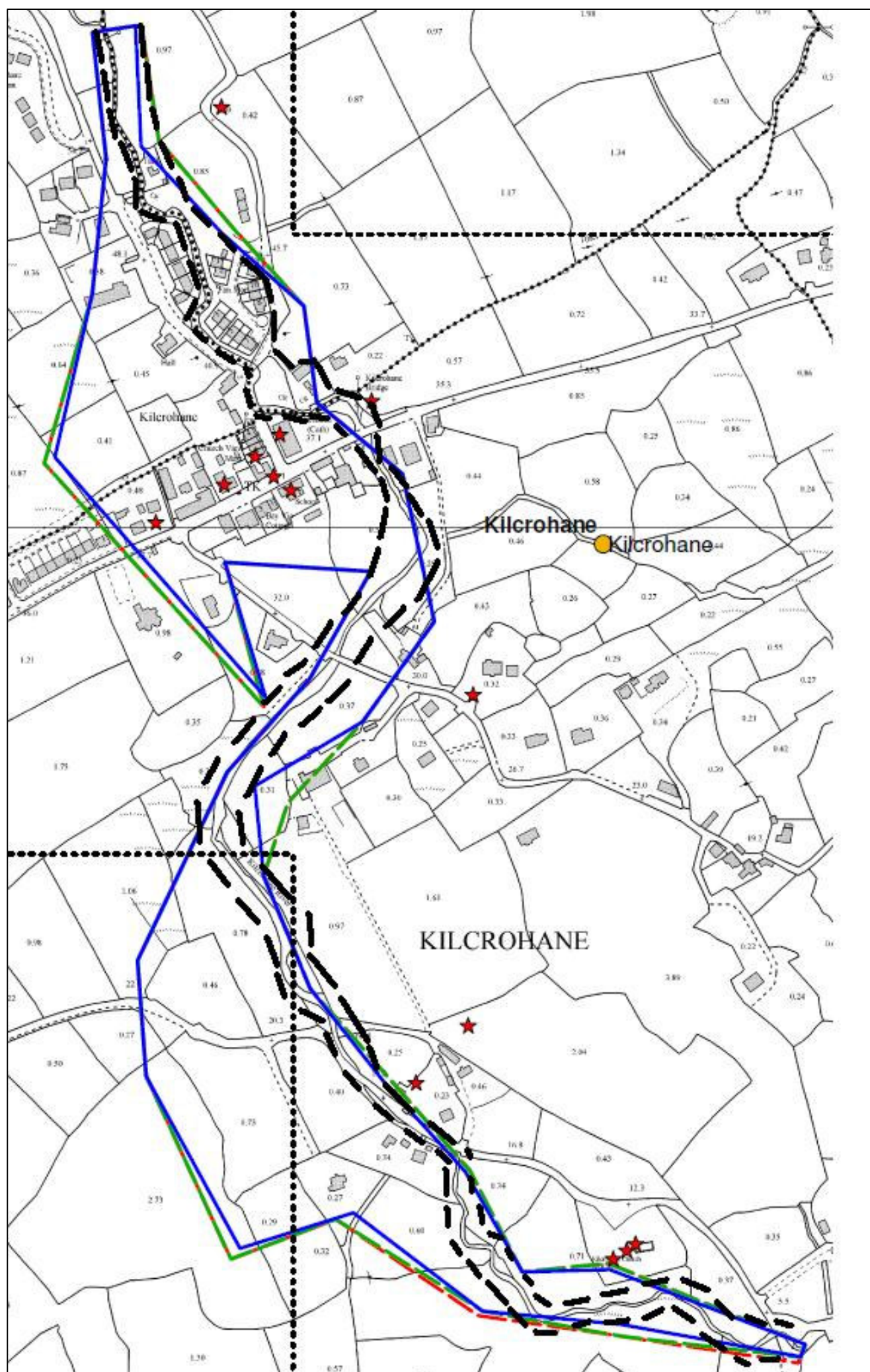
During the site visit there were no visible signs of flooding within the area. The Principal at the local Primary School advised that they have experienced no flooding during the past 14 years of her tenure and have no records of any events prior to this.

Summary:

The fluvial flood risk outlines have been modified. 15 residential / commercial properties are deemed to be at risk. However, the FRI score is below the threshold score. Therefore, the site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kilfarnoge	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220336	Site Type: ARR	Source of Flooding: Coastal/Tidal
Surveyor: David Murphy	Date: 08/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> Just meets requirements with combined Monument and Residential Holiday village at coast. <u>VAL COMMENT - R1:</u> No History of serious flooding. <u>APP COMMENT R1:</u> Doubts over flood extents - Risk Review - Not an APSR.		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> Tidal Though this area is coastal and low lying there is no history of serious flooding.		
Floodmaps.ie Information: The website does not contain any record of historical flooding at this location.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The 10% AEP outline generally matches the 1% and 0.1% AEP outlines used in the PFRA analysis. From site inspection, this would appear to be accurate since the flood outlines generally follow the line where the beach/shore meets dry land embankments. Dry land is typically >2m higher than the beach area and observed sea water levels as shown in the photo below.		



Typical difference in level along shoreline

Following the site visit, it is not proposed to alter the PFRA outlines in this area.

Receptor Comments:

Although this receptor has notable commercial (13.7) and residential (137) flood risk indices, no such properties were observed to be located in a flood risk zone.

Approximately 70 mobile/holiday homes are located in the north west corner of the Risk Review (RR) area (see photos below). These are not recorded on OSI mapping but are visible on ortho-photographs and may account for the high com/res index.



Holiday homes located at Kilfarnoge

These appear to be above outside the 10%, 1% and 0.1% flood outlines and it is recommended that the index is reduced to reflect this.

In addition, the RR area was attributed an FRI of 100 for the low value monument category. This seems to coincide with 10 monuments mapped in close proximity to the PFRA flood lines. Confirmation of this on site was not possible due to access restrictions. However, from comparing the PFRA maps, ortho-photos and national monument database, it would appear that 5 of these in the south west corner of the RR area are outside the PFRA flood lines. Removing these would reduce this index by 50.

It is worth noting that over an extended period of time, some receptors may be affected by erosion. However, since many of these are “mobile”, the risk could be easily reduced through relocation.

Evidence of Flooding:

No evidence of flooding observed.

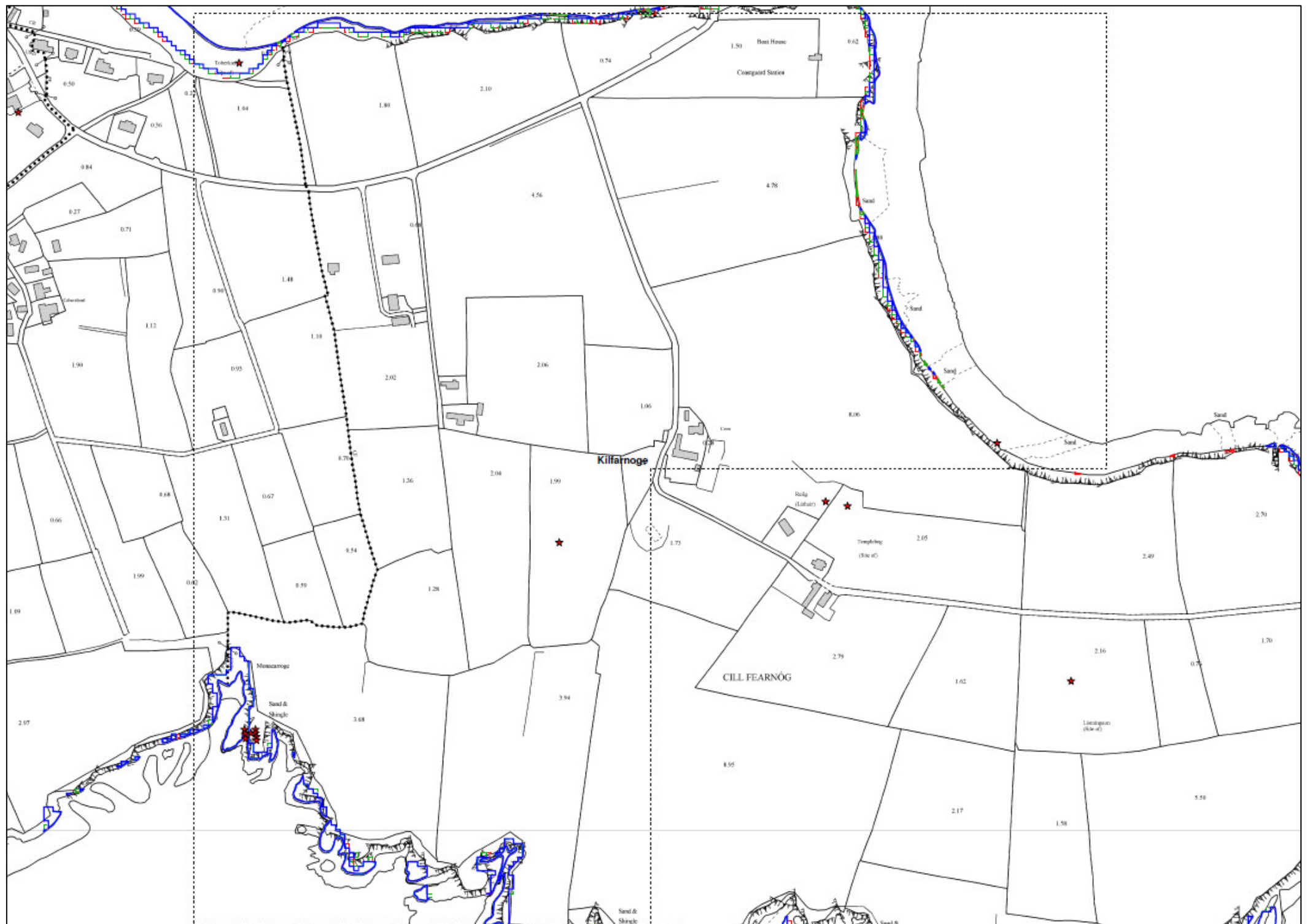
Agricultural land is separated from beach/shore level in much of this area by rock or earth embankments, typically >2m high. The embankments are natural (as opposed to man made of flood defence purposes) and the high water levels and debris line indicate that the sea level does not affect agricultural land or properties in the areas.

Summary:

It is estimated that no residential or commercial properties are at risk and that the index associated with monuments should be reduced. Since the current PFRA index is barely over the threshold, these reductions would bring the index well below the threshold for further assessment.

Site Visit Findings:

Not AFA.





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Killarney	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220337	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Barry O'Connor	Date: 9/12/2011	
OPW PFRA Comments: localised occasional		
LA Feedback Comments: None		
Floodmaps.ie Information: No record of flooding to properties		
Stakeholder Comments: A resident of Ferndale Avenue states that this estate has not flooded since he moved there in 1986. This area is shown under the 10 year outline. A 1 in 12 year flood was recorded in the River Flesk in November 2009. I would have to question the outline at this point. The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: Outlines for Flesk seem too high. Outline for Deenagh river upstream of the Tralee Road is underestimated. The revised flood outline for Killarney is attached to this report.		
Receptor Comments: Receptors along the Flesk should be removed and residential receptors at the Deenagh should be added.		



The River Deenagh next to the Port Road.

Evidence of Flooding:

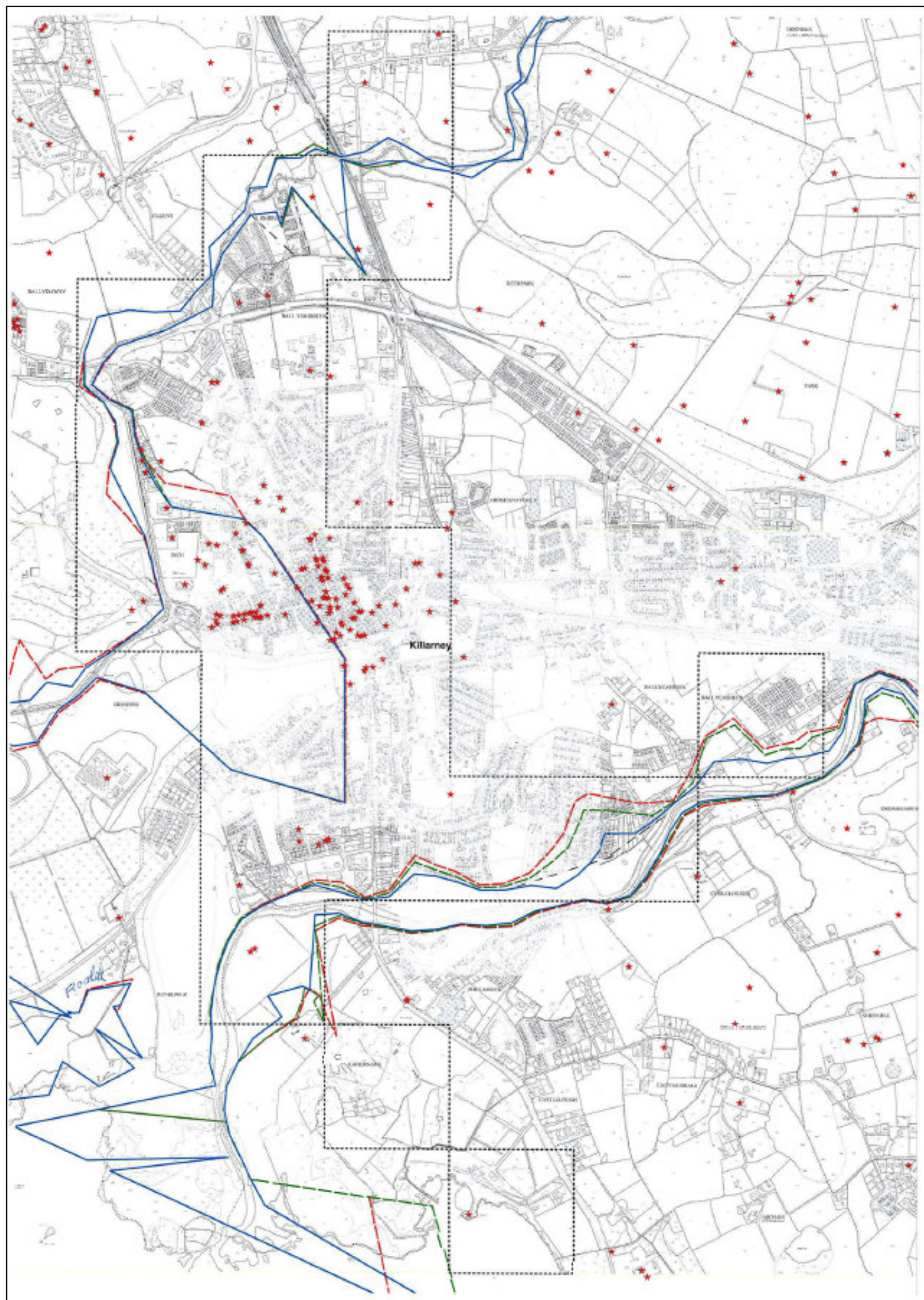
None. Perhaps the Mission road was raised to prevent flooding the centre of the town.

Summary:

The site is an AFA because it would appear that a large area of the town is at risk of flooding from the Deenagh River. The flood extents shown at the River Flesk are too extensive. A review of the flow records at Flesk Bridge would indicate that the peak flow encountered in November 2009 of 213m³/s had a return period of 12 years. The PFRA calculated that the 1 in 10 year peak flow here was 272m³/s. This is an overestimate.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Killavullen	Hydrometric Area: 18	County: Cork.
Unique OPW ID: 180256	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 9/12/2011	

OPW PFRA Comments:

VAL COMMENT – R1

Wedges in Model, Local Authority Feedback includes reference to Liffey ?
Low Historic Risk and Hazard

APP COMMENT – R1

Possible errors in predictive flood extents - Risk Review - Not an APSR

APP COMMENT – R2

Site visit to Killavullen indicates flood extents from Ross River over-predicted at upper end of village, but some properties potentially at risk - Needs Risk Review to confirm status

LA Feedback Comments:

LA COMMENT – R1

Road Flooding Historical Events Liffey – few hundred metres from built up area at village. Small Village – Small growth centre

LA COMMENT – R2

Health Centre in flood zone driving up index. Check what records of previous flood events. Has health centre been affected by flooding? Houses flooded?

Floodmaps.ie information:

Nine flood events recorded on website:

1. Flooding at Killavullen, Mallow, Co Cork November 2009
2. Blackwater Munster Killavullen 6th August 1986
3. Munster Blackwater Killavullen November 2000
4. Blackwater downstream Killavullen Bridge recurring Flood ID 5114
5. Blackwater Ross Street Killavullen recurring Flood ID 5115
6. Blackwater Monanimy Lower recurring
7. N72 at Monanimy Cross recurring Flood ID 5112
8. L1500 at Ballincurrag Recurring Flood ID 5095
9. Moanimy Upper N72 recurring

Eight of these flood event records are within the risk review area on the

overview map.

Flood Event 1:

This event started on Wednesday 18th November 2009 and ended on Sunday 22nd November 2009. The peak flood in Killavullen occurred at 2.30 on Friday 20th November. The flooding occurred due to high rainfall in the Munster Blackwater catchment, on the River Blackwater. The maximum flood level (metres OD Malin) was 40m. It was noted that flooding has occurred at this location before, occasionally. Residential houses to the north of the river, 50m of the N72 national secondary road and 1,150m of the L-1226, L-1227 & L-5406 were affected by the flooding event (*typo in flood report "south of river" was noted in report, but the N72 road is north of the river and the attached flood extent map indicated areas north of the river*).

Flood Event 2:

On Wednesday 6th August 1986, a flood level in the OPW Killavullen Gauging Station was recorded with the staff gauge reading of approximately 5.46m. Flood marks indicated that the flood had crossed the road on the Fermoy side (east side) of the gauging station.

Flood Event 3:

Aerial photographs taken of a flood in Killavullen on 6th November 2000, in which the Killavullen bridge and roads north of the river are flooded. The source of the flood appeared to be the River Blackwater.

Also included in the event record was the Fermoy Drainage Scheme Hydrology report (April 2003). In the report, the Killavullen Gauging Station maximum yearly records from 1955 to 2000 were included. On 1st December 2000 a level of 41.18m (OD Poolbeg) was recorded. Also, it was noted that there was an unusually high flood level (42.4m OD Poolbeg) at the Killavullen Gauging Station on the 2nd November 1980.

Flood Event 4:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. County road flooding due to River Blackwater Downstream Killavullen Bridge – recurring Flood ID 5114.

Flood Event 5:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. Houses flood on either side of Ross Street Killavullen during periods of high flow in stream and River Blackwater. Some alleviation works carried out to date. Flood ID 5115.

Flood Event 6:

Reference made to minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. The flood event title, recurring flooding at Blackwater Monanimy Lower was not noted in the minutes. However, refer to Flood Event 7 & Flood

ID 5112.

Flood Event 7:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. Road flooding on N72 at Monanimy cross roads River Blackwater and Stream – recurring Flood ID 5112.

Flood Event 9:

Reference made to minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. The flood event title, recurring flooding at Blackwater Monanimy Lower was not noted in the minutes. However, refer to Flood Event 7 & Flood ID 5112.

Stakeholder Comments:

Contacted the Cork County Council Area Engineer 12/12/2011. The Area Engineer asked for a copy of the draft flood maps for review.

Contact was made with a local resident in the area and description of the flooding history was recorded.

Residents Discussion 1 – Owner of O'Regan's Convenience Store:

The shop is located on the section of the Ross Road south of the Church and west of the National School. In a discussion with the owner, she noted that the Ross Road, the National School or the houses in the Nano Nagle Place housing estate have never flooded.

Predictive PFRA Flood Outline:

South of the village the fluvial flood risk is dependant on the Ross River. From the site visit it would appear that the flood extent outlines are exaggerated southwest of the village. It was noted that the lower sections of Ross Street (between Ross Bridge and Main Street) do appear to be susceptible to flooding from the Ross River.

From the site visit and the flood event records, it would appear that the flood extent outline is underestimated in some areas along the local road north of the river.

Based on the site visit the PRFA flood extent outlines have been amended as shown in the map attached to this Site Inspection Report.

Receptor Comments:

The number of residential and commercial properties within the flood extent outlines appear to be overestimated. The amendment of the flood extent outline has confirmed that only 12 residential/commercial premises are within the 10% AEP. This would lead to a total in the residential and commercial

fluvial flow risk index of 120 and would reduce the total FRI score from 573 to 192.

During the site visit, it was noted that the position of the listed historic building (ID 20812009) on the west side of Ross Street should indicate the building north of the house currently indicated. The building currently highlighted on the attached map as the listed building on Ross Street has now been replaced with four new town houses, but the listing building remains to the north.

Evidence of Flooding:

The houses on the lower sections of Ross Street (between Ross Bridge and Main Street) have raised threshold entrances with either 2 steps or ramps lifting the thresholds above footpath level.



Ross Street - four new houses with raised threshold.

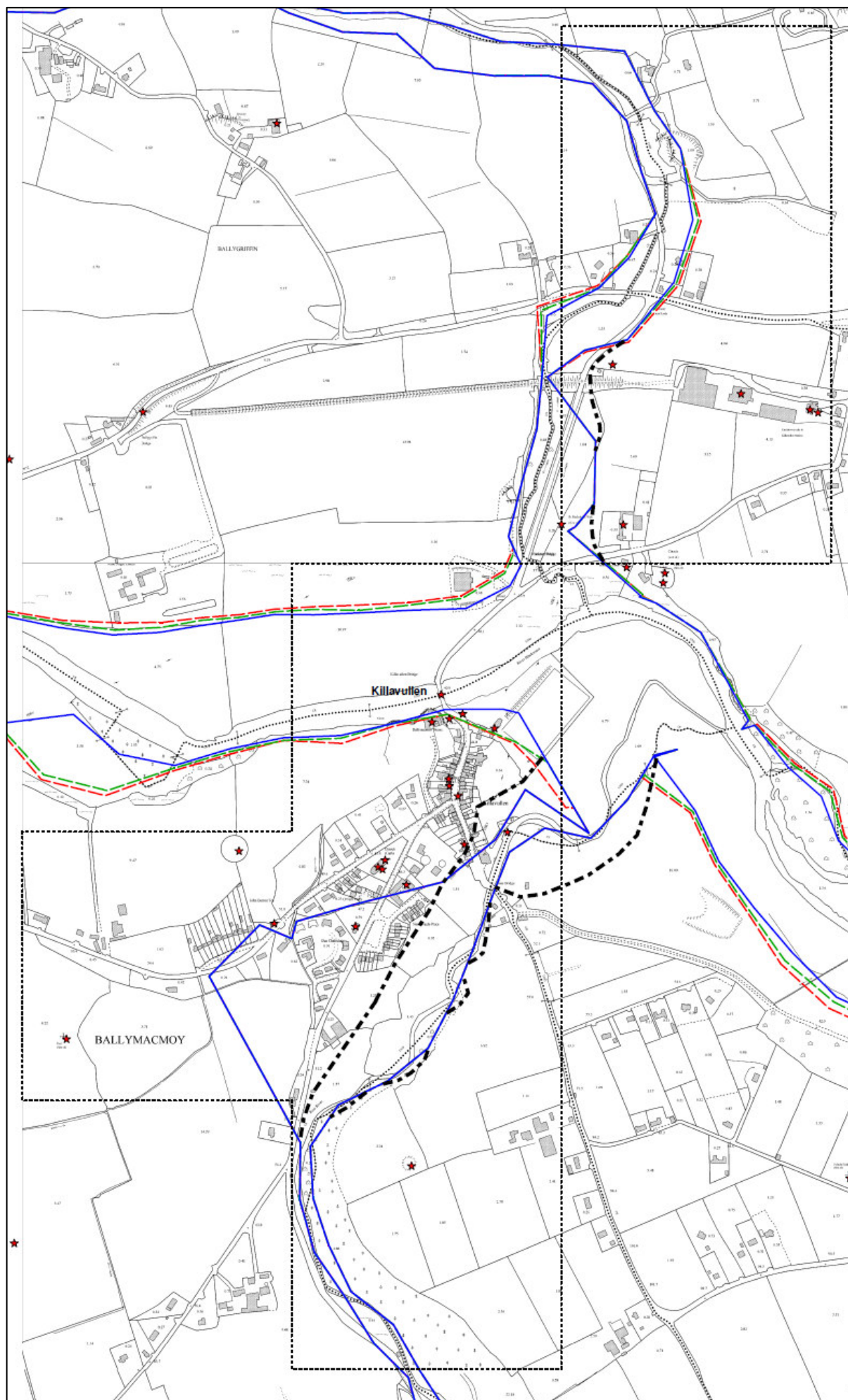
The road on the Killavullen Bridge (over the River Blackwater) and the road north of the river from the village appear to be flood damaged with continual repairs to the road surfacing evident.

