

Location: Foynes, Co. Limerick		Unique ID: 240383 (from PFRA database)	
Initial OPW Designation	APSR <input checked="" type="checkbox"/>	AFRR <input type="checkbox"/>	IRR <input type="checkbox"/>
Co-ordinates	Easting: 125000	Northing: 151500	
River / Catchment / Sub-catchment	Robertson River/ Coastal		
Type of Flooding / Flood Risk (identify all that apply)	Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input checked="" type="checkbox"/> Coastal <input checked="" type="checkbox"/>		

Stage 1: Desktop Review	
1.1 Flood History (include review of Floodmaps.ie)	<p>River Flow Path / Area Detail</p> <p>Foynes is located on the Shannon Estuary, with the Robertson River lying some distance (1km) NE discharging to the Shannon Estuary. There several streams running through and adjacent to the Foynes area (EPA stream order 1-2) discharging to the Shannon Estuary and Robertson River. The N69 route within the Foynes Town is a flood problem area and there are a number of channels/stream adjacent to the route.</p> <p>Flood event records</p> <p>Seven flood records are listed – 3 of which are singular events and the other 4 are recurring flood events. Two recurring events are located South of Foynes outside the main town area along the N69.</p> <p>There are two elements to the flooding here:</p> <ul style="list-style-type: none"> rainfall/runoff combined with inadequate culvert capacity/storage flooding due to high tides. <p>Flooding occurred in January 2005, 23rd January 2002 and 23rd February 1995 due to severe rainfall.</p> <p>The second problem is caused by high tides, low pressure and strong south westerly winds. In this case high tides overtop the port quay wall, and water then flows SW across the railway line and into the rear of a number of properties along main street causing severe flooding to premises. It flows through and around houses onto the main street flooding the N69 partially blocking the road. The most severe tidal flooding to date occurred on February 1st 2002.</p>
1.2 Relevant information on flooding issues from OPW and LA staff	<p>PFRA database comments (<i>in italics</i>):</p> <p>OPW comments <i>Frequent flooding of residential property, OPW undertook improvement works in 2008.</i></p> <p>LA comments <i>Town up to 10ft below high tide level, 14ft below embankment level OPW-put in an attenuation area</i></p>

	Meeting / discussion summary comments: OPW comments <ul style="list-style-type: none"> • Complicated catchment and flooding problems. • Tidal problem from the Shannon estuary. • Small flashy steep watercourse entering Foynes. Watercourse cannot discharge during tide-lock conditions. Hence there is a need for storage of the fluvial flows behind the tidal defences. • There used to be embankments protecting Foynes but some of these have been removed as part of the port development. • The town is at approximately 13.5 ft and the embankments are at 27 ft. The 100 year tide level is believed to be around 21-22 ft. • Some upgrading works were completed in 2008. • The works included pipes through the embankment through which to pump water stored behind the defences. Since construction in 2008, pumps have not been needed. The pumps are stored in Limerick. • Tidal flooding is more of a problem than the fluvial flooding. • Tidal flooding will only occur with spring tides/surge. • In terms of solutions, the main issue is where to actually align the defence as it would have significant impacts (potentially) on the operation of the port. LA comments		
1.4 PFRA Data			
1.4.1 PFRA hazard mapping	PFRA mapping available in GIS layer: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> PFRA mapping included on FRR map: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
1.4.2 Summary of Principal Receptors	Type Fire Station Garda Station Health UWWTP Total:	FRI score (if available) 250 25 25 25 6264.5	
1.7 Stage 1 Evaluation	Aspect	Clearly APSR	Uncertain
	Flood History (1.1)	X	
	OPW / LA Information (1.2)	X	
	PFRA Evaluation (1.4)	X	
	Overall Desktop Evaluation (if any above aspect is uncertain then overall designation is uncertain)		X (due to complexities of site)
1.8 Proposed level of assessment for Stage 2 site visits	Level A Site Visit		X
	Level B Site Visit		