Summary:

This site is not an AFA because the in the flood risk to properties in the village is low. The majors effect flooding has in Killavullen is on the road over the River Blackwater and the roads north of the river, especially the N72 national secondary road at Monanimy crossroads.

Site Visit Findings:

Not AFA.



Revised Flood Boundary



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Killeagh	Hydrometric Area: 19	County: Cork.
Unique OPW ID: 190274	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 08/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> FRI Score > 250, No concerns expressed by LA or OPW Region- Large wedge in model for 1000 year outline in Village of Killeagh. <u>VAL COMMENT – R2</u> LA requested RR. <u>APP COMMENT – R1</u> Errors in predictive flood extent - Not an APSR. <u>APP COMMENT – R2</u> FRI = 316, but errors in mapping - Not covered by Lee CFRAM - Include for Risk. Review to confirm status.		
LA Feedback Comments: <u>LA COMMENT – R2</u> Needs Risk Review – See flood extents generated by JBA for Development Plan.		
Floodmaps.ie Information: One flood event is recorded on the Floodmaps.ie website for Killeagh. 1. Flood Event: Garranejames, Killeagh, Co. Cork. 19th Nov 2009 It is noted however that the flood event record is not located within the risk review area on the overview map for Killeagh. The source of the flood waters was a runoff (and the cause was surface water drainage). The flooding occurred in the Dower/Womanagh catchment. 300m of the local road L7836 and some pasture lands were flooded.		
Stakeholder Comments: A member of staff at the Thatch Pub and Restaurant which is located adjacent		

to the bridge over the Dissour River in Killeagh stated that she had no recollection of any flooding to the premises. From discussion with a long term resident of Killeagh he confirmed that in his living memory there was no fluvial flooding in the village of Killeagh. He also stated that he can only remember the flood level of the river only ever reaching the eyes of the bridge and never overflowing.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The 0.1% AEP outlines between the Dissour River and the river/stream to the east of the village in the vicinity of the N25 National Road and Railway line are not representative of the local topography. The amendments to these outlines do not result in the removal of any residential or commercial properties from the Flood Risk Index (FRI).

From the site visit it would appear that there are also errors in the 10% AEP outline south of the village of Killeagh which removes a total of 10 residential and commercial properties from the FRI. The 0.1% AEP outline between the N25 National Road and Woodview housing estate also appears to be overestimating flood risk in this area. This removes a further 2 residential and commercial properties from the FRI.

North of the village on the western side of the Dissour River in the vicinity of the Glenbower Wood further amendments to the 10% AEP outline is required. From these amendments 7 recently constructed residential properties (not shown on the outline map) have to be included the FRI score.

Based on the site visit the PFRA outlines for Killeagh have been amended as shown in the attached map.



South Side of bridge in Killeagh - Dissour River



Dissour River – North Side of Bridge

Receptor Comments:

The Primary School and Garda Station in Killeagh are not within the PFRA outlines and they are not at risk of flooding from the Dissour River. The Primary School and Garda Station attributed 2.5 and 0.25 points respectively to the PFRA score. Since both of these lie outside the risk outlines it is recommended that they be removed from the Flood Risk Index (FRI) total score.

Adjusting the 10% AEP flood outlines south of the village, based on the site visit removes a total of 10 residential and commercial properties from the FRI. The total reduction of residential and commercial receptors in this area reduces the score by a maximum of 100.

The removal of the 2 residential and commercial properties between the N25 National Road and Woodview housing estate reduces the FRI score by 0.2

The inclusion the 7 recently constructed residential properties north of the village within the 10% AEP outline resulted in the FRI score increased by 70.

The overall amendments of the flood extent outlines and removal of the Primary School and Garda Station has lead to a reduction of 32.95 points from the total FRI score. This reduces the FRI score from 316.35 to 283.4.

Evidence of Flooding:

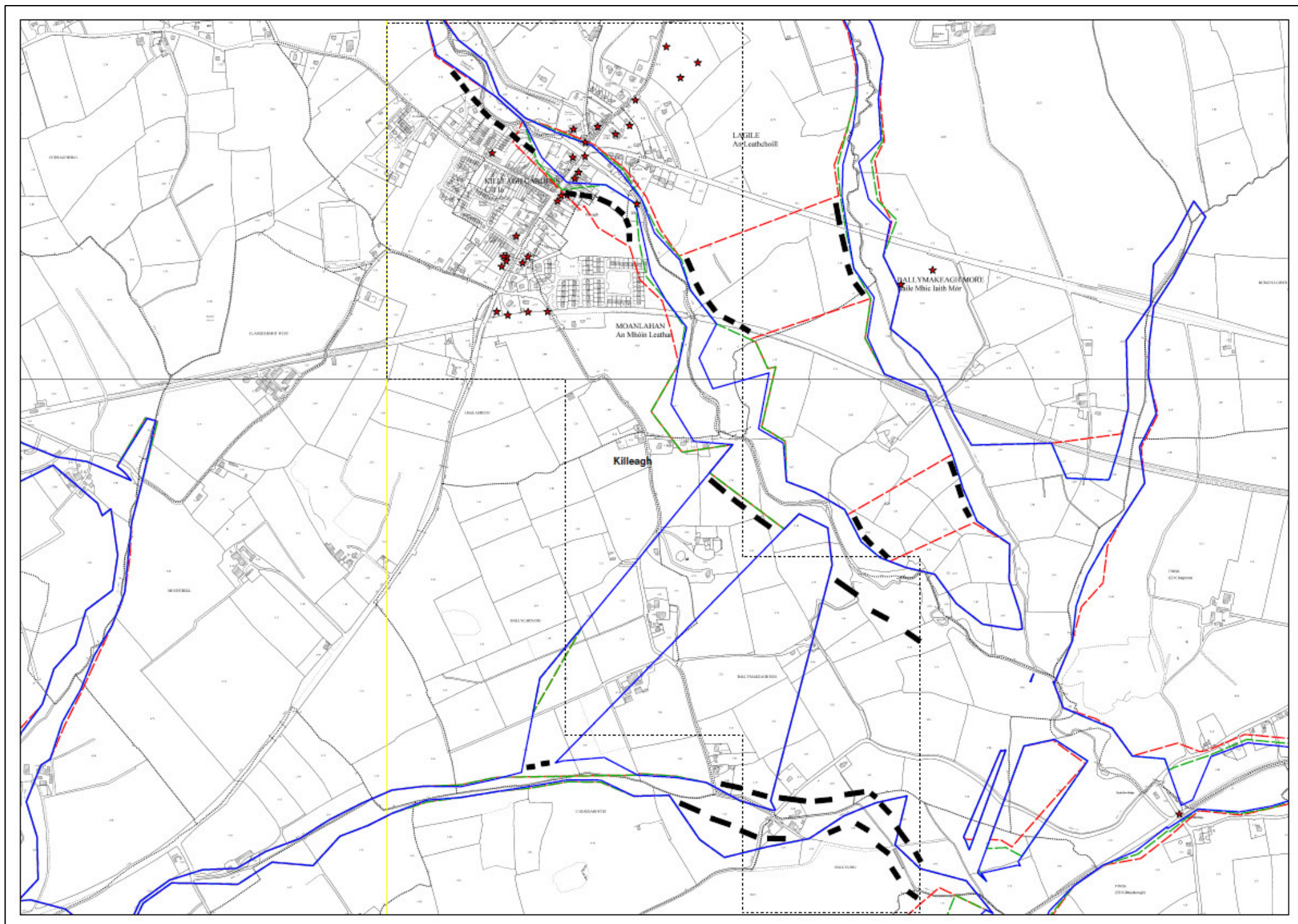
From the site visit there appeared to be no evidence of fluvial flooding anywhere within the risk review area for Killeagh.

Summary:

The site is an AFA as it would appear that over 25 residential / commercial properties are at risk from flooding from the river. It is noted however that even though the FRI score is above the 250 threshold, making it an AFA, it is noted that no history of fluvial flooding has been recorded for Killeagh.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Kilorglin	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220338	Site Type: CAR	Source of Flooding: Fluvial & Tidal
Surveyor: David Murphy	Date: 13/12/2011	
<p>OPW PFRA Comments:</p> <p><u>VAL COMMENT - R1:</u> High FRI Score.</p> <p><u>VAL COMMENT – R2:</u> LA are not aware of any risk. Reduce to RR?</p> <p><u>APP COMMENT R1:</u> Approved – APSR.</p> <p><u>APP COMMENT R2:</u> FRI = 1609, with some possible errors outside of town, but seems reasonable within town extents - Maintain as APSR, and Risk Review (as required for all APSRs) can confirm risk status.</p>		
<p>LA Feedback Comments:</p> <p><u>LA COMMENT ROUND 1:</u> LA are not aware of any particular flood risk in the town itself. Some flooding does take place at Steelroe about 2km North East of the town.</p> <p><u>LA COMMENT ROUND 2:</u> No knowledge of history of flooding.</p>		
<p>Floodmaps.ie Information:</p> <p>The website does not contain any records of historical flooding at locations within the risk review area.</p> <p>However, there is a report detailing a recurring flood event on the N70 near Steelroe. This occurs for combinations of storm events with high tides approximately once every 10 years.</p> <p>In addition, some land commission areas are identified south east of the town in review area – these correspond with areas of land protected by embankments which were observed during the site visit.</p>		

Stakeholder Comment:

Enquiries were made with various local people in relation to flooding in the area:

In relation to the houses in the south east of the risk review (RR) area, one of the residents advised that these homes were not affected by flooding (Cotteners River).

Enquiries were also made at the filling station and the fishery (near wool mill) on the east bank of the River Laune. Staff at the filling station were unaware of any flooding issues while staff at the fishery (lower level, shown in photo below) advised that the car park and building flooded occasionally during combinations of high tides and flows. The individual was of the opinion that the problem was related to a build up of material in the river channel and that maintenance works were needed.



**Woollen mill & fishery susceptible to flooding
(East bank, downstream of N70 bridge)**

Two people were consulted in relation to flooding in the town on the west bank. A staff member at the B&B beside the River Laune bridge (N70, downstream side) advised that high river levels did not affect him. He advised that flood waters had once entered lower levels of the building through a field at the back but the local authority had carried out works to defend a nearby pumping station and these seemed to have solved the problem. He also advised that some of the lower lying properties at the upstream side of the bridge were historically susceptible to flooding - these are shown the photo

below.

A second individual advised that houses along the west river bank, north of the B&B and bridge (downstream) were not affected by flooding.

The Local Authority had no specific issues in relation to this site.



Properties upstream of bridge (west bank) which are historically susceptible to flooding

Predictive PFRA Flood Outline:

The 10% fluvial flood outline is not indicated for the main river channel. The 1% and 0.1% outlines vary and there are no indications that these need to be altered except for some minor amendments at the convergence point with the tributary in the south east of the RR area.

The boundaries relating to the eastern tributary stream appear to be significantly over estimated. This stream has been culverted through most of the town and from discussions with locals, this does not appear to flood and it is proposed that the outlines are altered to reflect this.

No changes are proposed for the tidal flood boundaries since these appear to accurately reflect the topography in the area.

Proposed changes to the fluvial flood risk outlines are indicated on the attached map, including an estimate of the 10% AEP fluvial boundary for the River Laune.

Receptor Comments:

The revised flood boundaries will result in approximately 43 commercial / residential properties being excluded from the flood risk index in addition to a school, telecoms exchange, a church, a health centre and a number of monuments.

Excluding these reduced the index from 1608 to approximately 863. This index is still quite high and does not seem to reflect the expected risk (lower end of scale) from the site visit.

This may have something to do with the missing 10% AEP for the main river channel or possibly a geo directory issue where multiple properties exist but a reduction representative of may only have been deducted e.g. a block of flats.

In an effort to establish a more reliable flood risk index for the area, a property count was undertaken which indicated that approximately 5 residential / commercial properties are affected by the 10% AEP in addition to a number of others (~15 + sewage pumping station) affected by the 1% AEP outline. This results in an index of approximately 90 which is thought to be more representative of the risk in this area.

Evidence of Flooding:

No evidence of flooding noted. High water marks are evident for much of the river side area but these appear to be indicative of normal high water levels as opposed to extreme events.

In general, no indications of bank over topping were observed.

Some embankments were noted on the river bank south of the town which coincide with the land commission areas indicated on the flood maps website.

Summary:

It appears that the model has overestimated the flood risk in some locations in this RR area and observations and discussions on site have resulted in a reduction in the flood risk index.

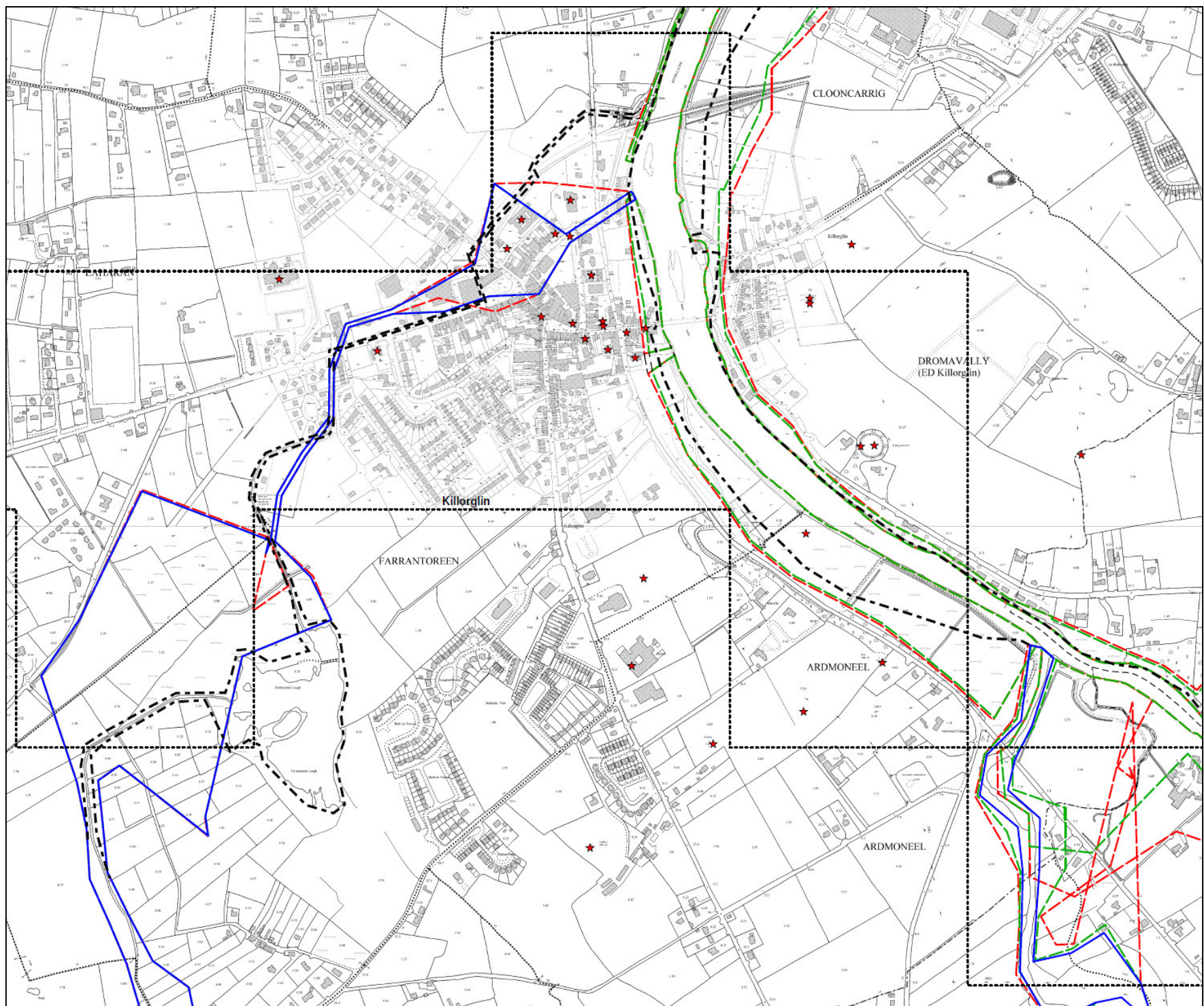
However, due to the risk index still being higher than expected, a property count was conducted which indicated an index below the threshold for further assessment.

The lower index is closer to what was expected after visiting the site and obtaining feedback from locals and hence it is proposed that this area is deemed not to require further assessment.

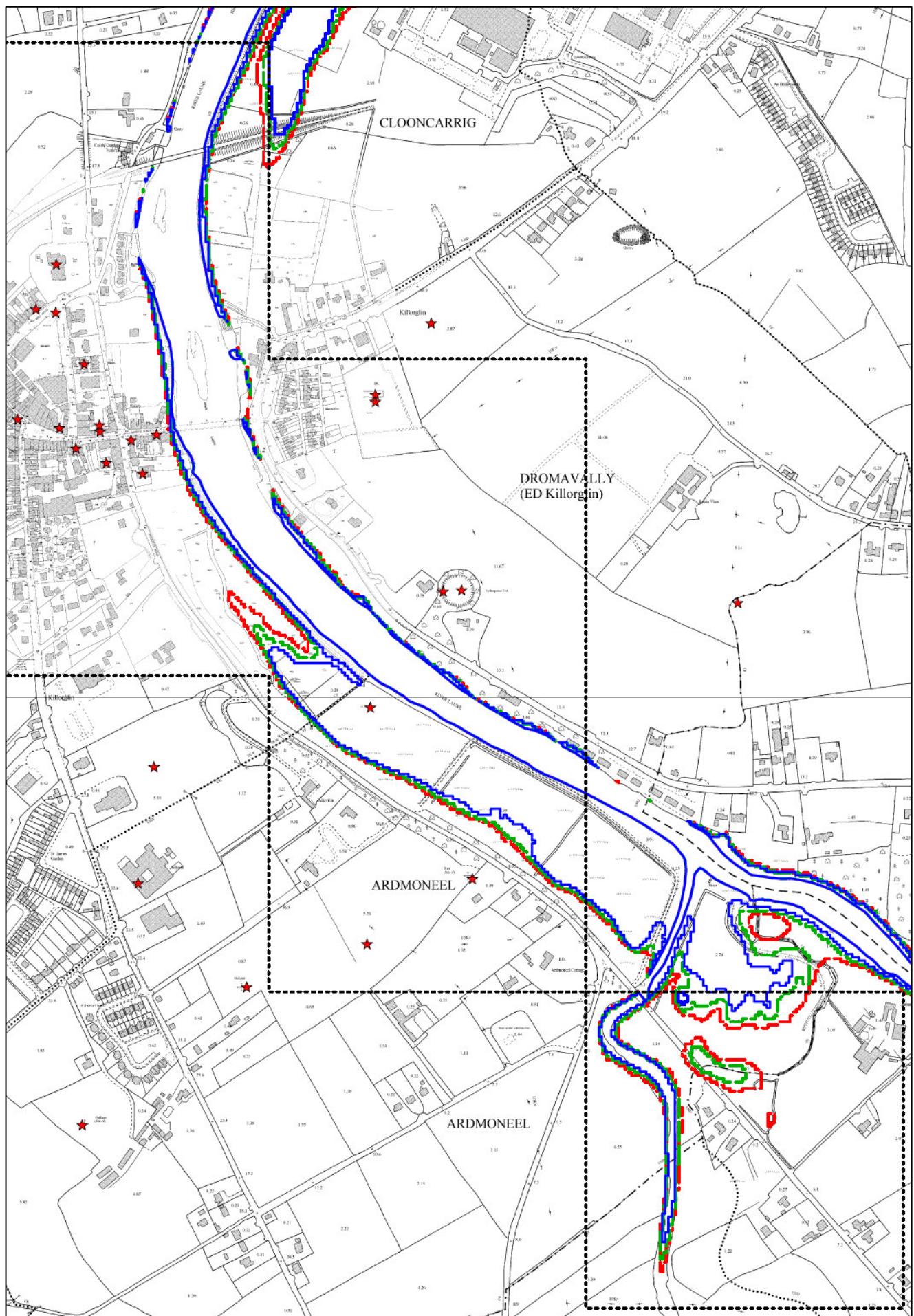
It should be noted though that some properties adjacent to the river bank near the N70 bridge do flood and these would benefit from localised defence or channel improvement works.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -



Tidal boundaries (No changes proposed)

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ladysbridge	Hydrometric Area: 19	County: Cork.
Unique OPW ID: 190275	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 08/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> FRI Score < 250, No concerns expressed by LA or OPW Region <u>VAL COMMENT – R2</u> LA requested RR at second workshop. <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> FRI = 173 - Not covered by Lee CFRAM - Include for Risk Review to confirm status		
LA Feedback Comments: <u>LA COMMENT – R2</u> Development Plan extents shows flooding. Drainage District in the area. Requested Risk Review.		
Floodmaps.ie Information: Two flood events are recorded on the Floodmaps.ie website for Ladysbridge. 1. Flood Event: Castlemartyr, Midleton, Co. Cork 19th November 2009 2. Flood Event: Castlemartyr, Co. Cork Recurring. (Flood ID 2209) It is noted however that both of the above flood event records are not located within the risk review area on the overview map for Ladysbridge. Both of these flood events occurred in the nearby village of Castlemartyr. <u>Flood Event 1:</u> The peak flood occurred on Thursday 19 th November 2009. The source of the flood waters was a river (and the cause was channel overtopping). The flooding occurred in the Womanagh catchment, on the Kiltha River. The maximum flood level (metres OD Malin) was 9.75m with a flood depth (metres) of 0.25m. Three		

residential properties were affected by the flooding event and 100m of the local road L3805 was flooded. Some pasture lands were also flooded.

Flood Event 2: (Flood ID 2209)

Minutes of a meeting with Cork County Council Area Engineer for Youghal Area on 20/04/2005 identified the following area subject to flooding.

Castlemartyr flooding problem at Bridge, capacity problem, properties on the right hand side have been effected in past, approximately frequently of once every two years – recurring. (Flood ID 2209).

Stakeholder Comments:

Cork County Council personnel interviewed were not aware of fluvial flooding in the area of the overview map for Ladysbridge. The following is noted:

During discussions with a number of Local Authority Engineers, they noted no history of fluvial flooding within the area of Ladysbridge. The Local Authority confirmed that in the past no fluvial flooding had affected the Cork County Council Ladysbridge Waste Water Treatment Plant adjacent to the Womanagh River. The Local Authority did state however that isolated localized pluvial flooding had occur in the village of Ladysbridge during times of very heavy rainfall associated with gullies and culverts. The Local Authority Engineers did confirm that fluvial flooding does occur on the Kiltha River in the nearby village of Castlemartyr.

During discussions with a local resident from Ladysbridge, he stated that he did not recall any fluvial flooding occurring in Ladysbridge. However he did mention that flooding occurred in the nearby village of Castlemartyr. A Postman also confirmed that fluvial flooding does not occur in the area however he stated that during times of very heavy rainfall part of the village does experience flooding from surface rainwater flowing down from the Cloyne road.

Predictive PFRA Flood Outline:

From the site visit it would appear that minor amendments are required to the river flood outlines which appear to be overestimating flood risk in certain areas of Ladysbridge.

Based on the site visit the PFRA outlines for Ladysbridge have been amended as shown in the attached map.



Womanagh River – Bridge in Ladysbridge looking upstream.

Receptor Comments:

The threshold levels of a number of houses in the large housing estate downstream of Ladysbridge were measured relative to the road levels indicated on the OS town plan. During this survey the bed level and rough cross sectional area of the channel of the Womanagh were also measured. The threshold levels vary between 8.0m and 7.5m above the datum. Three older bungalows at the rivers edge were measured as having threshold levels at approximately 7.3m. The river bed is approximately 4.7m wide and has steeply sided banks. An existing embankment on the right bank of the river Womanagh varies in level from 8.2m to 9.0m while the ground level on the land side of the bank is approximately 7.5m. If it is assumed that the slope of the river bed is between 0.1m and 0.075m per 100m and the channel is rectangular in section then the in bank capacity of the channel is between 14m³/s and 21m³/s if the embankments are ignored. The Q10 and Q100 values used in the PFRA were 17.19m³/s and 24.59m³/s respectively. This would indicate that some flooding of the housing estate could be expected during a 1 in 10 year flood event. This is consistent with the PFRA flood outlines.

The minor changes to the flood outlines do not affected the over all Flood Risk Index (FRI) for Ladysbridge. It is noted that a Cork County Council Waste Water Treatment Plant is located within the 10% AEP outline however no score has been included in the PFRA FRI score. This Waste Water Treatment Plant increases the score by a maximum of 25. Even with the inclusion of the 25 points for the Waste Water Treatment Plant, the Flood Risk Index (FRI) total score for Ladysbridge would be 197.6 which is below the 250 threshold to making it an AFA.

Evidence of Flooding:

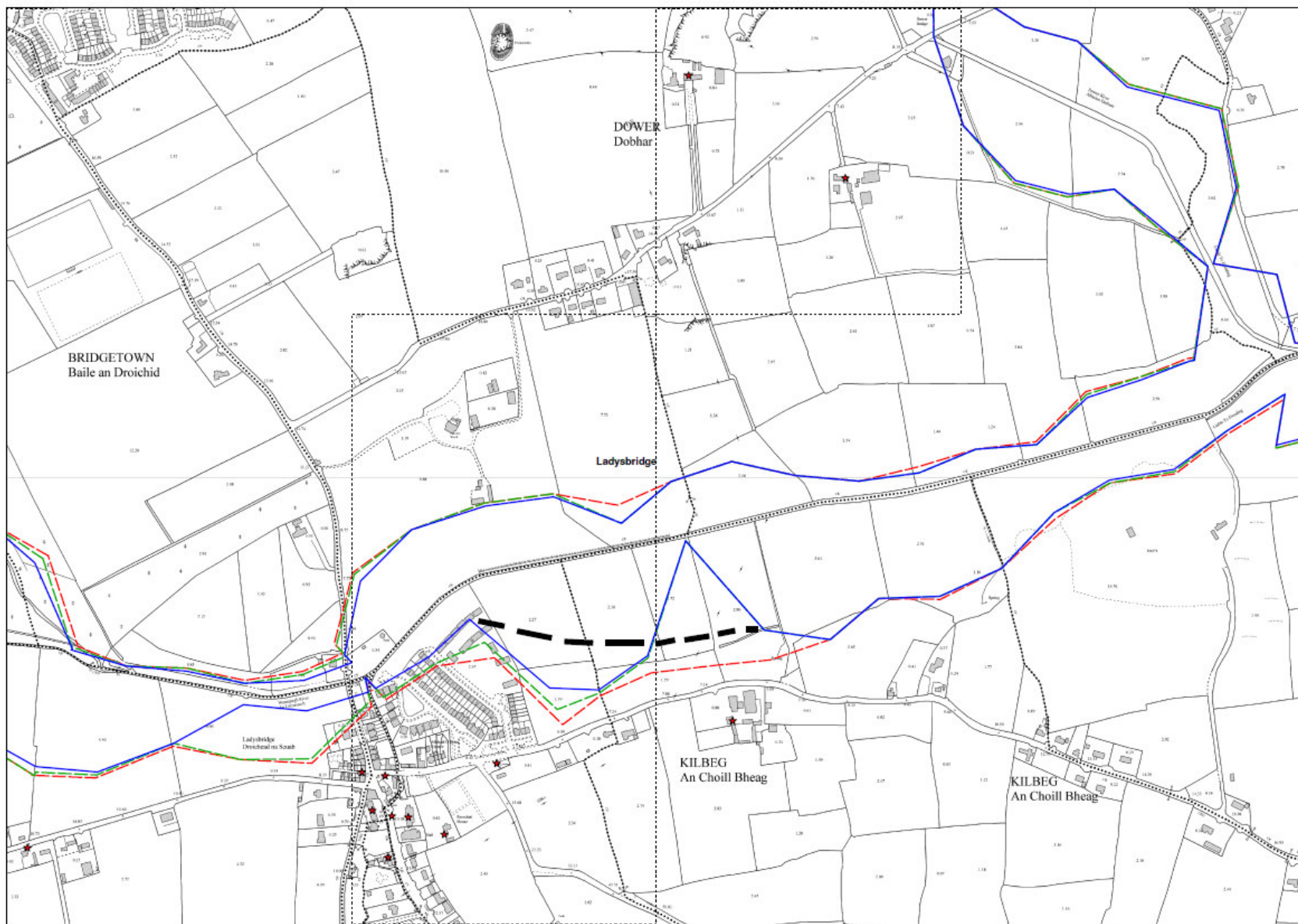
During the site visit it was noted that localised flood defences including sand bags were present at some of the entrances to the properties along the local road from Ladysbridge to Cloyne. As stated above in this report, this area is prone to flooding from surface rainwater flowing down from the Cloyne road during times of very heavy rainfall.

Summary:

The Site is not an AFA as the FRI score for Ladysbridge falls below the 250 score threshold.

Site Visit Findings:

Not AFA.



Ladysbridge Revised Outline.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Lismore	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180260	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 13/12/2011	

OPW PFRA Comments:

VAL COMMENT – R1
Some Infrastructure damage but small

VAL COMMENT – R2
RR requested at second workshop by LA

APP COMMENT – R1
Not an APSR

APP COMMENT – R2
Include for Risk Review

LA Feedback Comments:

LA COMMENT – R1
Relatively small property damage But Infrastructure

LA COMMENT – R2
2 x comm. And a No. residential at risk. Bridge constraints. Risk review. On the N72 at Lismore Canal. 2 Commercial properties and 3 dwellings at risk. Severity 5.

Floodmaps.ie Information:

Four flood events are recorded on the Floodmaps.ie website for Lismore:

1. Flood Event: Blackwater Lismore Ballyafter Oct 2004
2. Flood Event: Blackwater Lismore Ballyafter recurring
3. Flood Event: Blackwater Lismore 5 August 1986
4. Flood Event: Blackwater Lismore Ice House recurring

All of the above flood event records are within the risk review area on the overview map for Lismore.

Minutes of meeting with Waterford County Council (WCC) Lismore Area Engineer and District Overseers in 2006 to identify location vulnerable to regular

or historic flooding in the Lismore district, also identified the following areas subject to flooding within the overview map for Lismore.

- River Blackwater at the Ice House near Lismore. The R666 Regional road is regularly impassable due to recurring flooding from the Blackwater. A number of houses have flooded during major floods. Backing up of the Blackwater occurs during high tides. (Flood ID 3831).
- River Blackwater at Ballyrafter, Lismore. Commercial property and two houses are regularly flooded due to overflow from the River Blackwater, the Owennashad tributary and the Lismore Canal. The N72 National Secondary Route and R666 Regional road have been impassable for three to four days resulting in a 30km diversion for traffic. (Flood ID 3833).

Stakeholder Comments:

Waterford County Council personnel interviewed were aware of flooding in the area of the overview map for Lismore. The following is noted:

N72/R666:

The Local Authority Area Engineer confirmed that regular fluvial flooding occurs and that the N72 National Secondary Route and R666 Regional road have become impassable due to recurring flooding from the Blackwater river, Owennashad tributary and Lismore Canal. He confirmed that the commercial property and houses adjacent to the river are at risk from an overflow from the River Blackwater, the Owennashad tributary and the Lismore Canal. He recalls seeing these houses and the forecourt of the garage/shop regularly flooded.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the predicted outlines within Lismore are not representative of the local topography and historical flood events that occurred in the area.

The 10%, 1% & 0.1 AEP outlines at Ballyrafter Lismore appears to be under estimating the flood extent in this area. This amendment adds approximately 6 residential and commercial properties to the Flood Risk Index (FRI).

Based on the site visit the PFRA flood extent outlines for Lismore have been amended as shown in the map attached to this Site Inspection Report.



Owennashad tributary



River Blackwater – Lismore Bridge

Receptor Comments:

Adjusting the 10%, 1% & 0.1 AEP flood extent outline at Ballyrafter Lismore adjacent to the Blackwater, based on the site visit includes a total of 6 residential and commercial properties to the FRI. The total addition of residential and commercial receptors in this area increases the score by a maximum of 60.

Evidence of Flooding:

From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Lismore.

Summary:

The site is not an AFA as the FRI score for Lismore falls below the 250 score threshold. It is noted however from discussions with the Local Authority that fluvial flooding does occur regularly within the risk review area for Lismore, affecting some commercial/residential properties and roads adjacent to the Blackwater River.

Site Visit Findings:

Not AFA.

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Mallow	Hydrometric Area: 18	County: Cork.
Unique OPW ID: 180262	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 9/12/2011	
OPW PFRA Comments: Comments from PFRA Spreadsheet <u>VAL COMMENT – R1</u> High FRI Score, High Historic Risk and Hazard, OPW Scheme <u>APP COMMENT – R1</u> Approved - APSR – FRS <u>OPW REGIONAL ENGINEERS INPUT</u> Mallow North FRS under construction- \South and west schemes at detailed design		
LA Feedback Comments: <u>LA COMMENT – R2</u> Flooding an issue		
Floodmaps.ie Information: Twenty One flood events recorded on website: 1. Flooding at Firville West N72, Co Cork November 2009 2. Flooding at Mallow, Co Cork November 2009 3. Blackwater Mallow, 30 Dec, 1998 4. Blackwater Mallow Feb 1990 5. Blackwater Mallow Oct, 1988 6. Blackwater Mallow 6 August, 1986 7. Blackwater Mallow Nov 1980 8. Blackwater Mallow Dec 1948 9. Blackwater Mallow August 1946 10. Blackwater Mallow Sept 1875 11. Blackwater Mallow Nov 1853 12. Blackwater Mallow Race Course Nov 2000 13. Munster Blackwater Mallow Nov 2000 14. Blackwater Mallow Nov 1916 15. Blackwater River Mallow Nov 19th 2009 16. Blackwater at Killetra near racecourse recurring 17. N72 Firville West near Mallow recurring		

18. Spa Stream N72 Keatleys Close recurring
19. Oliver's cross roads near Mallow recurring
20. Clyda River Clyda Bridge Lower recurring
21. Spa Stream N72 Parkadallane junct Mallow recurring

Sixteen of these flood event records are within the risk review area on the overview map.

Flood Event 2:

This event started on Thursday 19th November 2009 and the peak flood in Mallow occurred at 23.30 on 19th November 2009. The flooding occurred due to high rainfall in the Munster Blackwater catchment, on the River Blackwater. This was the first significant flood since the completion of Phase 1 (North bank) of the flood defence works. The maximum flood level at Bridge Street was 4.64m. Seven residential houses south of the river were affected by the flooding. A number of roads in Mallow were also affected, 1km of the N72 national secondary road, 100m of the R620 regional road and 100m of the Killavullen Road (Urban). The N72 Park Road in Mallow was closed for a number of days. A map indicating the extent of flooding in the town was included in the report.

Flood Event 3:

Photographs taken of a flood in Mallow on 30th December 1998, in which the Mallow town park and Bridge Street were flooded to depths of 2.2m and 0.4m respectively. The source of the flood appeared to be the River Blackwater. This event was noted as a 1 in 5 year flood. A Flood Study (July 2000) of the Blackwater and Spa Glen River at Mallow was included in the record. The study noted that a serious flood occurred in 1980 and that Mallow suffers regularly from flooding from the Spa Glen stream or due to the River Blackwater with flooding of Bridge Street and Spa Walk occurring in 1986m 1988, 1990, 1995, 1998 and twice in 1999. The Study included a map outlining the estimated 1:100 flood event extents in Mallow.

Flood Event 4:

Flooding of Bridge Street occurred in February 1990. Refer to flood event 3.

Flood Event 5:

Flooding of Bridge Street occurred on 11 October 1988 solely due to flooding from Spa Glen.

Flood Event 6:

Flooding of Bridge Street and Park Road occurred on 6 August 1986. Peak flood level at Bridge Street was 1m lower than reached during the November 1980 level. Refer to flood event 7.

Flood Event 7:

The flood started on 2nd November 1980 when the town park flooded at 10am. At 11.30am water levels rose quickly and within 30minutes flooded the lower parts of the town. Flood waters reached the cinema north of the river and the post office south of the river. Bridge Street was flooded to a depth of more

than 2.5m.

Flood Event 8:

On 2nd December 1948, Mallow town park was flooded to a depth of 2.5m. On 5th December 1948 Bridge Street was flooded due to flooding of the Spa Glen stream. On the 6th December 1948 additional flooding of houses in Ballydaheen south of the river occurred due to a large overnight thunder storm.

Flood Event 9:

On 12th August 1946 houses on Spa Walk were flooded as the Spa Glen (the canal) overflowed. Bridge Street was inundated by several feet of water.

Flood Event 10:

On 26th September 1875 Bridge Street was flooded by “very deep” water and the bridge deck in the river was submerged.

Flood Event 11:

On 2nd November 1853, the River Blackwater flooded the town park and Bridge street. Water rose 3m in 40 minutes. Lower streets were under 3.6m of water and the bridge collapsed.

Flood Event 13:

On 5th and 6th November 2000 the N72 secondary national road was blocked due to the River Blackwater. A flood due to the Spa Glen stream flooded Bridge Street and Spa area, where 7/8 people had to be evacuated.

Flood Event 14:

On 17th November 1916 Bridge Street, Bridwell Lane, St. Joseph's Road, Spa Walk, Spa Terrace and lower sections of Ballydaheen and Broom Lane were flooded. The flood at Bridge Street was 1.4m deep. The significant flow damaged the bridge deck railings.

Flood Event 15:

Refer to flood event 2.

Flood Event 18:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. Road flooding on N72 due to Spa Stream – recurring Flood ID 5110.

Flood Event 20:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. R619 Road flooding during high flow in Clyda river. – recurring Flood ID 5118.

Flood Event 21:

Minutes of a meeting with Cork County Council Area Engineer for Mallow Area on 25/05/2005 identified the following area subject to flooding. Road flooding on N72 and at junction perpendicular road due to Spa Stream –

recurring Flood ID 5111.

Stakeholder Comments:

Contacted the Cork County Council Area Engineer by phone 12/12/2011. The Area Engineer asked for a copy of the draft flood maps for review.

Predictive PFRA Flood Outline:

From the site visit it was noted that there appears to be some anomalies in the flood extent outlines. Based on the site visit the PRFA outlines have been amended as shown in the maps attached to this Site Inspection Report. A summary of anomalies noted as follows:

Mallow North:

West of the N22 road stream related flood outline amended.

Mallow Central:

North of N72 Park Road 10% AEP outline amended.

West side of N72 Park Road 10%, 1% & 0.1% AEP outlines amended.

East side of Bridge Street and Bridewell Lane AEP outlines amended.

N72 Spa Walk road AEP outlines amended.

Mallow Southeast:

Wedges in 10%, 1% & 0.1% AEP outlines amended.

Mallow Southwest:

North of R619 Mill Street 10% AEP outline amended.

Receptor Comments:

The amendment of the flood extent outline has confirmed the following:

1. North of the N72 Park Road approximately 7 residential/ commercial premises have been reallocated from the 10% AEP outline to the 1% AEP outline.
2. At Bridge Street and Bridewell Lane approximately 15 residential/ commercial premises have been added to the 10% AEP outline.
3. At Spa Walk approximately 8 residential premises have been added to the 10% AEP outline.

This would lead to an increase in the residential and commercial FRI score of 167 and would increase the total FRI score from 1980.2 to 2147.2.

Evidence of Flooding:

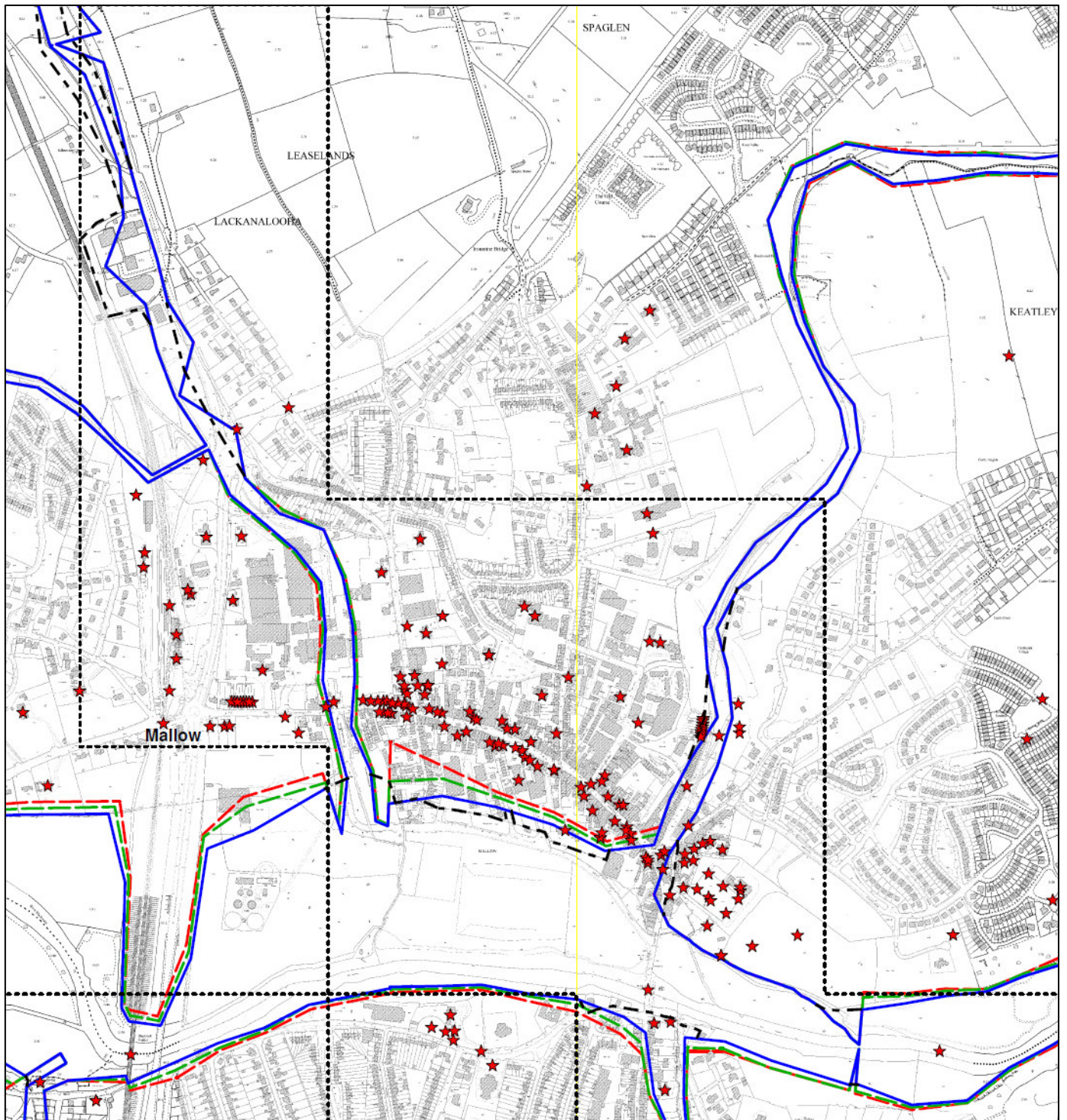
North of the river at Bridge Street, some Flood Protection (Defence) Works are completed. In Ballydaheen south of the river, Flood Protection Works are currently under construction southeast of the bridge. Refer to the locations highlighted in the attached maps included in the Appendix to this Site Inspection Report.

Summary:

The site is AFA because of the high number of properties and road infrastructure affected by regular flooding in the town. Flood protection works are currently under construction. At Mill Street in Ballydaheen (Mallow Southeast), it was noted that the mapped flood extent during Flood Event 2 in November 2009 was equivalent to the 0.1% AEP outline. The Stage 1 Flood Protection Work north of the river at Bridge Street may have had the effect of increasing the flood south of the river. This should be monitored further when the works south of the river are completed.

Site Visit Findings:

AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Glenbeigh	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220333	Site Type: ARR	Source of Flooding: Fluvial & Tidal
Surveyor: David Murphy	Date: 14 & 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT - R1:</u> OPW Regional Severity = 3, FRI Score > 250 <u>VAL COMMENT – R2:</u> LA do not consider as an APSR <u>APP COMMENT R1:</u> Approved – APSR <u>APP COMMENT R2:</u> FRI = 359 - Include for Risk Review to confirm status		
LA Feedback Comments: <u>LA COMMENT R1:</u> LA are not aware of any flood risk in the village itself. Some townlands East and North of the village can be at risk from tidal flooding – Kilnabrack, Reennanalagane, Faha. <u>LA COMMENT R2:</u> Not an APSR		
Floodmaps.ie Information: Two flood events are noted within the Glenbeigh ARR as follows: <u>Inchera (Flood ID - 4716/4717):</u> High tides cause stream to back up and it is exacerbated by heavy rainfall/runoff. Frequency is once every 5 years. Exceptional flooding in August 1986. Road is flooded and impassable. 8 no. houses are liable to flooding. <u>Glenbeigh (Flood ID - 4718):</u> The cause and frequency are the same as noted for Inchera above. One house was flooded 3 years ago. There is a lot of development in this area. An OPW note is also included which discusses flood risk to 7 houses in the		

Inchera/Glenbeigh area which were previously protected by an embankment. The note explains that the embankment is in disrepair (dated 1997) and that it may have once been maintained by the land commission but no documentation was available to confirm this.

Stakeholder Comments:

Enquiries were made with 4 local people in relation to flooding in the area. All were unaware of any flood problems in the village but confirmed that houses near the mouth of the Behy River at Inchera had flooded on occasion due to high tides.

One woman who lived in this area stated that local tidal flood defences in place helped reduce the frequency and severity of this. She also advised that her own and nearby houses were not affected by the River Behy despite it being in close proximity (only the road and narrow margin separates the river from the property boundaries).