Stage 2: Site Inspection		Level A Assessment		
Date and Time of Inspection		Date: 12/04/11		
		Time: 15:00		
Names of inspection team (including OPW/LA staff if present)		Iain Blackwell		
		Kelly Kasperczyk		
2.1 Ground-truthing of Hazard Mapping	Fluvial non-tidal <input checked="" type="checkbox"/> Fluvial tidal <input checked="" type="checkbox"/> Coastal <input type="checkbox"/> Not available <input type="checkbox"/>			
	<p>Potential flood extents indicated by hazard mapping are associated with streams that are now diverted or culverted as part of a recent OPW scheme.</p> <p>Flood hazard extents near the Port Working Dock (north of Ballynacragga North) are uncertain on the western side as the N69 is steep here.</p> <p>The extents on the N69 east of this Dock are uncertain for fluvial flows.</p>			
2.2 Spot check ground-truthing of selected receptor vulnerability	Receptor Type	Location description (if not obvious)	Exists?	Overall Vulnerability / Risk (L / M / H)
(also note any key receptors noted during visit that are not identified by PFRA)	Fire Station		Yes	L - M
	Gárda Station		Yes	
	Health		Yes	L - M
	UWWTP		Yes	M (tidal)
2.3 Local knowledge - on-site comments (OPW, LA and any info volunteered by local residents during visit)	No on site comments			
2.4 Comments on hydraulic constrictions (bridges, etc.) and conveyance routes	Various hydraulic restrictions with culverts and crossings on the small watercourse flowing into Foynes from the surrounding area. The recent (2008) OPW scheme has reduced these issues.			

2.5 SVRS Assessment Matrix

Weightings:

A - x1 - reasonable expectation of flooding

B - x2 - high expectation of flooding
or flooding is tidal (any risk)

C - x5 - risk to life

Approx. Number	1 to 4				5 to 20				>20			
Weighting		A	B	C		A	B	C		A	B	C
Property (domestic)	10				100		X		200			
Property (small retail or business)	20				200				400			
Property (large retail or business)	50				500				1000			
Road or Rail Infrastructure	30		X		300				600			
Critical Infrastructure (local) [hospital, school, police/fire/ambulance station, substation, WTW/WWTW, gov bldg, other (specify)]	50		X		500				1000			
Critical Infrastructure (national importance)	250				1000				2000			
Cultural Heritage Site	20				200				400			
Environmental Designated Site	20				200				400			
Hazardous Substances Site	50				500				1000			
Total SVRS									360			

2.6 Defence Assets

Formal and Informal Flood Defence Assets

(include effective and ineffective assets to inform asset survey and potential mitigation measures)

Open Channel Watercourses

Man-made river channel ☐ Flood relief channel ☒ Canal ☐
Mill leat ☐ Drainage channels / back drains ☒

Bridges and Culvert crossings

Single Arch bridge ☒ Multi-Arch bridge ☐
Single Span bridge ☐ Multi-Span bridge ☐
Box culvert(s) ☒ Pipe culvert(s) ☒ Arch Culvert(s) ☐

Culverted Watercourses (culvert length is greater than just a crossing)

Box culvert(s) ☒ Pipe culvert(s) ☐ Arch Culvert(s) ☐ Irregular Culvert(s) ☐

Walls and Embankments

Embankment(s) ☒ Raised wall(s) ☐ Retaining wall(s) ☐

Control Structures – weirs, gates, dams

Fixed crest weir ☐ Adjustable weir ☐ Dam / Barrage ☐
Sluice gates ☐ Lock gates ☐ Radial gates ☐