One man advised that despite the fact that a caravan park in the village is located beside the river, this and other properties along the river bank are not affected by flooding. The same individual also advised that an old culvert below the main street in the town had recently been exposed during telecoms works and that some improvement works were due to be carried out by the local authority in order to improve its structural integrity.

The LA were contacted in relation to flooding in the Glenbeigh area and staff were able to advise as follows:

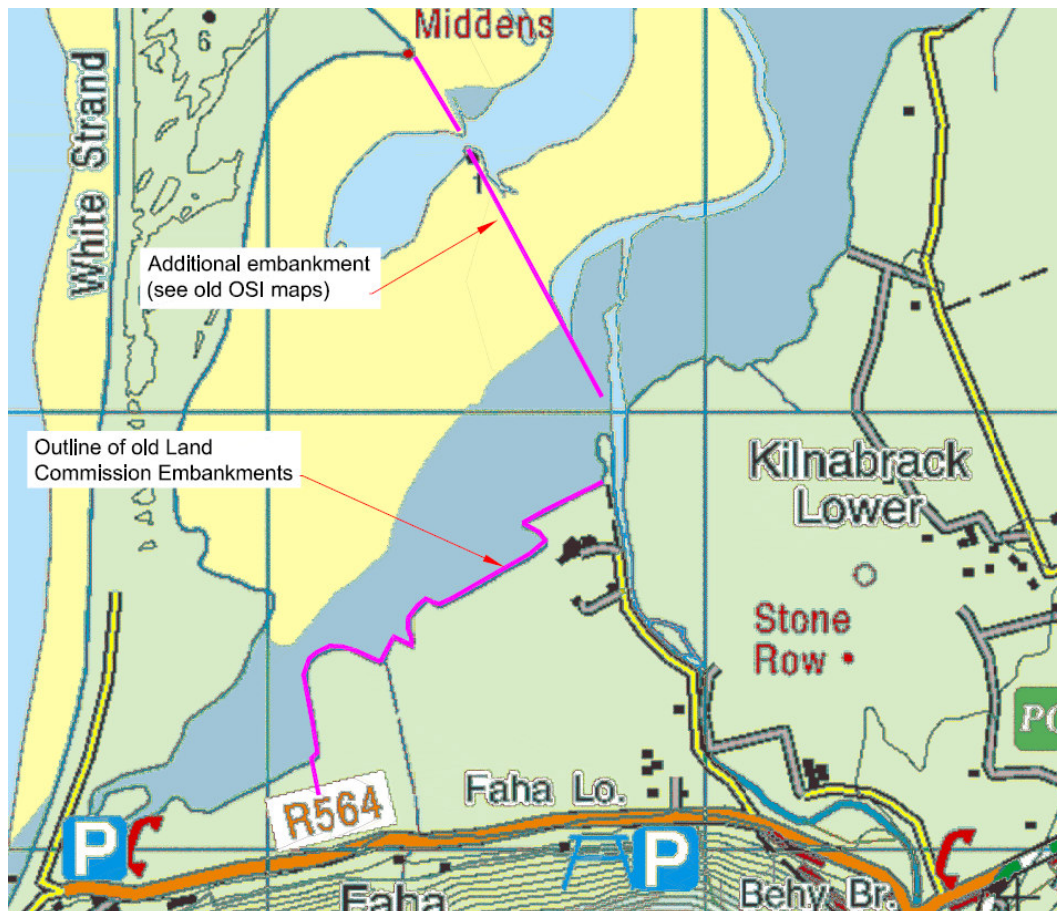
Piers and Harbour and Area Engineering staff and were not aware of any significant flooding due to River Behy although they could envisage properties being affected in the event if a combination of storm flows with other events e.g. low pressure/high onshore winds/spring tides.

The main concern for this location relates to tidal risk to houses located in the Faha, Kilnabrack Lower and Reennanallagane townlands. These locations are low lying but are protected to some extent by an old land commission flood wall (see approximate extent on map below) and also benefit from a natural sand spit.

However, the defence walls are in very poor condition and the spit is also suffering from erosion with staff estimating approximately 50-60 acres of spit being eroded in recent times. It is feared that erosion of the spit will mean less dissipation of wave action and possible increase in flood risk to houses in the area. Staff also mentioned a study being undertaken by the HMRC in relation to the possibility of rehabilitation of the spit.

LA staff also advised that the local residents carry out maintenance of the defences as best they can and on occasion the LA have provided spare materials for this purpose.

The LA are particularly concerned that the flood defences are no longer anyone's direct responsibility since the Land Commission ceased to operate and as a result, the defences are likely to continue to deteriorate as maintenance is only carried out in a reactive fashion or in some cases, not carried out at all.



Approximate line of Land Commission defence embankment

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% fluvial flood outlines quite similar for the ARR and in most cases, these appear to be consistent with the topography of area.

Discussions with stakeholders indicate that the fluvial boundaries may be slightly over estimating the risk in some locations. Some wedges/anomalies are also evident and it is proposed that boundaries are revised to reflect this.

The proposed amendments to the predicted PFRA fluvial boundary are indicated on the attached map.

No changes are proposed for the predicted PFRA tidal risk boundaries since these appear to accurately reflect the location of properties currently at risk from tidal waters. The outlines do not follow the line of the land commission embankments and would therefore appear not to consider these as effective defences.

Receptor Comments:

Revision of the predicted PFRA fluvial flood boundaries has resulted in 14 properties in addition to two monuments being excluded from the 10 year flood outline. This reduces the flood risk index for the area to 198.8

The photo below shows one of the newer houses in the area which, although located beside the river, has been constructed at an elevated level, presumably to reduce the risk of flooding:

**Evidence of Flooding:**

No evidence of flooding was noted. High water marks were observed for the River Behy and smaller streams but none of these indicated over topping of the banks.

A tidal flood defence embankment near the confluence point of River Behy and the sea was observed and is shown in the photo below:



Land Commission defence embankment (looking south west, towards Faha/Rossbehy from lane adjacent to Behy River)

Summary:

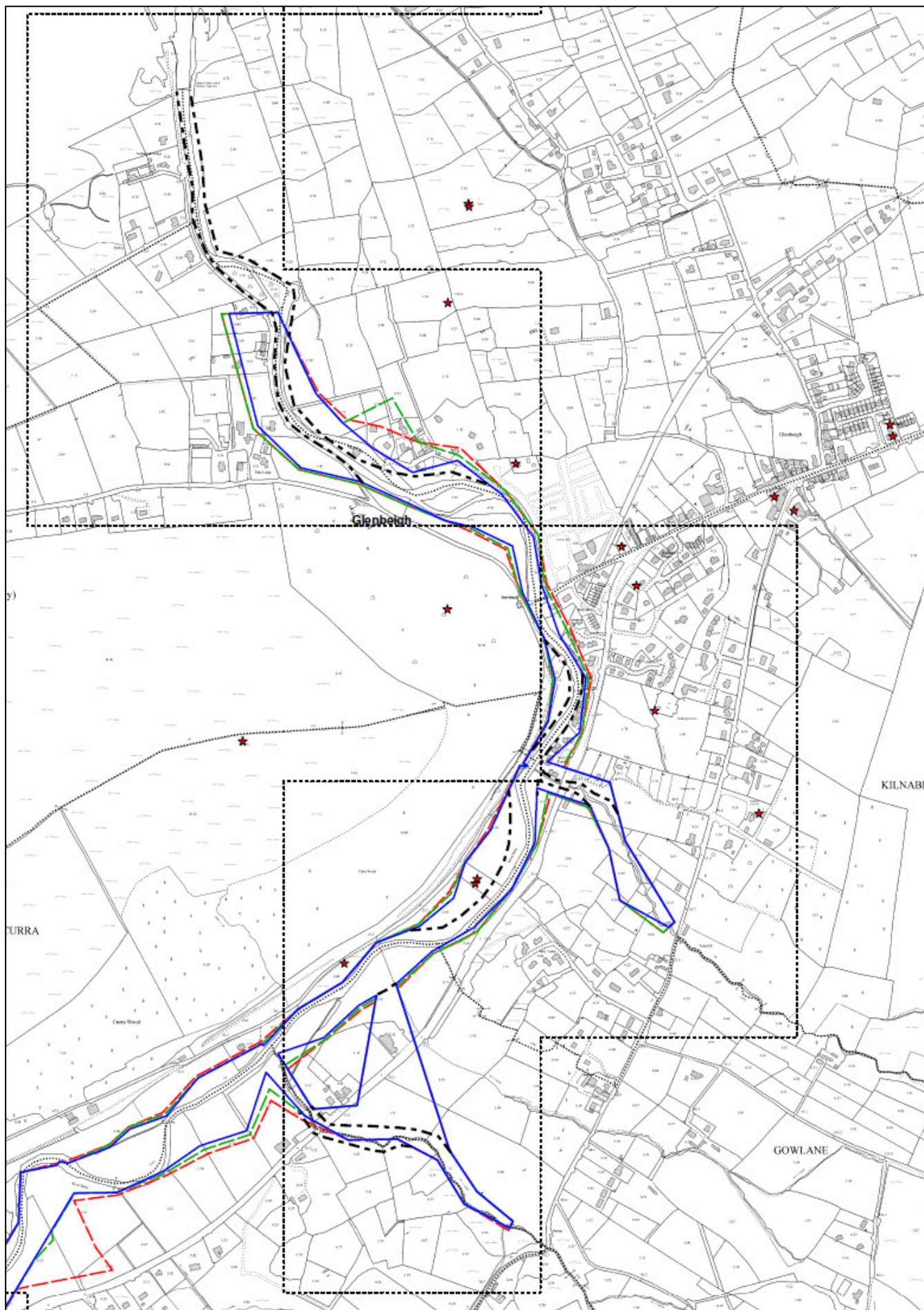
It appears that most receptors are not at risk from fluvial flooding while a small number of residential properties are at risk of flooding due to high tide.

However, since the home owners at risk are aware of this issue it is not recommended that further assessment required.

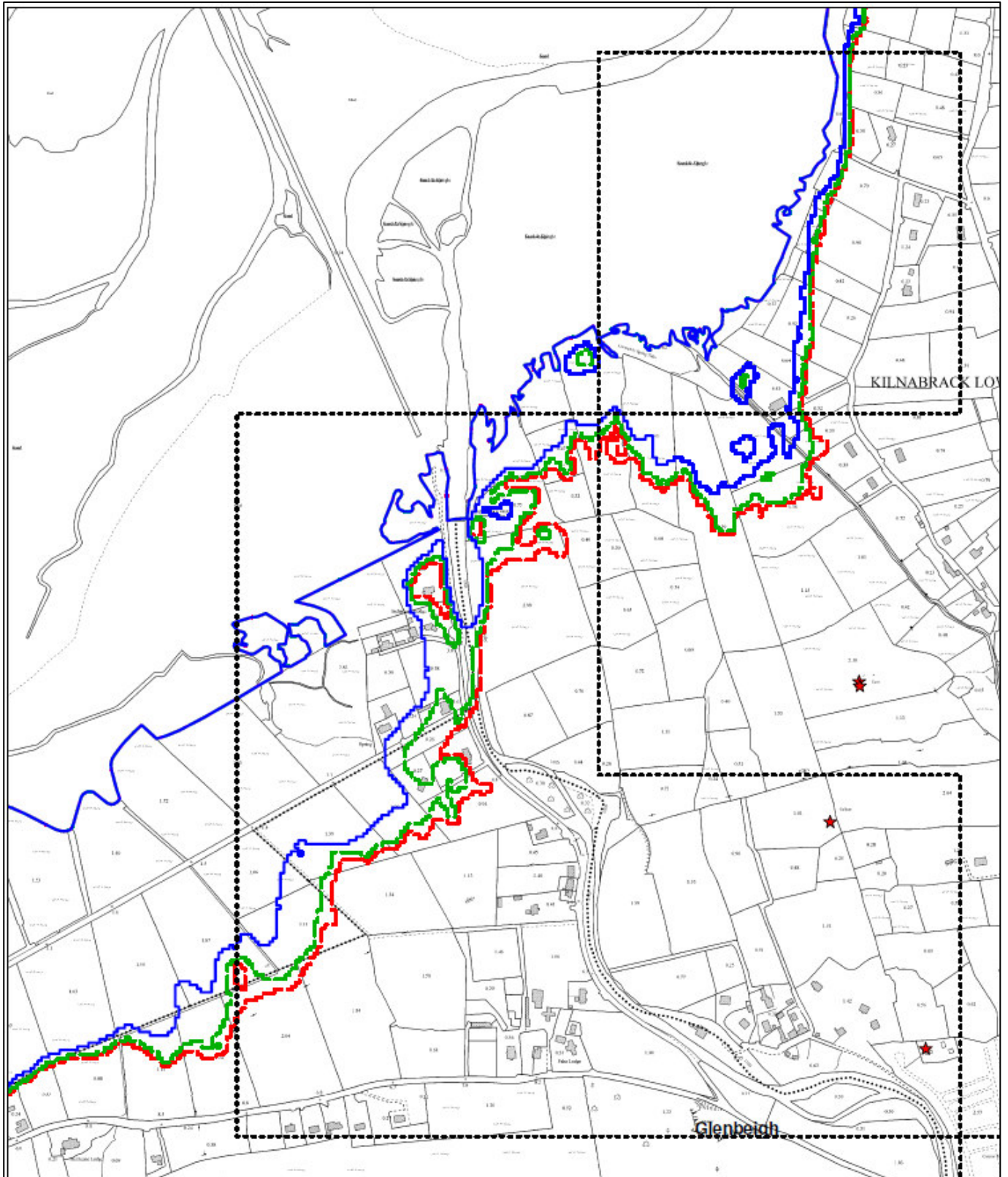
Instead, it is recommended that works are carried out to improve and maintain the existing tidal defences in order to protect these locations from future flood events. Works proposals should be cognisant of any recommendations regarding the spit which may arise from the HMRC study.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -



Tidal Boundary (No changes proposed)

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Milltown	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 220339	Site Type: CAR	Source of Flooding: Fluvial & Tidal
Surveyor: David Murphy	Date: 09/12/2011	
OPW PFRA Comments: Nursing Home in flood zone		
LA Feedback Comments: <u>LA COMMENT ROUND 1:</u> None <u>VAL COMMENT - R1:</u> Protected by Defences, Nursing Home in Flood Zone - Risk Review <u>APP COMMENT R1:</u> Approved - APSR (FRS?)		
Floodmaps.ie Information: The website does not indicate records of historical flooding at locations within the risk review area on the overview map. The closest recorded flood event is further upstream on the River Maine near Annagh Bridge, Castlemaine in February 2002. Large areas of benefitting land are indicated near to this area.		
Stakeholder Comments: Two local people were consulted about flooding during the survey. One was a resident of a housing estate north west of the nursing home and he stated that he was not aware of any flooding issues associated with river adjacent to the estate. The other was resident of a house located beside the stream in the northern section of the review area (Ballyoutragh Stream). He advised that although the stream sometimes overtops its banks onto the road. This is not very frequent, flood water is usually at shallow depths and this occurs only for short periods of time during heavy rainfall.		

He also advised that a local farm house which is within the PFRA flood outlines was affected a few years ago and that the likely source of the problem is at a downstream bridge where the culvert pipes have less capacity than upstream (see photos below).



Three pipe culvert on Ballyoutragh stream at access point to residential property

The Local Authority had no specific issues in relation to this site.



Two pipe culvert on Ballyoutragh stream at access point to residential property (downstream of first photo hence restriction at flow rates)

Predictive PFRA Flood Outline:

The 10% AEP outline generally matches the 1% and 0.1% AEP fluvial outlines used in the PFRA analysis except at the north end of the review area where some possible wedges are present.

No particular issues were noted in relation to the tidal outlines and hence no changes are proposed.

Through comparison of the PFRA flood extent outlines with the topography observed on site, the outlines were modified to show a more likely flood extent as indicated on the attached map.

Receptor Comments:

Proposed changes to the flood extent outlines will result in approximately 23 residential properties being excluded from the 10% boundary. In addition, it is proposed that the nursing home is also excluded due to its elevation relative to the nearby stream.



Nursing home (road culvert entrance for stream visible as wall extension on LHS of photo)

Evidence of Flooding:

No evidence of flooding observed. It should be noted that some masonry walls at new estates and near the nursing home may unintentionally act as flood defences.

Summary:

Although the exclusion of the nursing home and a number of newer properties from the flood extent outlines will reduce the index from 3123 to 393, it will still be above the threshold and hence further assessment is required.

Site Visit Findings:

AFA.

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Mitchelstown	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180263	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Low Historic Hazard and Risk, No Feedback from LA, Low FRI score <u>APP COMMENT – R1</u> LA requested RR at second workshop - new development close to river		
LA Feedback Comments: <u>LA COMMENT – R1</u> Treatment Plant beside the River. Dairygold Property <u>LA COMMENT – R2</u> As per OPW flood report		
Floodmaps.ie Information: Five flood events recorded on website: 1. Curraghbowen Mitchelstown Cork recurring 2. Ballynamona Bridge Mitchelstown Cork recurring 3. R-665 Ballyporeen Rd, Mitchelstown Cork recurring 4. Ballinwillin, Mitchelstown Cork recurring 5. Mitchelstown Sewage Treatment Plant recurring Minutes of a meeting with Cork County Council Area Engineer for Mitchelstown Area on 22/04/2005 identified the following four areas subject to flooding that within the risk review area on the overview map. <u>Flood Event 2:</u> Ballynamona Bridge – L-1418 - recurring Flood ID 1219 <u>Flood Event 3:</u> R-665 Ballyporeen Road floods at Kilshanny junction Flood ID 1217 <u>Flood Event 4:</u> Floodplain of Gradoge river, townland of Ballinwillin - recurring Flood ID 1226		

Flood Event 5:

Mitchelstown Sewerage Works flooded in 1985, submerged from Gradoge River Flood ID 1218

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

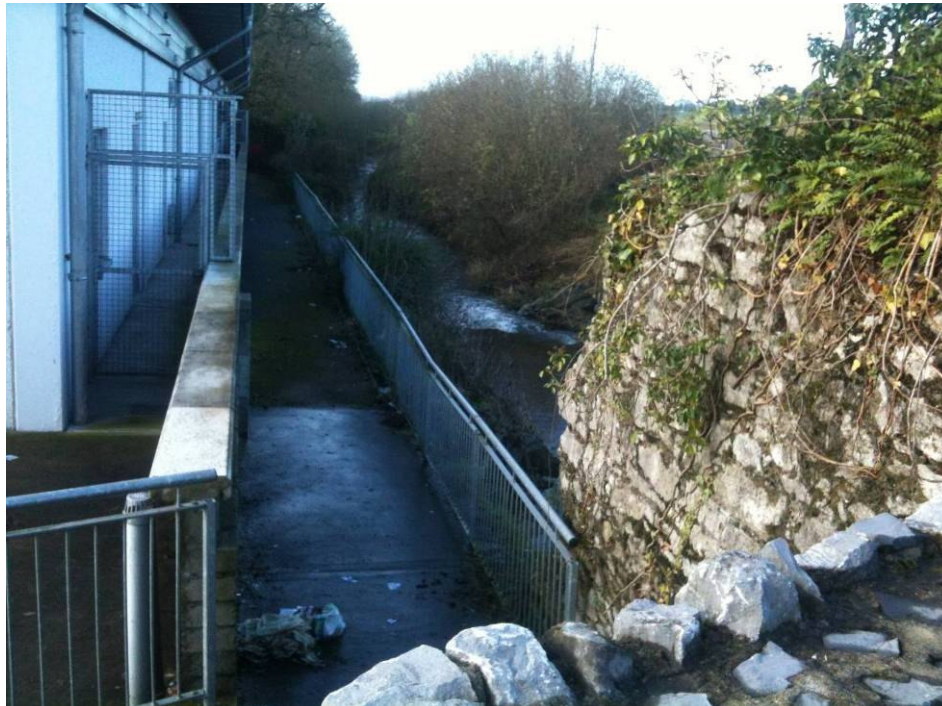
From the site visit, the flood extent outlines appear to be consistent with the topography of the site north and east of the town. The PFRA flood extent outlines have been amended as shown in the attached maps included in the Appendix to this Site Inspection Report.

Receptor Comments:

The amended flood risk outlines include approximately 18 residential / commercial properties and the wastewater treatment plant in the 10% AEP flood extent outline and 2 residential / commercial properties in the 1% AEP outline. This together with the archaeological (10) and monument (20) risk index ratings leads to a total FRI score of 237.

Evidence of Flooding:

At Dublin Road North of the town, ground levels at the Aldi shop have been raised and a flood defence wall is located east of the shop.



Flood Defence wall east of Aldi shop north of the town on the Dublin Road.

North of R665 Clonmel road north of the Dairygold yard a flood defence wall

has been erected and the apartment blocks west of Dairygold have raised ground levels.



View of flood plain and Dairygold boundary wall north of R665 Clonmel road



Ballynamona Bridge on L-1418 road.



New Housing estate "Sliabh Alainn" at Ballynamona Bridge on L-1418 road with flood bund west of the river.



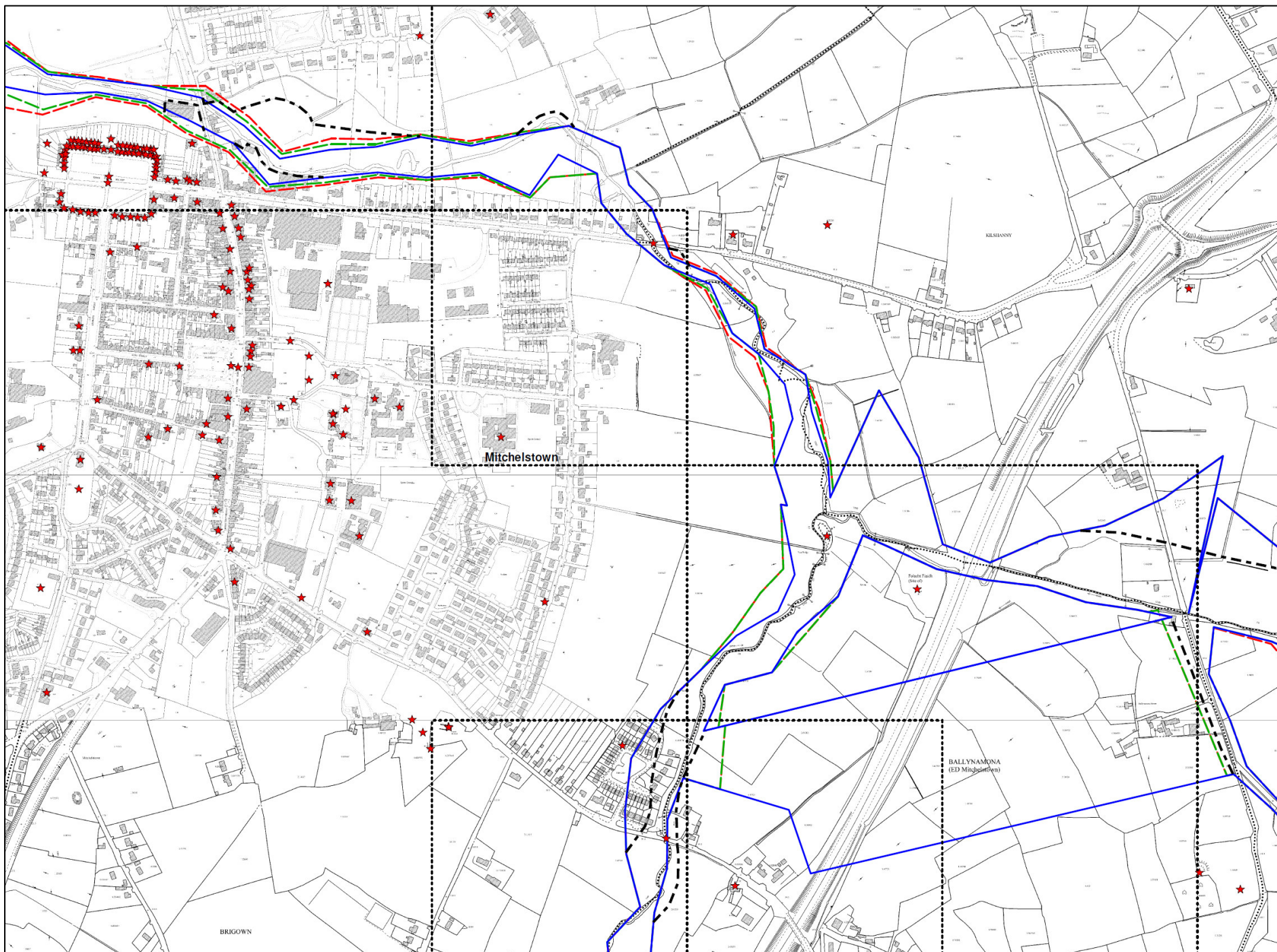
Channel widening works south of Ballynamona Bridge on L-1418 road.

Summary:

This site is not an AFA because flood risk in the town is low. Flood protection works currently in place at Aldi and Dairygold yard. Additional flood protection works is recommended near the Sliabh Ailainn estate at Ballynamona Bridge together with a moratorium on constructing new houses in the floodplain.

Site Visit Findings:

Not AFA.



Revised Flood Boundary - - - - -

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Mogeely	Hydrometric Area: 19	County: Cork.
Unique OPW ID: 190276	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 07/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> FRI Score > 250, However no concerns expressed by LA or OPW Region, Wedges in Model <u>VAL COMMENT – R2</u> LA requested RR at second workshop <u>APP COMMENT – R1</u> Errors in predictive flood extent - Not an APSR <u>APP COMMENT – R2</u> FRI = 388, but errors in mapping - Not covered by Lee CFRAM - Include for Risk. Review to confirm status		
LA Feedback Comments: <u>LA COMMENT – R2</u> Complex Drainage System, underground rivers. Development Plan flood extents show residential flooding. Requested Risk Review.		
Floodmaps.ie Information: Three flood events are recorded on the Floodmaps.ie website for Mogeely: <ol style="list-style-type: none"> 1. Flood Event: Castlemartyr, Middleton, Co.Cork 19th November 2009 2. Flood Event: Garranejames, Killeagh, Co.Cork. 19th Nov 2009 3. Flood Event: Castlemartyr, Co. Cork Recurring. (Flood ID 2209) <p>It is noted however that the above flood event records are not located within the risk review area on the overview map for Mogeely.</p> <p><u>Flood Event 1:</u> This flooding event started on Thursday 19th November 2009. The peak flood occurred on Thursday 19th November 2009. The source of the flood waters was</p>		

a river (and the cause was channel overtopping). The flooding occurred in the Womanagh catchment, on the Kiltha River. The maximum flood level (metres OD Malin) was 9.75m with a flood depth (metres) of 0.25m. Three residential properties were affected by the flooding event and 100m of the local road L3805 was flooded. Some pasture lands were also flooded.

Flood Event 2:

The source of the flood waters was a runoff (and the cause was surface water drainage). The flooding occurred in the Dower/Womanagh catchment. 300m of the local road L7836 and some pasture lands were flooded.

Flood Event 3: Flood ID 2209

Minutes of a meeting with Cork County Council Area Engineer for Youghal Area on 20/04/2005 identified the following area subject to flooding.

Castlemartyr flooding problem at Bridge, capacity problem, properties on the right hand side have been effected in past, approximately frequently of once every two years – recurring. Flood ID 2209.

Stakeholder Comments:

During discussions with a senior member of staff with Dairygold at the creamery in Mogeely, he confirmed that there has been no fluvial flooding in the area of the creamery during his employment with Dairygold in Mogeely. He did state that approximately 2.5 years ago (2009) that the creamery's effluent treatment plant approximately 1 kilometre south of the village of Mogeely was flooded, however this is located outside the flood risk review area on the overview map for Mogeely. He confirmed that upgrade flood protection works have since been carried out at this effluent treatment plant.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% AEP outlines between the Kiltha River and the river/stream to the east of the village in the vicinity of the new housing estate and railway line are not representative of the local topography, therefore overestimating flood risk in this area. From the site visit it would appear that there are errors in these outlines which would remove a total of 3 residential and commercial properties within the 10% AEP outline from the FRI and a total of 118 residential and commercial properties within the 1% AEP outline from the FRI.

Based on the site visit the PFRA outlines for Mogeely have been amended as shown in the attached map.



Bridge at north end of village - Kiltha River



Bridge adjacent to Dairygold Creamery - Kiltha River

Receptor Comments:

Adjusting the 10% AEP flood outlines between the Kiltha River and the river/stream to the east of the village in the vicinity of the new housing estate and railway line, removes a total of 3 residential and commercial properties from the FRI. The total reduction of residential and commercial receptors in this area reduces the score by 30 points.

Adjusting the 1% AEP flood outlines between the Kiltha River and the river/stream to the east of the village in the vicinity of the new housing estate and railway line, removes a total of 118 residential and commercial properties from the FRI. The total reduction of residential and commercial receptors in this area reduces the score by 118 points.

The overall amendments of the Flood Risk Outlines have lead to a reduction of 148 points from the Flood Risk Index total. This reduces the FRI score from 388 to 240.

Evidence of Flooding:

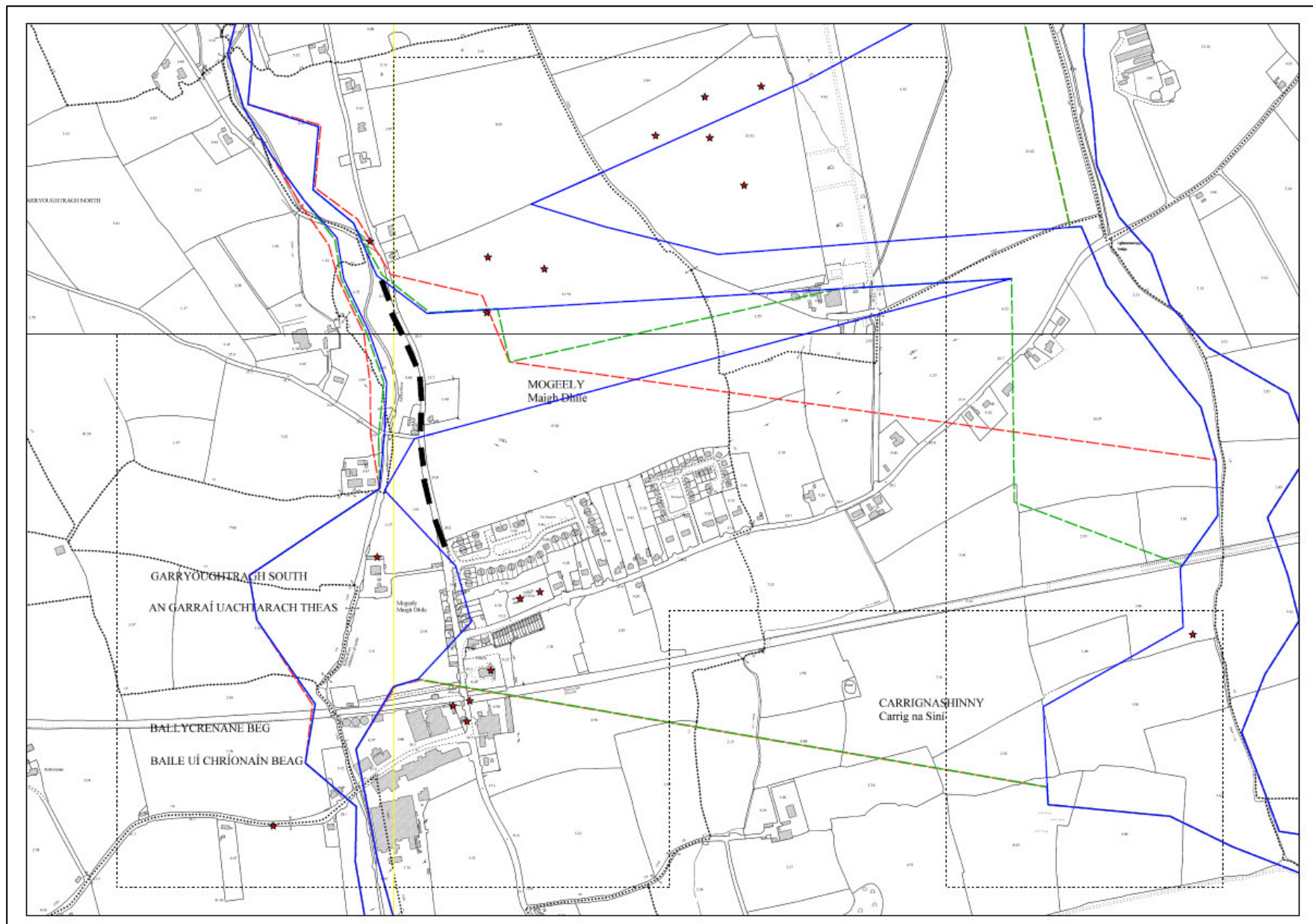
From the site visit there appeared to be no evidence of fluvial flooding anywhere within the risk review area for Mogeely.

Summary:

Due to the amendments to the flood risk outlines the site is therefore confirmed as a Non AFA as the FRI score for Mogeely falls below the 250 score threshold with a score of 240.

Site Visit Findings:

Not AFA.



Mogeely Revised Outline

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Portmagee	Hydrometric Area: 22	County: Kerry.
Unique OPW ID: 220340	Site Type: ARR	Source of Flooding: Fluvial/Coastal
Surveyor: John O' Riordan	Date: 15/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> LA not sure of why included, High coastal flood score. <u>APP COMMENT – R1</u> Doubts over degree of risk - Risk Review - Confirm using ICPSS maps when available - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Not sure of any particular reason for inclusion of this location.		
Floodmaps.ie Information: One flood event is recorded on the Floodmaps.ie website for Portmagee: 1. Flood Event: R565 at Portmagee Recurring The above flood event record is within the risk review area on the overview map for Portmagee. Minutes of meeting with Kerry County Council (KCC) Cahersiveen Area Engineer in 2006 to identified the following area subject to flooding within the overview map for Portmagee. <ul style="list-style-type: none"> • Portmagee R565 (Flood ID – 4672). The R565 is flooded on average twice per year. Cause is tides/wind. Road impassable for 3/4 hours with maximum depth of 450 to 500mm. 		
Stakeholder Comments: During discussions with three Kerry County Council employees local to the area they stated that there was no history of coastal flooding to the village of Portmagee. They did not remember any residential or commercial properties ever been affected. The only concern they had with flooding was an issue due to blocked drains in the area.		

A member of staff at a commercial premises located on the sea front stated that she had no recollection of any flooding to the premises. Two local men within the premises also confirmed her statement that no flooding had occurred.

Further down the road at a lower level, the owner of the local shop/post office stated that coastal flooding had previously occurred to the back garden and to the back of the premises. She confirmed that a sea wall has since been constructed to the back of the premise approximately 10 years ago, and without it the building would be frequently flooded. The owner of the shop stated that she never witnessed any of other buildings along the street ever being affected however she does recall hearing many years ago that the street was flooded and that possibly some houses were affected.

During discussion with all of the above locals of Portmagee they confirmed that frequent flooding occurs to the R565 Regional Road prior to entering to village which causes the road to become impassable. They stated that at times of high tide the level of the sea is level with the road and that the adjacent field also floods. It is felt that the road should be raised in this area and appropriate warning signage should be installed.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the predicted outlines within Portmagee are not representative of the local topography and historical flood events that occurred in the area.

Some sections of the AEP outlines within the town of Portmagee appear to be overestimating coastal flood extent in this area. Following amendments to the floods outlines it is noted that approximately 20 residential or commercial receptors are located within the AEP outlines.

Based on the site visit the PFRA outlines for Portmagee have been amended as shown in the attached map.



Sea wall back of local shop/post office



Maurice O'Neil Memorial Bridge



Island off Portmagee - Illaunloughan



Bridge - Stream



R565 Regional Road – Frequently flooded

Receptor Comments:

The amendments to the floods outlines results in approximately 20 residential or commercial receptors located within the AEP outlines resulting in a score of 200. A PFRA score of 1040 point was previously allocated for the monuments which are located on the island (Illaunloughan) off Portmagee. It is considered that it is not practical to implement any flood risk mitigation measures for these monuments. The monuments are at risk from tidal flooding and there is little scope to reduce the magnitude of this type of flooding. It is likely that the construction of hard defences to protect these monuments would not be acceptable as these could physically damage the structure of the monuments or adversely alter the physical context of the monuments in the existing landscape. Furthermore, it is evident that these monuments have been at this location for a very long time and have survived many flood events to date. It is therefore thought that the score of 1040 could be removed from the Flood Risk Index (FRI). It is considered that a final FRI score of 200 points is more appropriate for this area.

Evidence of Flooding:

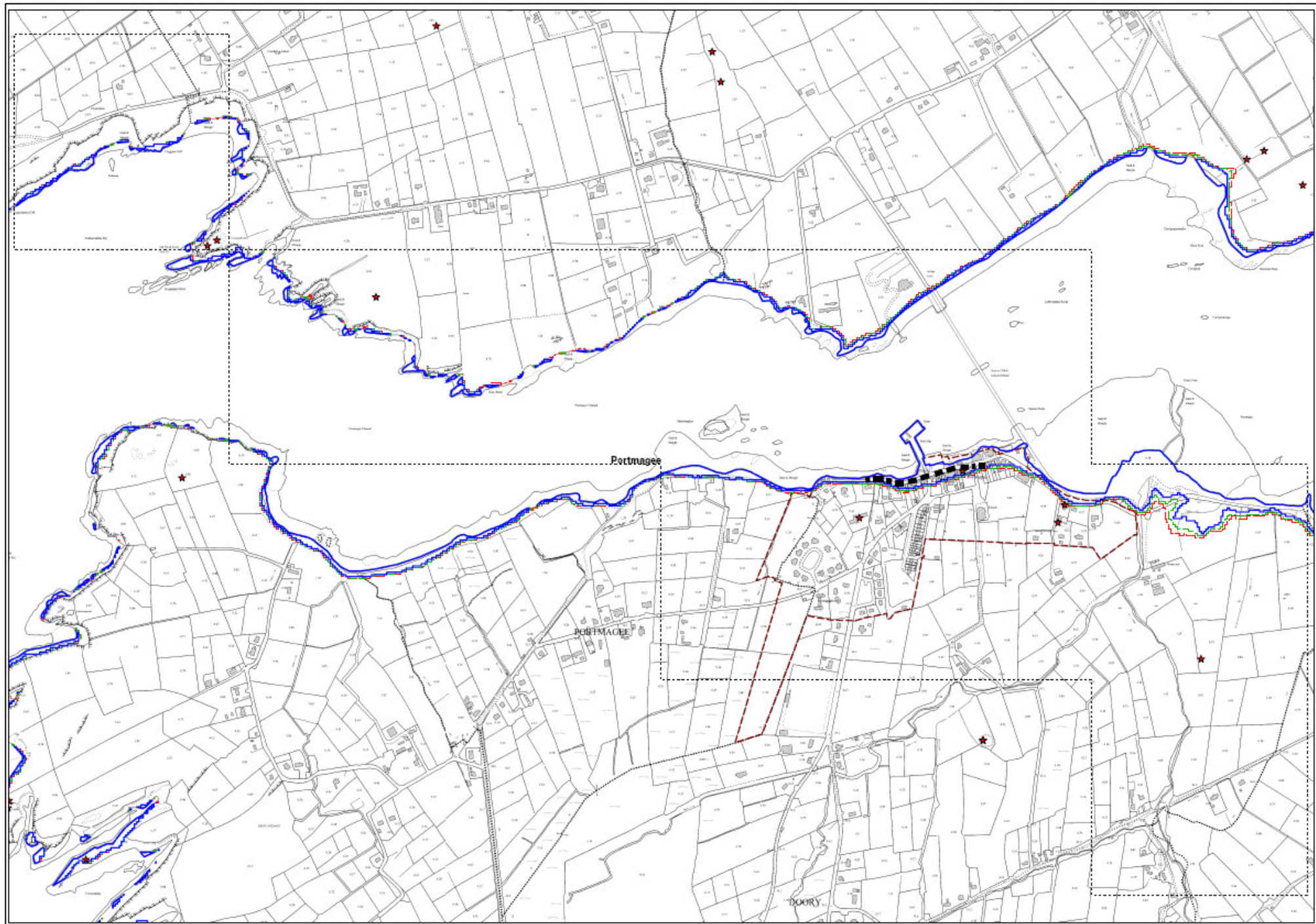
From the time of the site visit there appeared to be no evidence of fluvial flooding within the risk review area for Portmagee.

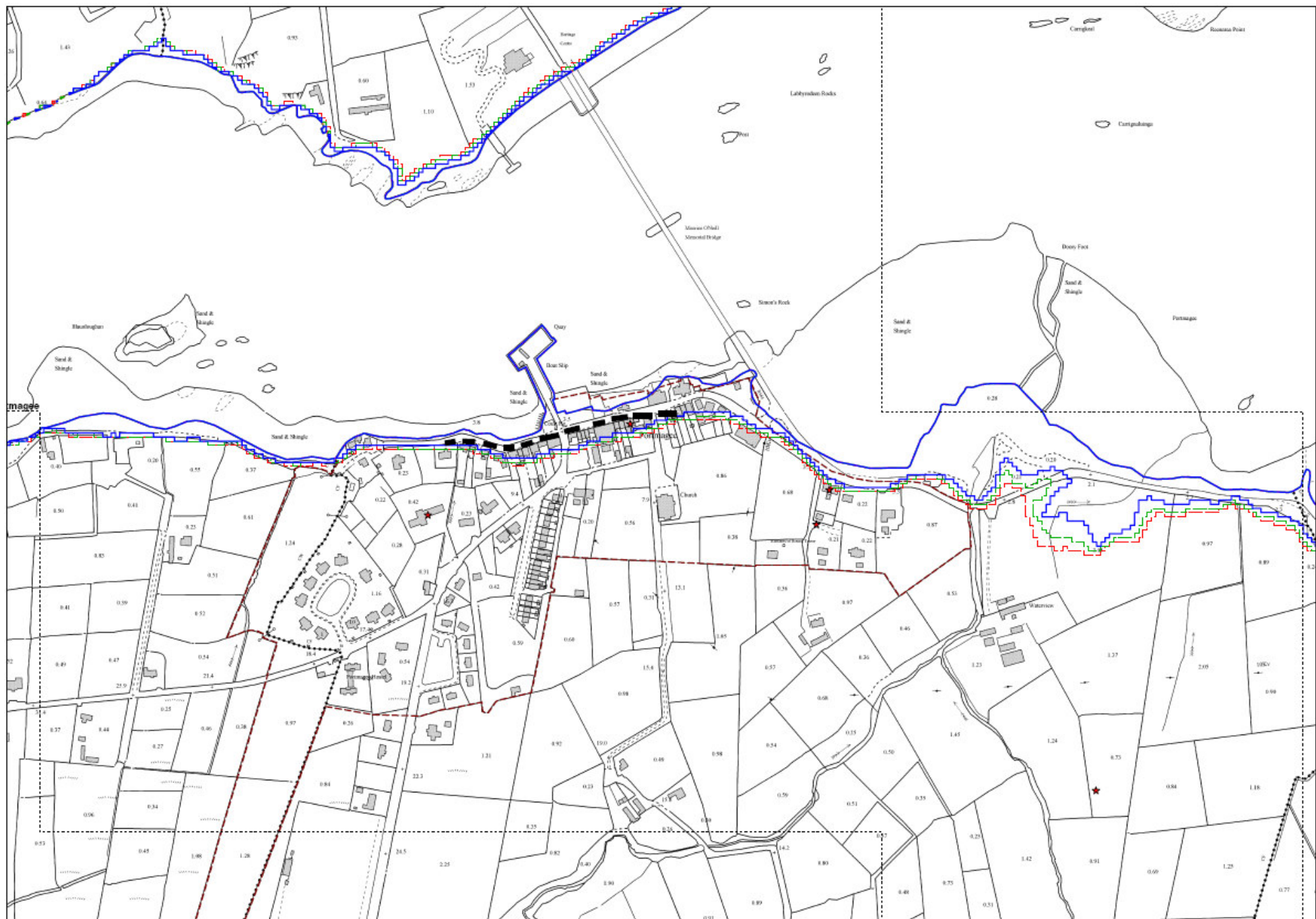
Summary:

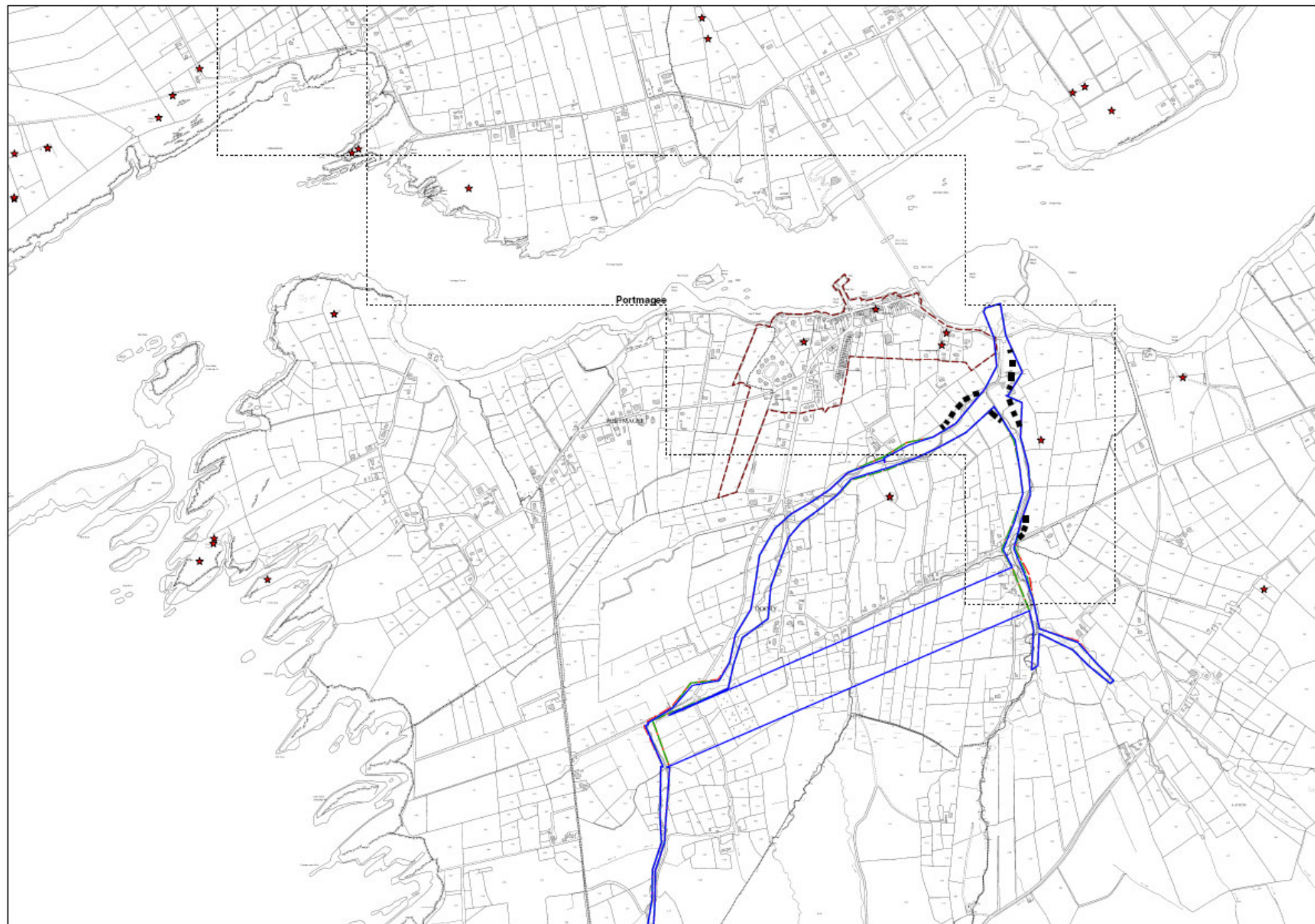
The Site is therefore confirmed as a Non AFA because the vulnerability of flooding to residential and commercial properties is considered low and that the FRI score for Portmagee falls below the 250 score threshold.