Storage

On-line storage (natural) ☒ On-line storage (artificial) ☒ Off-line storage ☐

	<p>Outfalls</p> <p>Flapped outfall(s) into watercourse <input checked="" type="checkbox"/> Unflapped outfall(s) into watercourse <input checked="" type="checkbox"/> <i>i.e. from smaller watercourses, drains etc. into river / estuary / sea</i></p> <p>Tidal flap(s) <input checked="" type="checkbox"/> Tidal sluice(s) <input type="checkbox"/> <i>i.e. from main watercourse into estuary / sea</i></p> <p>Other</p> <p>Pumping Station <input checked="" type="checkbox"/> Erosion Protection <input type="checkbox"/> Sand Dunes <input type="checkbox"/></p> <p>Additional notes (if required):</p> <p>Note that the “pumping station” is not a permanent installation. There is a storage lagoon from which water is pumped through the large tidal embankments. However, the pumps need to be transported from Limerick City.</p>
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2.8 Initial Potential Mitigation Measures

Non-structural measures	<p>Planning and Development control <input checked="" type="checkbox"/></p> <p>Sustainable Urban Drainage Systems <input type="checkbox"/></p> <p>Flood forecasting / warning <input checked="" type="checkbox"/></p> <p>Change in Operating Procedures for water level control: <input type="checkbox"/></p> <p>Public awareness campaign <input type="checkbox"/></p> <p>Individual property protection <input type="checkbox"/></p> <p>Land use management <input type="checkbox"/></p>
Structural measures	<p>Strategic development management for floodplain development: <input type="checkbox"/> <i>(integration of measures into strategic development proposals)</i></p> <p>Storage: On-line <input checked="" type="checkbox"/> Off-line <input type="checkbox"/></p> <p>Flow diversion: Flood relief channel <input type="checkbox"/> Flood relief culvert <input type="checkbox"/></p> <p>Increase conveyance: Bridge works <input type="checkbox"/> Channel works <input type="checkbox"/> Floodplain <input type="checkbox"/></p> <p>Flood defences: Walls <input checked="" type="checkbox"/> Embankments <input checked="" type="checkbox"/></p> <p>Localised works: Defence raising <input type="checkbox"/> In-fill gaps <input checked="" type="checkbox"/> Trash screen <input checked="" type="checkbox"/></p> <p>Maintenance works: Culvert / channel clearance <input checked="" type="checkbox"/> Asset maintenance <input checked="" type="checkbox"/></p> <p>Relocation of properties: <input type="checkbox"/></p> <p>Improve existing defences: <input type="checkbox"/> (describe)</p> <p>Other (describe):</p>

Outcomes

PFRA Designation	APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/>		FRI Score: 6264	
Site Ground-truthing of PFRA Assessment (hazard mapping and receptors)	High Confidence (good)	Uncertain	Low Confidence (poor)	Not available
		X		
Site Visit Review Score	360			
Recommended Designation	APSR <input checked="" type="checkbox"/> not an APSR <input type="checkbox"/> IRR <input type="checkbox"/>			

<p>Summary Comments (if required)</p>	<p>Foynes appears to be at risk from both fluvial flooding from small, rapidly responding catchments as well as tidal flooding.</p> <p>The recent improvement works have reduced the fluvial flood risk through diverting watercourses away from the town and increasing the storage available behind the tidal embankments to receive flood waters when the system is tidelocked.</p> <p>The focus for mitigation works is likely to be around tidal flooding protection due to the major gaps in the defences in the Port area, making the town vulnerable to tidal flooding during extreme events.</p>
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Photo 1: Watercourse (with trashscreen) coming into Foynes



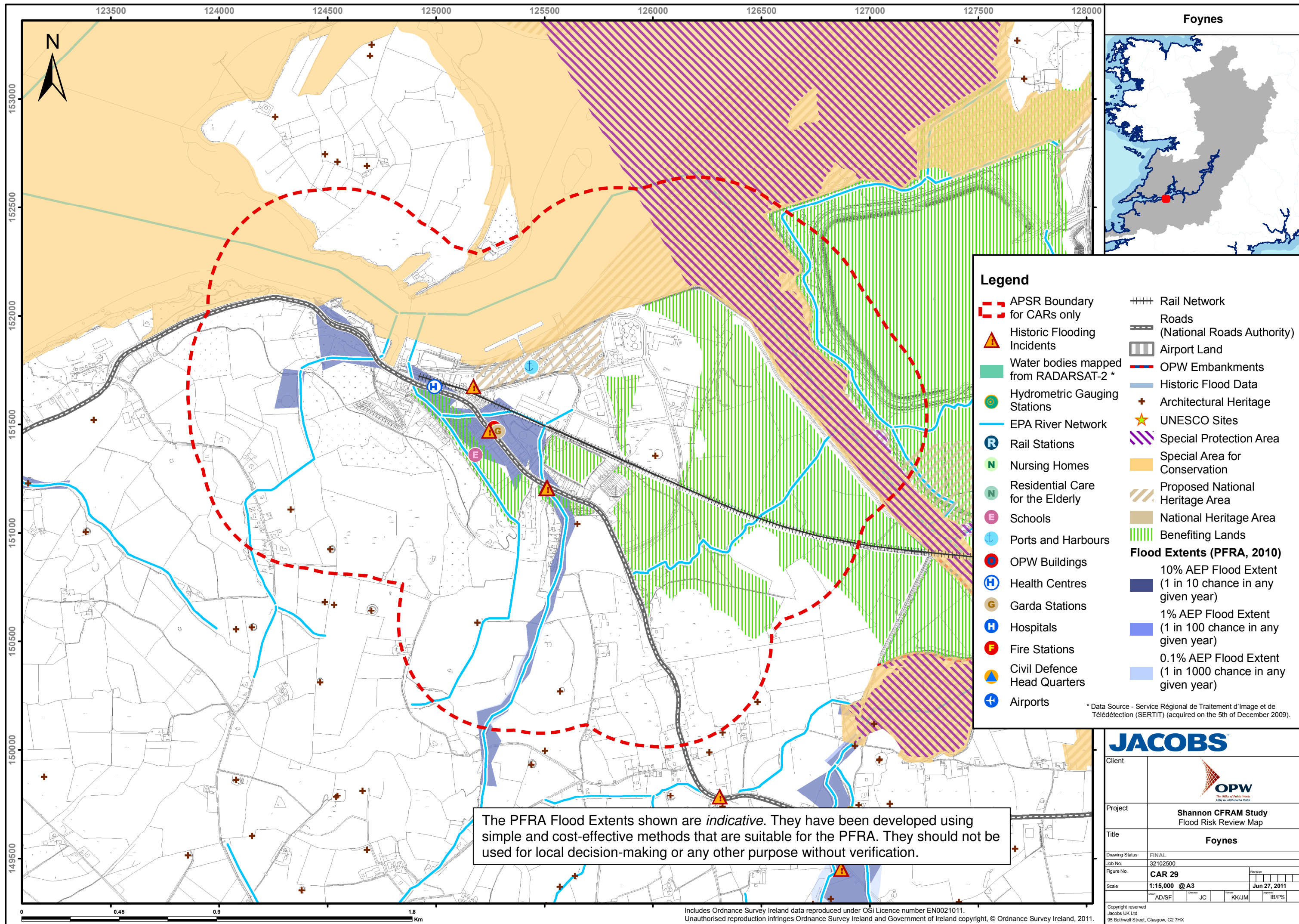
Photo 2: Foynes Dock quay - wall was removed (circa 1970) so limited protection against high tides




Photo 3: Storage area where the flood water is pumped from through the tidal embankment



Photo 4: Extensive flat area behind the tidal embankment



JACOBS

Client			
Project	Shannon CFRAM Study Flood Risk Review Map		
Title	Foynes		
Drawing Status	FINAL		
Job No.	32102500		
Figure No.	CAR 29		
Scale	1:15,000 @ A3		
Drawn	AD/SF	Checked	JC
Drawn	KK/JM	Checked	IB/PS
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