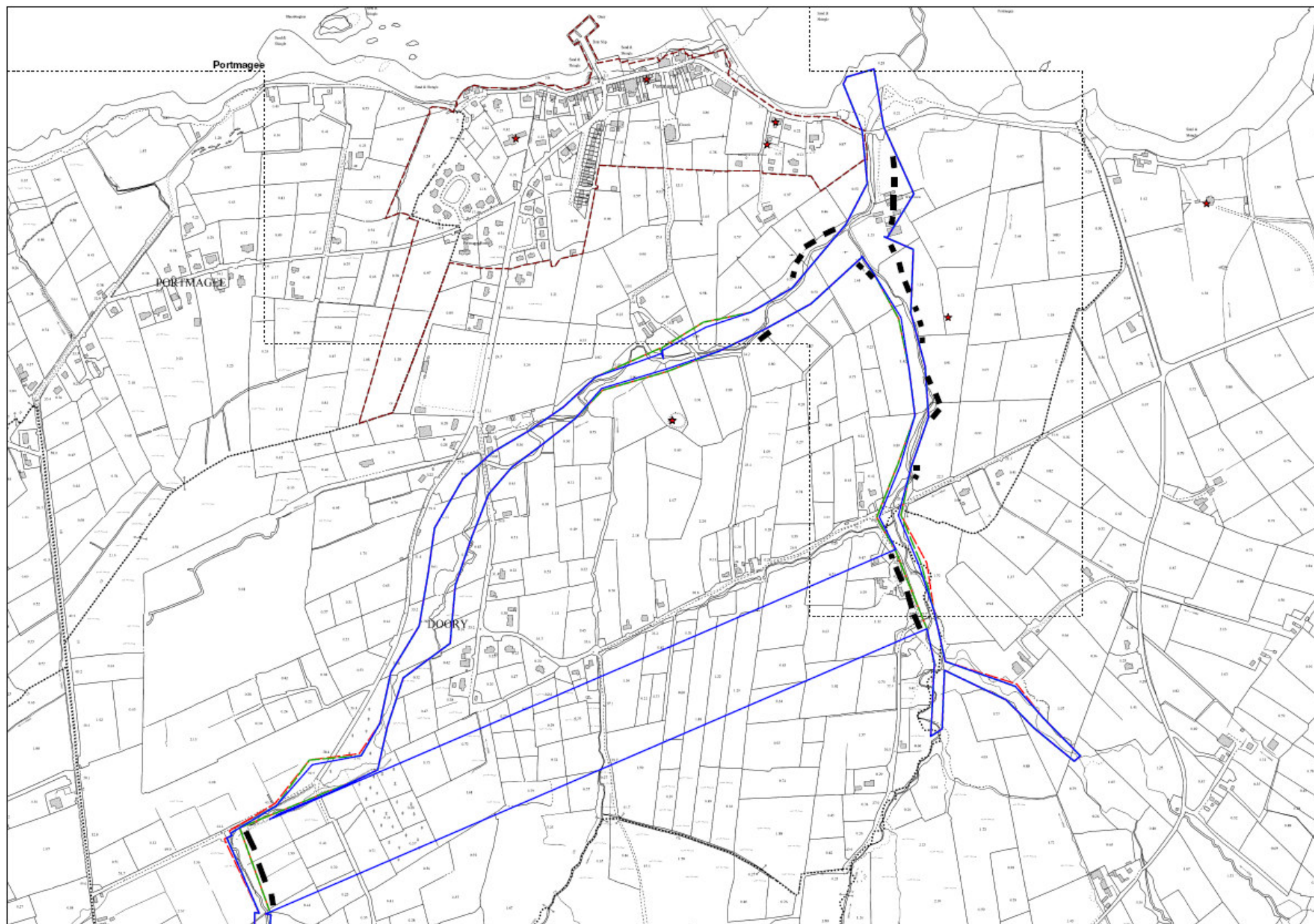
Site Visit Findings:

Not AFA.









**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Rathcormack	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180265	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 14/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Influence of the school appears to have been missed <u>VAL COMMENT – R2</u> Flooding an issue. No record of the school being flooded in Rathcormac		
LA Feedback Comments: <u>VAL COMMENT – R1</u> School at Risk, Low Historic Hazard and Risk <u>VAL COMMENT – R2</u> Mixed LA feedback - no strong opinion. Reduce to RR? <u>APP COMMENT – R1</u> Approved – APSR <u>APP COMMENT – R2</u> FRI = 750 (incl 560 Residential) - LA recognise risk, but has doubts over risk to school - Maintain APSR Status <u>OPW REGIONAL ENGINEERS INPUT</u> Flood occurred 30/01/09 and affected school grounds. On enquiry was advised by Guard that similar flood occurred about 20 years ago and 3-4 years ago. Flood came down from minor watercourse to north.		
Floodmaps.ie Information: One flood event recorded on website 1. Rathcormack Co. Cork 30012009 <u>Flood Event 1:</u> On 30 th January 2009, flooding occurred at Scoil Bhride in Rathcormac following a heavy period of rainfall. There were no other properties flooded. The flood was caused due to overtopping of a small stream from the north of the school. A map indicating the school site and streams was included in the		

event record.

Stakeholder Comments:

The Cork County Council Area Engineer advised that the Shanowen River in Rathcormack is a minor stream with low flood risk.

Predictive PFRA Flood Outline:

During the site inspection, it was noted that the stream located north side of the Scoil Bhride school appeared to be dry with the main flow diverted south to a stream west of the school. The stream west of the school had a strong flow and appears to be culverted at the Garda Station. The currently dry stream channel north of school passes east through the town in a culvert to the Church of Ireland church, after which it leads to the Shanowen River. Currently the dry stream is choked with vegetation, but may act as an overflow channel. The flood extent outlines have been amended on the maps attached to this Site Inspection Report.



Dry overflow stream channel at Church of Ireland church Rathcormack.

Receptor Comments:

The school should be included within the flood extent outline, but approximately 9 residential/ commercial premises should be excluded. This leads to an increase in the FRI score of 160, increasing the total FRI score to 910.6.

Evidence of Flooding:

South of the Shanowen River bridge in the town retaining walls have been constructed at the stream bank.



Retaining wall south of Shanowen River bridge in Rathcormack town.



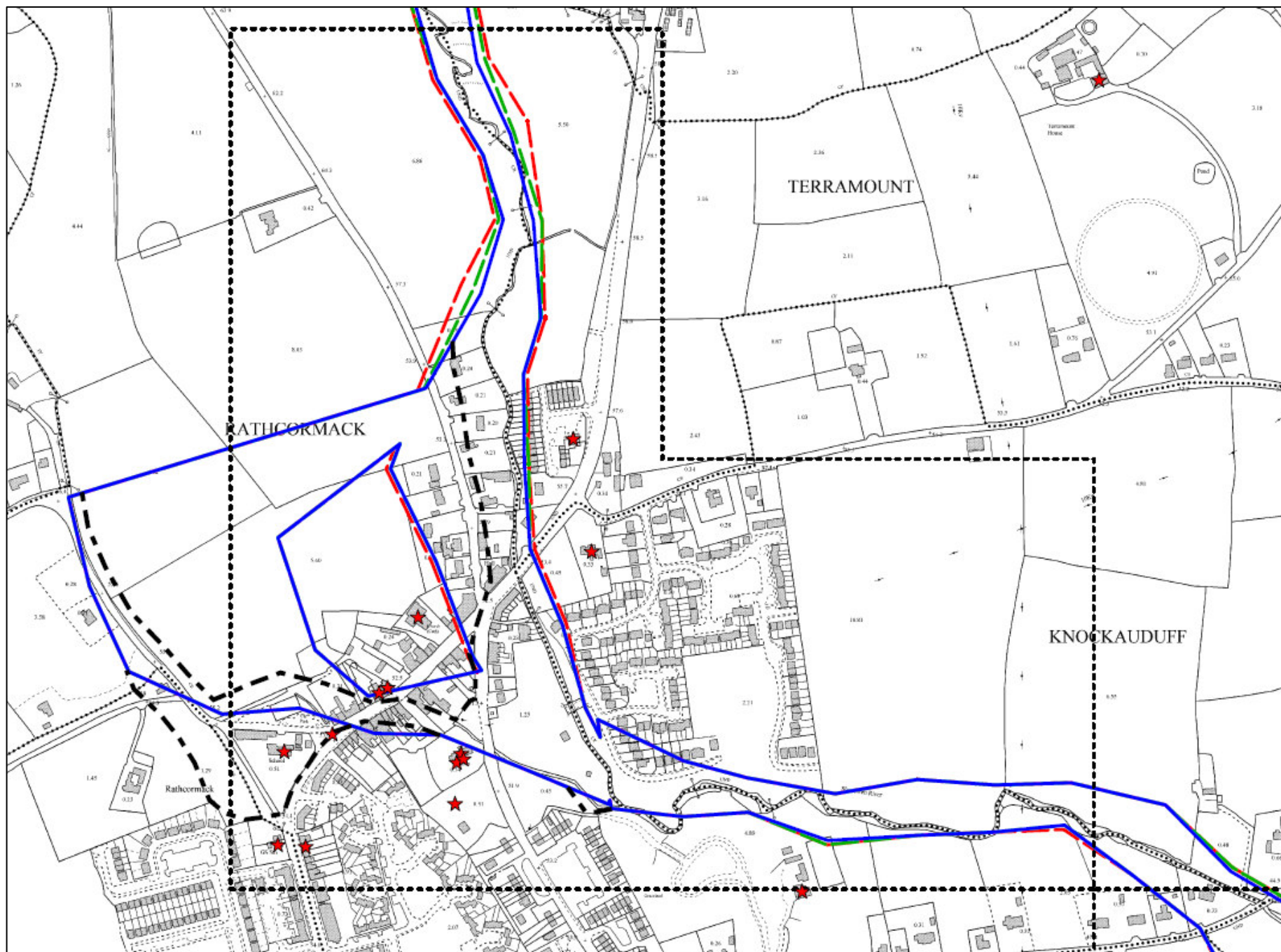
Retaining wall north of Shanowen River bridge in Rathcormack town.

Summary:

The site is an AFA because the impact of the minor streams on the school is significant during high flood flows. Regular maintenance of both the dry stream and the stream to the Garda station should be scheduled to minimise future risk.

Site Visit Findings:

AFA.



Revised Flood Boundary

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Rathmore	Hydrometric Area: 18	County: Kerry
Unique OPW ID: 182363	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Tony Donovan	Date: 13/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Lands and Roads at Risk, Not on Normal Depth Predictive, Local authority requested to be included - no indication of properties at risk <u>APP COMMENT – R1</u> Risk Review – Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Lands and road (N72) at risk at Cullvaw Bridge / Rathbeg. LA asked it to be included		
Floodmaps.ie Information: Under Rathmore, the website contains a number of documents including minutes of meetings, reports on localised flooding, and correspondence. However, a number of the documents appear to be unrelated to the town of Rathmore, Co. Kerry (i.e. some refer to Millstreet, Co. Cork) and the area of this site inspection. There is a report and correspondence in relation to localised flooding at the Cullvavaw Bridge and 2 adjacent properties. However, there are two bridges named Cullavaw Bridge within Rathmore and these documents relate to the bridge which is on the N72 National Secondary Route and is outside of the inspection area.		
Stakeholder Comments: During the site inspection the local Rail Engineer advised that there is no history of fluvial flooding on the railway tracks in this area.		

The Manager of the Bridge Bar (Cullavaw Bridge on N72) was contacted who advised that flooding of the premises was not an issue. During recent heavy rainfall thereThe Manager advised that there was no incidents of flooding of the premises within the past 5 years and was not aware of any prior to this.

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

There is no PFRA boundary for the area or FRI score available for Rathmore. Therefore, the site inspection focused on the area within the Local Authority Development Boundary which encompasses the town of Rathmore.

The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar upstream and through the town. Significant changes do occur downstream over flat agricultural land. Following the site visit it is accepted that such changes could occur for different flood events.

There are a number of small anomalies in the outlines. In one location the 10% AEP exceeds the 1% and 0.1% AEP outlines. Following the site visit the 10% AEP outline has been modified to bring it within the 1% AEP outline.

Upstream of the town the fluvial outlines are shown to cross the railway track for a short section. The site visit confirmed that this is unlikely to occur due to the topography.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report.



Rathmore



Rathmore – view along railway track

Receptor Comments:

Based on the site visit and the modified flood outlines there are 4 residential properties (1 of which is derelict) within the flood risk outlines. This would result in a maximum FRI score of 40 which is well below the threshold score.

Evidence of Flooding:

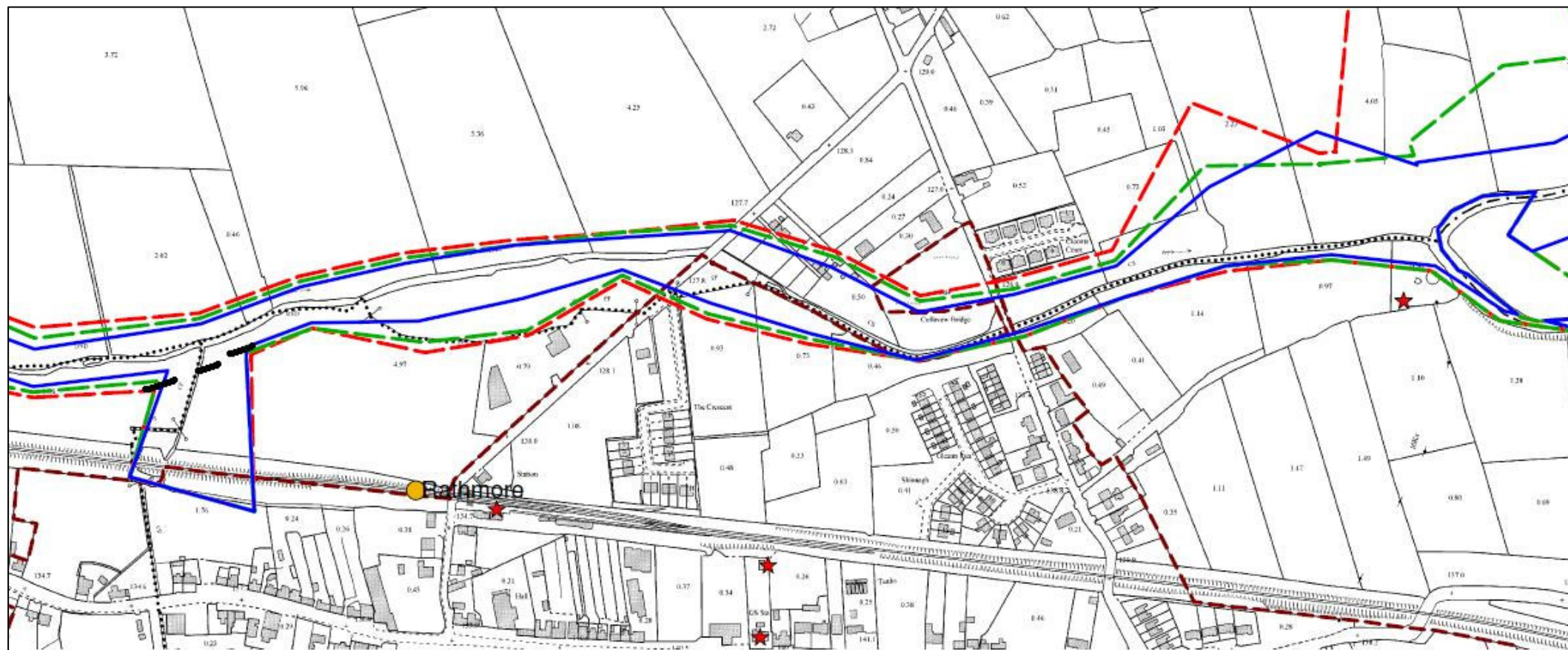
During the site visit there were no visible signs of flooding within the area.

Summary:

The area of inspected was the flood risk outlines within the Local Authority Development Boundary. The site is not an AFA.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Ross Carbery	Hydrometric Area: 20	County: Cork
Unique OPW ID: 200301	Site Type: ARR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 16/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> School in Coastal Flood Plain <u>APP COMMENT – R1</u> Isolated school at risk - Risk Review and possible minor works - Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Tidal School? <u>LA COMMENT – R2</u> Minor coastal flooding. Also pluvial flooding		
Floodmaps.ie Information: The website contains 2 documents. These are a summary report on rainfall and flooding on the 5 th November 2000 and minutes of a meeting between CCC and the ESBI regarding data collection for the OPW Flood Hazard Mapping project. Both documents do not contain any information relevant to Ross Carbery.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: The predicted 10%, 1% and 0.1% AEP fluvial outlines are general similar and appear reasonable. There are no obvious anomalies such as wedges. However, there are some alignment issues between the flood outlines and the river centreline.		

The more significant alignment issues occur to the north east where the flood extent includes a Primary School. The site visit corrected this outline and determined that the Primary School is elevated well above the river bank and not at risk from flooding.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report. No changes are recommended to the coastal outlines.



Ross Carbery



Ross Carbery

Receptor Comments:

The initial FRI score for Ross Carbery is 496.01. Based on the PFRA data provided the main contributor to this score is the Primary School which was within the 10% AEP fluvial flood risk outline.

Based on the site visit the fluvial flood outlines have been modified and the Primary School has been identified as being well above the flood extent and not at risk.

The OPW and LA comments identify the Primary School as at risk due to coastal flooding. However, the school is not within the predicted coastal outlines provided and this is confirmed by the site visit.

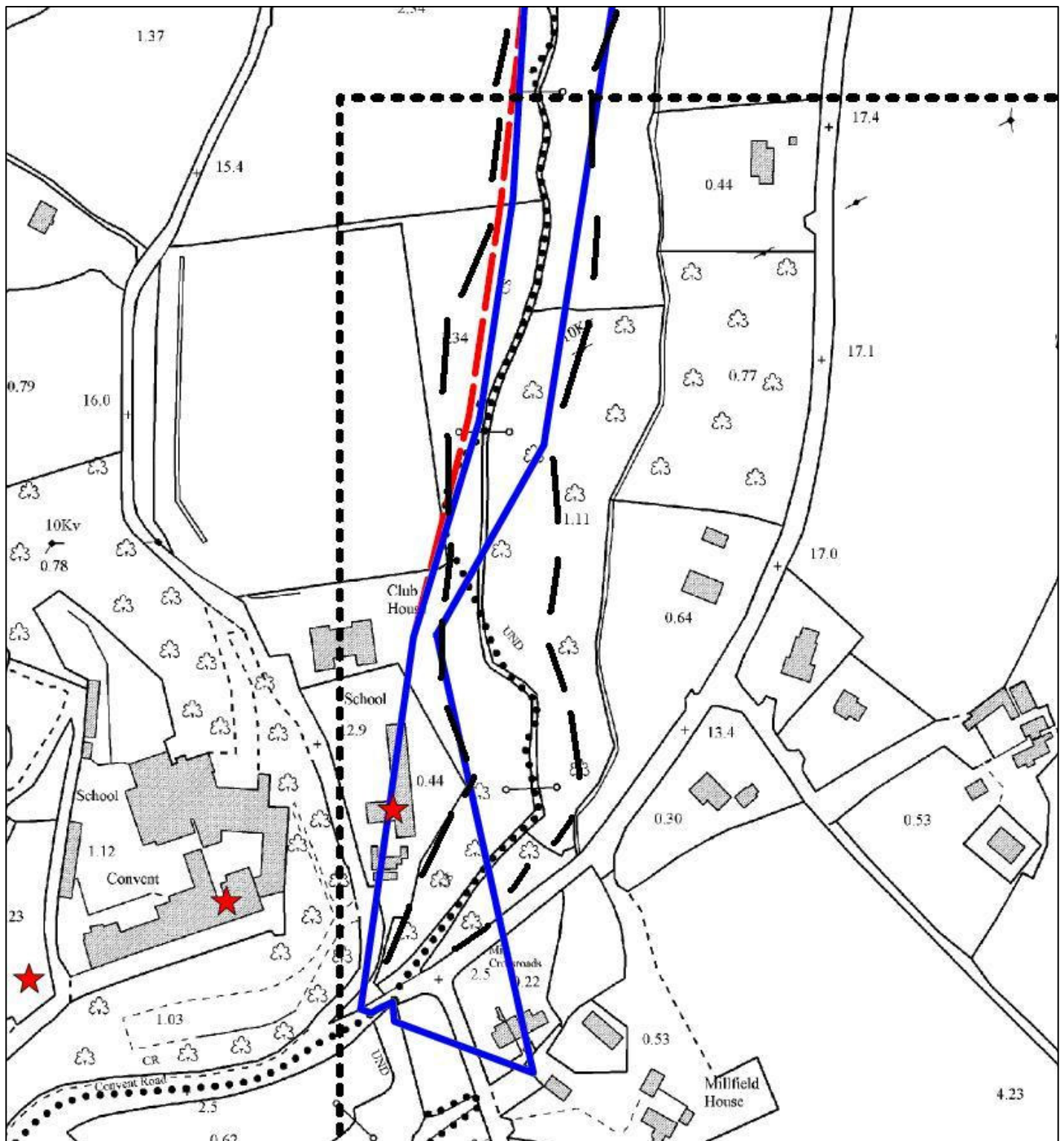
The revised FRI score for Ross Carbery is 225.91 which is below the threshold score. This score includes the initial score of 175.91 from tidal flooding and 50 for 5 residential / commercial properties identified as being within the 10% AEP fluvial flood outline. Based on the revised FRI score the site is not an AFA.

Evidence of Flooding:

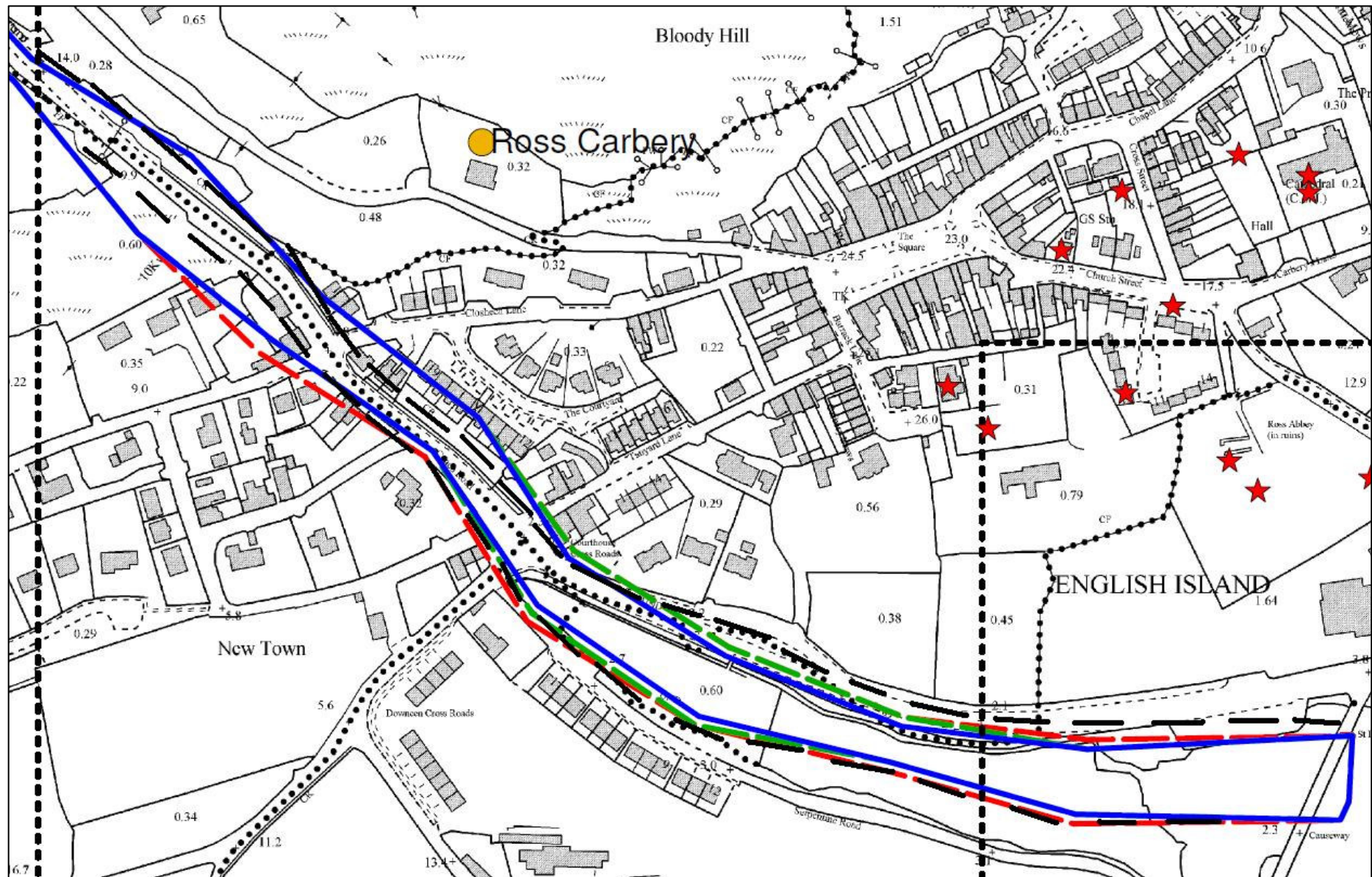
During the site visit there were no visible signs of flooding within the area. The Principal of the local Primary School confirmed that there is no history of the school flooding and was not aware of any flooding issues in the area.

Summary:
The fluvial flood risk outlines have been modified. The FRI score has been reduced as the Primary School is outside the fluvial flood risk outlines. Therefore, the site is not an AFA.
Site Visit Findings:
Not AFA.

Ross Carbery South: revised outlines



Ross Carbery North: revised outlines



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Rossbehy	Hydrometric Area: 22	County: Kerry
Unique OPW ID: 222623	Site Type: ARR	Source of Flooding: Tidal
Surveyor: David Murphy	Date: 15/12/2011	
OPW PFRA Comments <u>VAL COMMENT - R1:</u> OPW Region Severity = 4 <u>APP COMMENT R1:</u> Some historic risk - Risk Review - Not an APSR		
LA Feedback Comments: None		
Floodmaps.ie Information: A flood event is noted in relation to wash over and erosion of the road at the beach area. Two other events are noted but these relate to the Glenbeigh risk review area rather than Rossbehy.		
Stakeholder Comments: The LA were contacted in relation to flooding in the Rossbehy area and staff advised that problems in this area were in the Faha, Kilnabrack Lower and Reennanallagane townlands and these are dealt with in a separate report for Glenbeigh. Piers and Harbour staff did however highlight concerns in relation to the spit (also discussed in the Glenbeigh report). The spit is suffering from erosion with staff estimating approximately 50-60 acres of spit being eroded in recent times. It is feared that erosion of the spit will mean less dissipation of wave action and possible increase in flood risk to houses in the area. Staff also mentioned a study being undertaken by the Hydraulics and Marine Research Centre (HMRC) in UCC in relation to the possibility of rehabilitation of the spit.		

Predictive PFRA Flood Outline:

The 10%, 1% and 0.1% flood outlines are broadly similar for the RR area and from on site assessment, these appear to be consistent with the topography of the land.

The predicted PFRA tidal flood boundaries do not appear to affect any properties and this is in agreement with the assertion in the floodmaps.ie report that the problem is related to wave action near the spit road rather than high tides affecting residential properties.

Receptor Comments:

From the site visit, it is evident that the majority of houses in the Rossbehy village area are high enough that they will not be affected by extreme tides.

A fast food outlet, a public toilet block and a playground appear to be at the lowest elevations in the village but are still above normal high tide level as indicated in the photo below:



Fast food and toilet block (single building) adjacent to beach area.

These were also outside the predicted 10%, 1% and 0.1% flood boundaries.

Evidence of Flooding:

No evidence of flooding noted or bank over topping was observed.

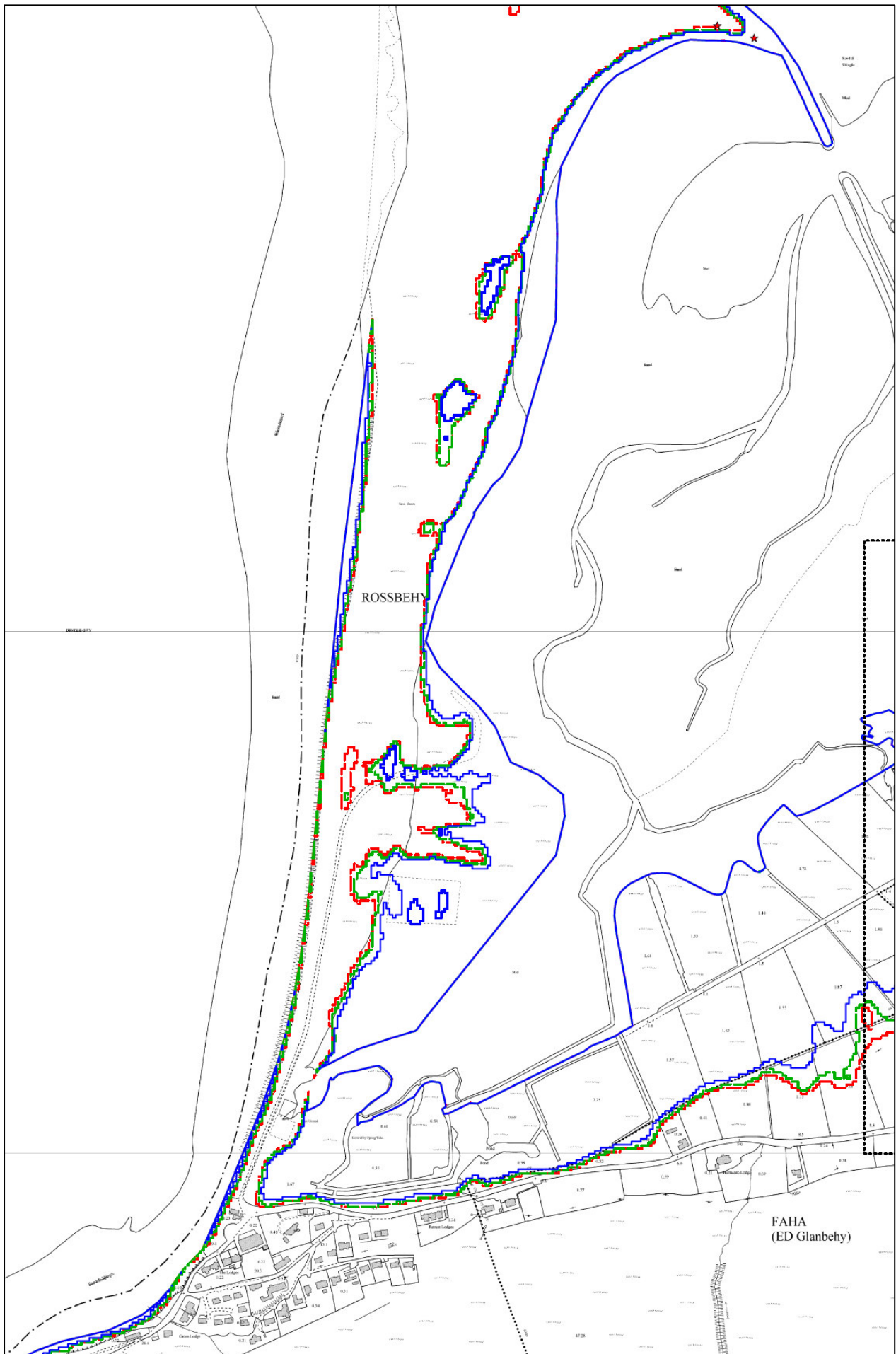
Summary:

It appears that properties in this area are generally not at risk of flooding due to high tides. Those identified at a lower elevation may be at risk from wave action but it is thought that a further assessment is not required.

Lower lying properties near Faha, Kilnabrack Lower and Reennanallagane townlands are risk and these are discussed in the Glenbeigh report.

Site Visit Findings:

Not AFA.



Tidal flood outline (No changes proposed)

**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Schull	Hydrometric Area: 20	County: Cork
Unique OPW ID: 200303	Site Type: CAR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 15/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> High FRI Score >>250 <u>APP COMMENT – R1</u> Approved APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> Surface water run-off with properties <u>LA COMMENT – R2</u> Flooding an issue. Pluvial only		
Floodmaps.ie Information: The website contains 3 documents comprising of two newspaper clippings and minutes of a meeting. The newspaper clipping refer to the flood event of October 2009. The minutes relate to a meeting between CCC and the ESBI regarding data collection as part of the OPW Flood Hazard Mapping project. However, the minutes do not contain any information relevant to the town of Schull.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: Through the town the river flows through a culvert. For the majority the section the culvert is open with a short closed section running under the road at one point. The culvert typically runs through the rear of private properties and is not		

easily accessible.

Overall the fluvial flood risk outlines appear reasonable. However, there appears to be some minor alignment issues between the river centre line and the flood outlines. The wider extent of the flood outlines to the south of the river reflects the nature of the topography with the town sloping away to the south.

The flood risk outlines have been modified to reflect the topography which has resulted in removal of a few properties.

Based on the site visit the PFRA fluvial outlines in this area have been amended as shown in the map attached to this Site Inspection Report. No changes are recommended to the coastal outlines.



Schull – view of the river upstream of the town.



Schull – view of the river downstream of the town.

Receptor Comments:

The majority of the receptors within the flood outlines are commercial properties. Many appear to have private dwellings on the upper floors. Within the fluvial flood risk outlines over 40 commercial properties have been identified with the 10% AEP. As a result the FRI score is 400 and well above the threshold score.

Evidence of Flooding:

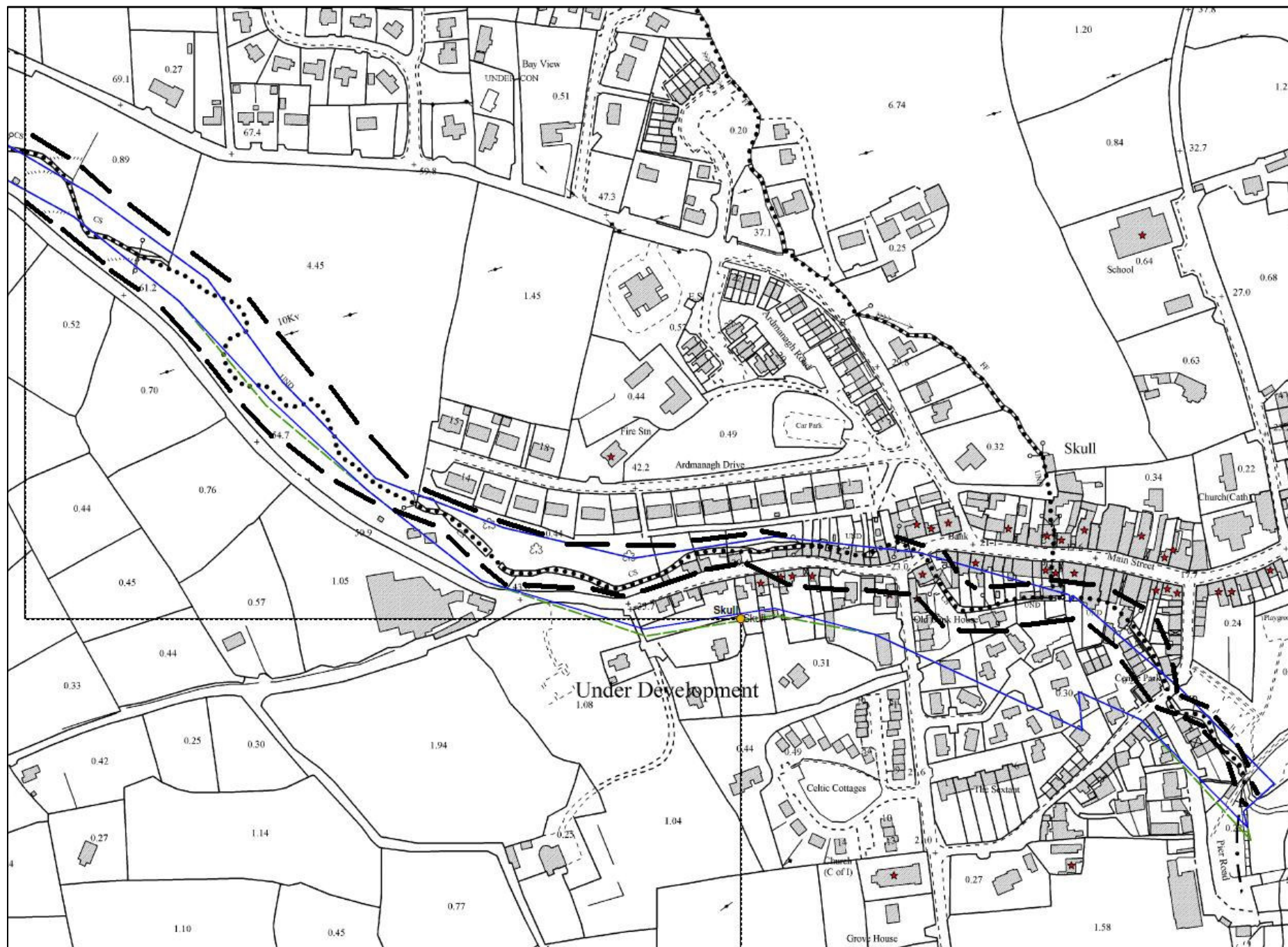
During the site visit there were no visible signs of flooding within the area. Many locals and business owners gave accounts of the flood during October 2009. However, none of the locals or business owners could recount a similar event in the past.

Summary:

The site is an AFA as over 40 commercial properties are within the 10% AEP.

Site Visit Findings:

AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Sneem	Hydrometric Area: 21	County: Kerry
Unique OPW ID: 212577	Site Type: ARR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 12/12/2011	
OPW PFRA Comments: Sneem is identified as having a historic flood risk in the PFRA final Database		
LA Feedback Comments: There is no feedback from the LA recorded on the PFRA database.		
Floodmaps.ie Information: The website contains only minutes of a meeting between KCC and ESBI. Minutes (24/02/2006) – the minutes contained on the website relate to a meeting between KCC and ESBI regarding source body data for the Kenmare area as part of the OPW Flood Hazard Mapping Phase 1 Project. The minutes identify 12 areas of flooding and provide Flood ID Numbers for each area. Details of one event relevant to Sneem are provided below: “12 Moulagullane – North of Sneem Village (Flood ID – 4711) Stream overflows flooding Sneem Sports Field and road. Land on other side of road from sports field also affected. Road is impassable – maximum depth of water is 300mm. No houses affected. Maximum duration of flooding is 1 day. Frequency 1/2 times per year. “		
Stakeholder Comments: KCC provided a report on the “Sneem Area Flood Relief Pre-feasibility Study” along with details of previous flood events. KCC advised of the local concern regarding flooding in the area.		
Predicted Flood PFRA Outline comments: There is no predictive PFRA boundary for the area or FRI score. Therefore, the site inspection focused on the area within the Local Authority Development Boundary which encompasses the town of Sneem. The predicted 10%, 1% and 0.1% AEP fluvial outlines are generally similar and		

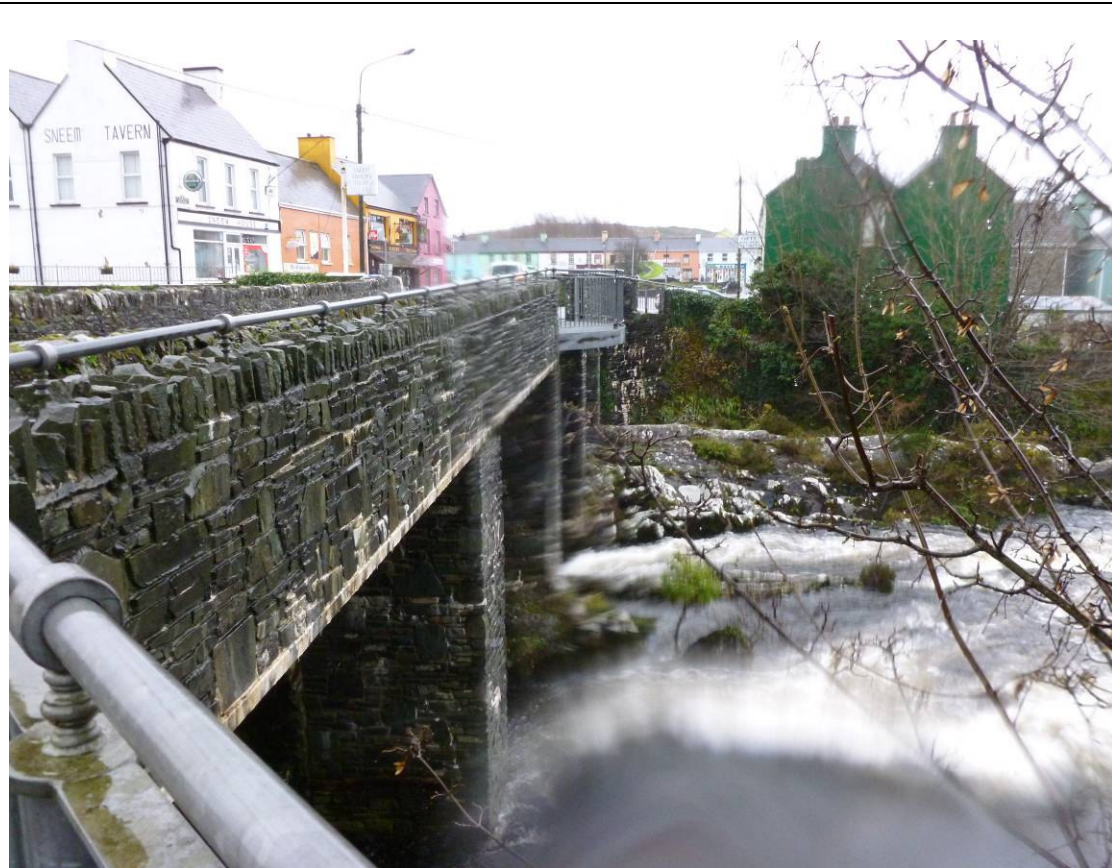
there appears to be no major anomalies. However, the 1% and 0.1% AEP fluvial outlines are shown to extend through the estuary to the south west of the town. From the site visit, it is confirmed that this section of outline can be removed.

Based on the topography observed during the site visit it would appear that the fluvial outlines have over estimated the extent of flooding for the 10%, 1% and 0.1% AEP events. The difference in height between the river bank and the surrounding lands to the north of the bridge are significant, in excess of 5m. The outlines have been modified to reflect the topography.

Based on the site visit the PRFA fluvial outlines in this area have been amended as shown in the attached map included in the Appendix to this Site Inspection Report. No changes are recommended to the coastal outlines.



Sneem – view of river upstream of town.



Sneem – view of river downstream of town.

Receptor Comments:

As mentioned above, there is no FRI score available for Sneem from the PFRA. However, based on the site visit and the modified flood outlines there are no receptors within the flood risk outlines.

Evidence of Flooding:

Due to the lack of information for Sneem from the PFRA stage, this inspection focused on the predicted flood outlines within the Local Authority Development Boundary. During the site visit there were no visible signs of flooding within the area. Discussions with locals and business owners of properties shown within the flood outlines indicated that no flooding has occurred in these areas. The predicted flood extents for this area were found to be over estimated and no receptors were identified as at risk.

Sneem Area Flood Relief Pre-Feasibility Study

KCC provided a report on flooding within the vicinity of Sneem. This report focused on an area of recurring flooding issues to the north west of the town, outside of the development boundary. The report identified that flooding occurs when the river bursts its bank at a point where the river takes a 90 degree bend. Based on historical and anecdotal evidence the report states that 20 residential / commercial properties along with a WWTP are possibly at risk. As

part of the study, fluvial hydraulic modelling was undertaken which also identified the 20 residential / commercial properties and the WWTP as possibly at risk.

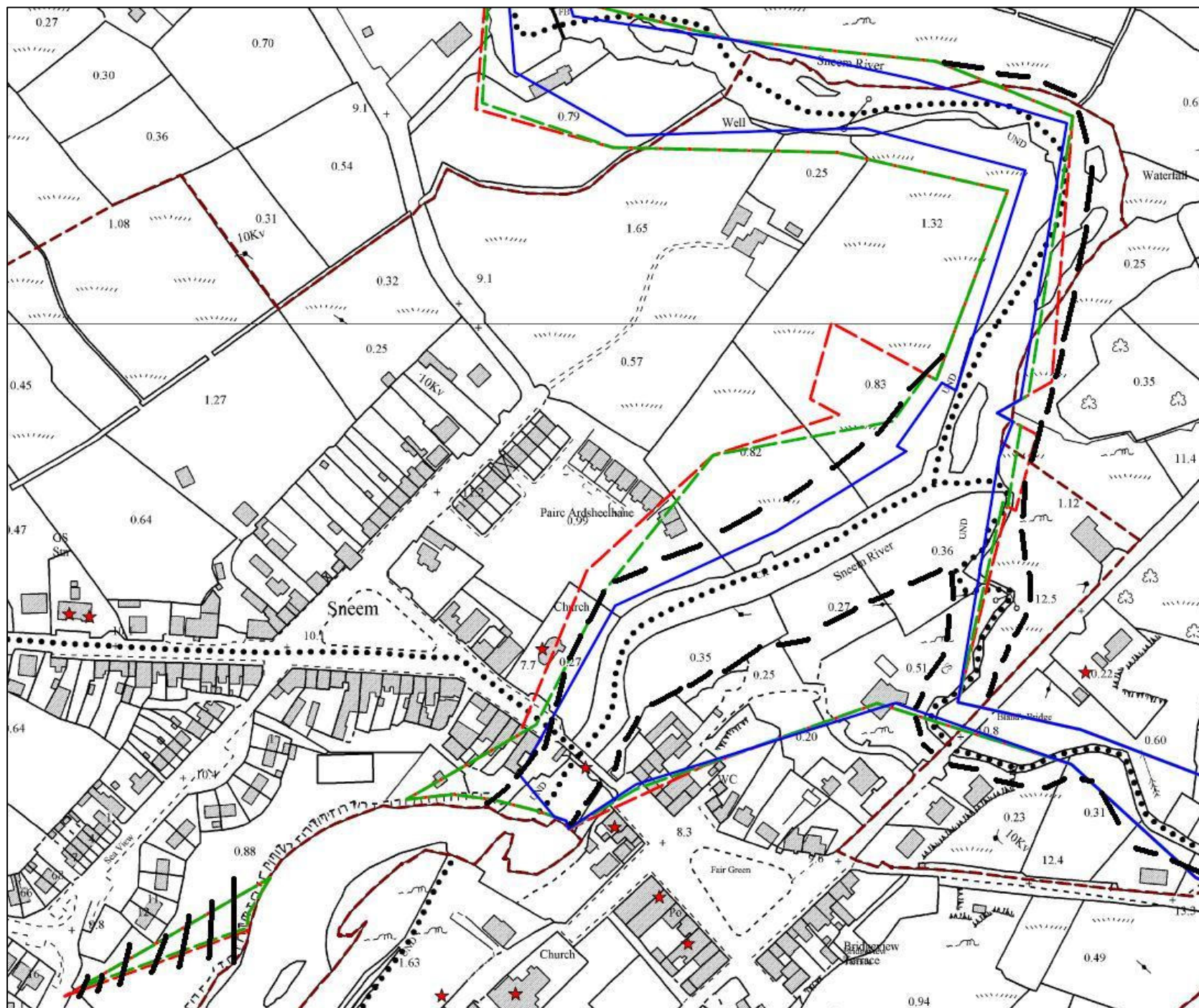
While the entire area of the study was not included in this site inspection, if a weighting was to be applied to the receptors identified as possibly at risk, this would result in a score of 225. This score is below the threshold and would not result in the area being defined as an AFA.

Summary:

The area inspected was the flood risk outlines within the Local Authority Development Boundary. The site is not an AFA due to no receptors within the flood risk outlines.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Tallow	Hydrometric Area: 18	County: Waterford.
Unique OPW ID: 180226	Site Type: CAR	Source of Flooding: Fluvial
Surveyor: John O' Riordan	Date: 13/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Wedges in Model, Low Historic Risk and Hazard, High FRI Score <u>APP COMMENT – R1</u> Approved - APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No Property Flooding reported Could be a risk, need to ask area engineer. Risk driven primarily by residential, but smaller commercial and pollution source. <u>LA COMMENT – R2</u> At junction of Cockpit lane and West Stream in Tallow town at least 8 properties flooded in one incident in the last year (Glenaboy River)		
Floodmaps.ie Information: One flood event is recorded on the Floodmaps.ie website for Tallow: 1. Flood Event: Bride Tallowbridge recurring. This flood event records is within the risk review area on the overview map for Tallow. Minutes of meeting with Waterford County Council (WCC) Lismore Area Engineer and District Overseers in 2006 to identify location vulnerable to regular or historic flooding in the Lismore district, also identified the following areas subject to flooding within the overview map for Tallow. <ul style="list-style-type: none"> • River Bride at Tallowbridge. Due to a combination of high tides and rainfall, flooding causes the R634 regional road to be regularly impassable. (Flood ID 3850). 		

Stakeholder Comments:

The Waterford County Council personnel interviewed were aware of flooding in the area of the overview map for Tallow. The following is noted:

Tallow Bridge/R534 Regional Road:

The Local Authority confirmed that fluvial flooding occurs on the River Bride at the location of the Tallow Bridge. The R634 regional road and the residential and commercial properties adjacent to the Tallow Bridge are vulnerable to flooding. The Area Engineer recalls that the newly construction residence adjacent to the River Bride was flooded during a previous major flood event a number of years ago. From discussions with two other Waterford County Council employees local to the area they confirmed that the Regional Road R634 between the Tallow Bridge and Tallow Town were previously flooded a few years ago.

Bridges within Tallow Town:

The Area Engineer confirmed that flooding occurs to West Street and Cockpit Lane within the town during times of major flooding. He confirmed that when the bridge within the town cannot take the flow from the tributary river then the area becomes blocked causing the adjacent properties to be flooded.

Predictive PFRA Flood Outline:

From the site visit it would appear that some sections of the predicted outlines within Tallow are not representative of the local topography and historical flood events that occurred in the area.

Some sections of the predicted outlines within Tallow appear to be under estimating flood risk in this area. The amendment to the outlines includes approximately 12 residential and commercial properties to the Flood Risk Index (FRI).

Based on the site visit the PFRA outlines for Tallow have been amended as shown in the map attached to this Site Inspection Report.



River Bride – Tallow Bridge



Bridge within Tallow - West Street

Receptor Comments:

Adjusting the AEP flood outlines within Tallow, based on the site visit includes a total of 12 residential and commercial properties to the FRI. The total addition of residential and commercial receptors in this area increases the score by a maximum of 120.

The overall amendments of the Flood Risk Outlines lead to an increase of 120 points to the Flood Risk Index total. This increases the FRI score from 617.8 to 737.8.

Evidence of Flooding:

From the time of the site visit there appeared to be no evidence of fluvial

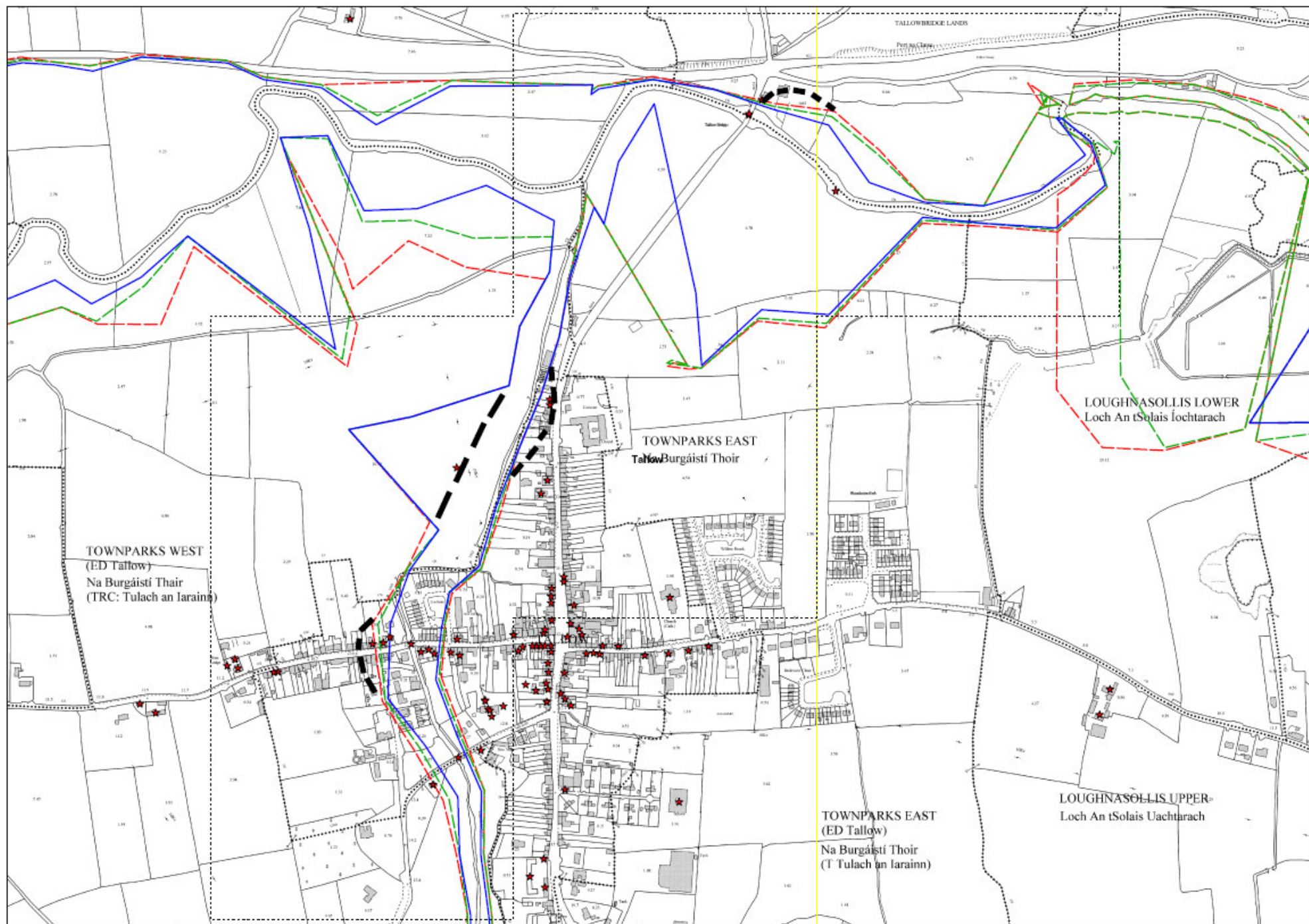
flooding within the risk review area for Tallow.

Summary:

The Site is as an AFA as the FRI score for Tallow is above the 250 score threshold.

Site Visit Findings:

AFA.





**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Templenoe	Hydrometric Area: 21	County: Kerry
Unique OPW ID: 210315	Site Type: ARR	Source of Flooding: Fluvial & Coastal
Surveyor: Tony Donovan	Date: 12/12/2011	
OPW PFRA Comments: <u>OPW COMMENT</u> No comment <u>VAL COMMENT – R1</u> Major Wedge in Model <u>APP COMMENT – R1</u> Errors in predictive flood extents – Risk Review – Not an APSR		
LA Feedback Comments: <u>LA COMMENT – R1</u> No comment		
Floodmaps.ie Information: The website contained no information in relation to flooding at Templenoe.		
Stakeholder Comments: The Local Authority had no specific issues in relation to this site.		
Predictive PFRA Flood Outline: There appears to be major errors in the predicted 10%, 1% and 0.1% AEP fluvial outlines. A significant wedge stretches off to the west which is responsible for the vast majority of the scores in the FRI. Furthermore, there appears to be alignment issues which are evident when the outlines are compared to the river alignment on OSI maps. The site visit would also indicate that the wedge appears to be an error. While in parts the bank of the river is low, the topography of the surrounding lands would not result in a flood outline as shown in the predicted outlines. Based on the site visit the PFRA fluvial outlines in this area have been amended		

as shown in the map attached to this Site Inspection Report. No changes are recommended to the coastal outlines.



Templenoe



Templenoe – view of river passing through private garden.

Receptor Comments:

The amendment of the fluvial flood risk outlines has confirmed the removal of over 13 residential / commercial properties. This results in the reduction of the FRI score to a score lower than the threshold score.

Evidence of Flooding:

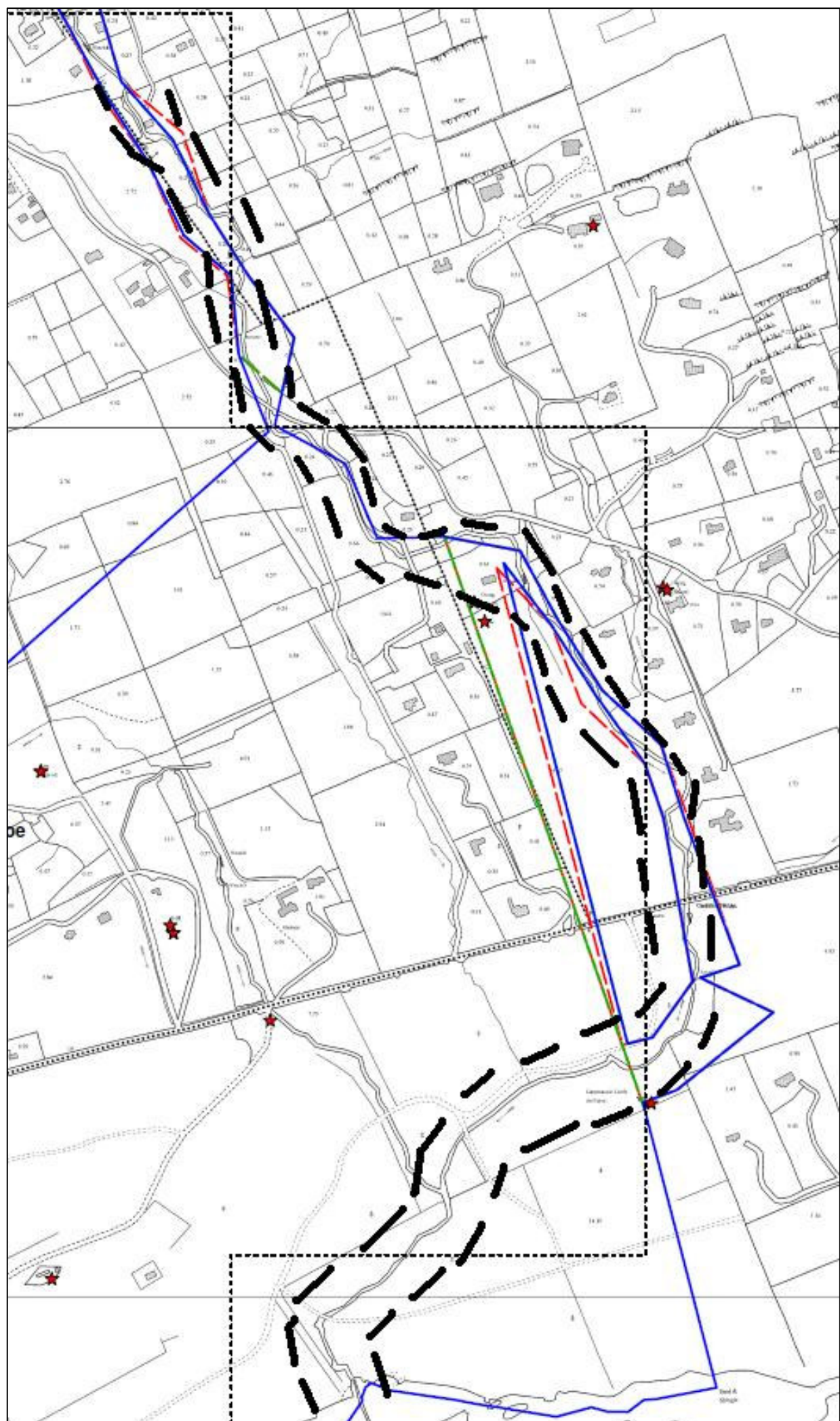
During the site visit there were no visible signs of flooding.

Summary:

The site is not an AFA due to the removal of the wedge in the fluvial flood outlines and the subsequent reduction in the FRI Scores.

Site Visit Findings:

Not AFA.



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Twopothouse	Hydrometric Area: 18	County: Cork
Unique OPW ID: 180264	Site Type: ARR	Source of Flooding: Fluvial
Surveyor: Mark Cotter	Date: 12/12/2011	
OPW PFRA Comments: <u>VAL COMMENT – R1</u> Low Historic Hazard and Risk, No Feedback from LA, Low FRI score <u>VAL COMMENT – R2</u> LA requested RR at second workshop - new development close to river <u>APP COMMENT – R1</u> Not an APSR <u>APP COMMENT – R2</u> Include for Risk Review		
LA Feedback Comments: <u>LA COMMENT – R2</u> New development backing onto river. Risk Review requested.		
Floodmaps.ie Information: No flood events recorded on the website.		
Stakeholder Comments: Contacted Cork County Council Area Engineer by phone 12/12/2011. The Area Engineer asked for a copy of the PFRA flood maps for review. <u>Residents Discussion 1 – Owner of Palmer’s Quik Pick Post Office and shop</u> Owner’s recalled that the field along side the playschool floods, but the roads do not flood. Owner mentioned that the new development owner O’Flynn’s undertook drainage remedial work along the stream when constructing the development and the new development does not flood.		
Predictive PFRA Flood Outline: From the site visit, it would appear that the flood extent outline is exaggerated at the east side of the village. Ground levels in the new development appear		

to have been raised during construction.

Based on the site visit the PRFA outlines have been amended as shown in the map attached to this Site Inspection Report.

Receptor comments:

The amendment of the flood extent outline has confirmed that 9 residential/commercial properties remain within the flood extent outlines. This would lead to a total in the residential and commercial fluvial FRI score of 90 and would reduce the total FRI score from 190.1 to 90.

Evidence of Flooding:

There is a masonry wall separating the new residential development near the N20 national road from the stream.



Masonry wall separating the new development from the stream



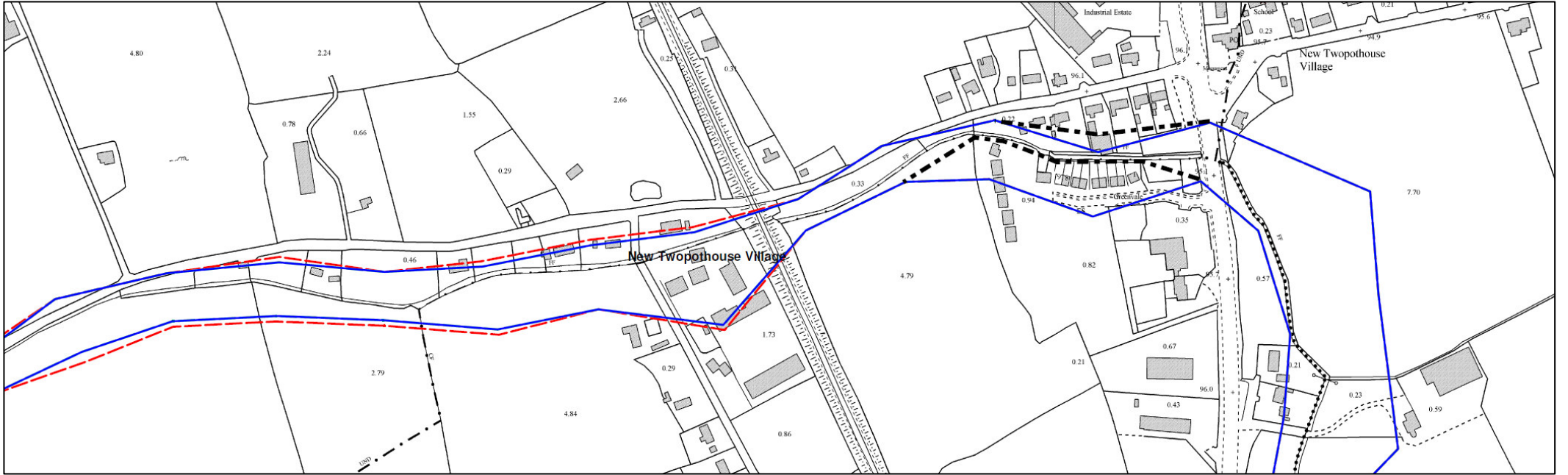
Stream at west side of village

Summary:

This site is not an AFA because the amount of properties at risk is relatively low.

Site Visit Findings:

Not AFA.



Revised Flood Boundary



**SWRBD CFRAM Study
Flood Risk Review Site Inspection Report**

Name: Youghal	Hydrometric Area: 18/19	County: Waterford/Cork.
Unique OPW ID: 180267	Site Type: CAR	Source of Flooding: Fluvial and Coastal
Surveyor: John O' Riordan	Date: 12/12/2011	
<p>OPW PFRA Comments:</p> <p>Waterford: Youghal: <u>VAL COMMENT – R1</u> Coastal Risk, annual event, Low historic risk and hazard</p> <p><u>APP COMMENT – R1</u> Approved – APSR</p> <p><u>VAL COMMENT – R2</u> Cork side is also affected</p> <p><u>APP COMMENT – R2</u> Comment only in relation to county boundary - Maintain as APSR</p> <p>Cork: Youghal S (Claycastle): <u>VAL COMMENT – R1</u> FRI Score < 250, No concerns expressed by LA or OPW Region</p> <p><u>APP COMMENT – R1</u> Not an APSR</p> <p><u>VAL COMMENT – R2</u> Youghal in database in Waterford. Is in as APSR</p> <p><u>APP COMMENT – R2</u> GG - Maintain status of APSR, but as part of Youghal APSR - GG to be include note to Table 1 in tender docs that this area is part of Youghal APSR & Incl map for Claycastle in info provided to tenderers - Then re-set APP Code R2 to 3</p>		
<p>LA Feedback Comments:</p> <p>Waterford: Youghal: <u>LA COMMENT – R1</u> Linear Town, some land back street (Quay)Once per year 2004/1963No IRR; Town Hall Fire Station at risk</p>		

LA COMMENT – R2

Cork is also affected.

Cork: Youghal S (Claycastle):

LA COMMENT – R1

None

LA COMMENT – R2

Youghal not recorded anywhere else on the list so flagging it here as should be an APSR. _South Claycastle to be included with Youghal. Linear town, some land back street (quay). Once per year 2004/1963. No IRR, Town hall, Fire station at risk.

Floodmaps.ie Information:

Five flood events are recorded on the Floodmaps.ie website for Youghal:

1. Flood Event: Youghal Town Oct 2004
2. Flood Event Claycastle Beach, Youghal, Co. Cork Oct 2004
3. Flood Event Youghal Flooding Front Strand Oct 2004
4. Flood Event Youghal Mudbanks, Co. Cork February 1985
5. Flood Event Youghal mar 1962

All of the above flood event records are within the risk review area on the overview map for Youghal.

Minutes of meeting with Cork County Council (CCC) Youghal Area Engineer in 2005 to identify locations vulnerable to regular or historic flooding in the Youghal district, also identified the following areas subject to flooding within the overview map for Youghal.

- Coastal flooding Youghal town 27th October 2004, caused by extreme high tides combined with an extreme wind surge. Road and property flooding and damage. Photos of numerous areas and maps indicating extent of flooding. (Flood ID 1419).
- House and land flooding in vicinity of Youghal Mudlands adjacent to the River blackwater estuary. Heavy rainfall on 6/7th February 1985 caused land flooding. Drainage from the land is effected through a sluice that discharges to the River Blackwater estuary. Recurring (Flood ID 3741).
- Coastal Flooding at Claycastle beach area 27/10/2004 due to high tides, extreme winds/wave action. Photo of aftermath showing some flood debris marks. (Flood ID 3852).
- Land flooding in vicinity of Crompaun Bridge. Flooding upstream and downstream on both sides of bridge. Womanagh River. (Flood ID 2208).
- Coastal Flooding at Front Strand area 27/10/2004 due to high tides, extreme winds/wave action. Photo of aftermath showing some flood debris marks on roadway, promenade and green area. (Flood ID 3853).

Stakeholder Comments:

The Local Authority had no specific issues in relation to this site.

Predictive PFRA Flood Outline:

From the site visit it would appear that the AEP outlines within Youghal are reasonable representative of the local topography and historical flood events that occurred in the area.

The PFRA outlines for Youghal are shown in the map attached to this Site Inspection Report.



Youghal – Front Strand



Youghal – Front Strand carpark & promenade



Youghal – Pier



Youghal – Quay

Receptor Comments:

As no proposed amendment are required to the predicted outlines the below, the current FRI scores are considered appropriate:

Waterford: Youghal: FRI = 2711.77

Cork: Youghal S (Claycastle): FRI = 181.26

Evidence of Flooding:

From the time of the site visit, the only evidence of coastal flooding within the risk review area for Youghal was the presents of washed up debris in the Front Strand car-park and promenade, adjacent to the line of residential properties.

It was further noted that there appeared to be evidence of water marks present on the outside of some buildings within the town adjacent to the piers/coast where previous flooding had occurred.

Summary:

The site is an AFA as the FRI score for Youghal is above the 250 score threshold.

Site Visit Findings:

AFA.

