

## **WESTMEATH LOCAL AUTHORITIES**



## **FLOOD EMERGENCY RESPONSE PLAN**

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## Introduction

In September 2004 the Government confirmed the Office of Public Works as the State's lead agency in flooding, to be tasked with delivering an integrated multifaceted programme aimed at mitigating future flood risk and impact. To find more information on the OPW's flood risk management you can visit the OPW website at <http://www.flooding.ie>

Floods are a natural and inevitable part of life in Ireland. They are usually caused by a combination of events including overflowing river banks, coastal storms or blocked or overloaded drainage ditches. Numerous severe floods have occurred throughout the country in the last decade. Since the impacts of flooding are so devastating it is important that people whose properties are at risk take appropriate action to resist flooding.

It is widely anticipated that changes in rainfall patterns and rises in sea levels resulting from climate change may make such flooding incidents more frequent and severe in the future. While we cannot prevent the climatic causes of flooding, we can take measures to prepare for it and reduce the resulting damage and hardship. As well as the risk to life and the damage caused to property, flooding has many other, less tangible, impacts on people's lives. These include the loss of sentimental belongings, the nuisance of cleaning up after the flood, the inconvenience of having to live in temporary accommodation while this clean up takes place and the constant worry of future flooding.

## Flooding Facts

- Just 150 mm (6 inches) of fast flowing water can knock you off your feet.
- Scientists predict that climate changes may lead to more frequent flooding in the future.
- Floods are the most common and widespread of all natural disasters.
- One-third of flooded roads and bridges are so damaged by water that any vehicle trying to cross stands only a 50% chance of making it to the other side.
- Flood waters move fast enough to roll boulders, tear out trees, and destroy bridges, a process known as scouring.
- Flood water is often contaminated by overflowing drains, animal carcasses and refuse.
- Electric currents can pass through flood waters from downed power lines and cables.
- Flood water can move manhole and drain covers, creating invisible dangers.

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## **Who is Responsible for Protection of Property from Flooding?**

The property owner, whether the property be a house, business, farm or any other type of property, is responsible for protecting their own property from flooding. This protection could take the form of flood defence systems including flood barriers, insurance, and plans as to what to do in the event of flooding. See **Appendix B** at the end of this document which will assist you in regard to this.

In addition, assistance will usually be available from the local authority depending on the demand on its resources. (See below).

### **Local Authority Response to Flood Events**

Section 5.4.2 of the Department of the Environment, Heritage, and Local Government (DoEHLG) document "A Framework for Major Emergency Management" (Sept. 2006) and Sections 4.6.9 & 2.7.7 of the Report of the Flood Policy Review Group (2004) designates the Local Authority as the lead agency in the response to flood events. This should not be mis-interpreted that the local authority is responsible for protection of property from flooding. This is the responsibility of the property owner. However, the local authority will assist in a number of ways and will co-ordinate the local response.

#### **Maintenance of Essential Services**

Irrespective of any emergency including flooding, one of the primary roles of the Local Authority is the maintenance of essential services. The essential services include;-  
provision of water supply,  
continuance of running of sewage treatment plants,  
keeping roads open on a priority basis,  
operating the Fire Service.

#### **Emergency Housing/Accommodation**

If people are required to evacuate from their homes, the Local Authority will assist those who are unable to find accommodation with their relations, neighbours or friends by providing temporary accommodation until such time as the people involved can return to their homes or find alternative accommodation. (See Appendix 18 of the Major Emergency Plan).

#### **Westmeath Co. Co. Civil Defence**

In the event of flooding, Westmeath Co. Co. Civil Defence may be mobilised by the Flood Operations Committee. Civil Defence can provide trained personnel to assist the Local Authority to help the public in times of flooding. Help includes:-

- providing rescue from early or low floods;
- carrying out flood patrols;
- Civil/Military Liaison;
- traffic management;
- sandbagging;
- checking and monitoring flood levels;
- flood surveys;
- transporting persons affected by the floods;

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- providing a volunteer flood relief centre;
  - assisting with evacuations;
  - liaising with home/business owners;
  - providing advice;
  - distributing information packs;
  - medical checks;
  - arranging medical appointments;
  - distributing disinfectant kits;
  - food and fuel drops;
  - arranging domestic refuse collections;
  - assisting with high axle shuttle vehicle service.

### **Provision of Information to the Public**

Westmeath County Council will provide information to the public primarily by means of the Westmeath County Council website: <http://www.westmeathcoco.ie> and on Twitter.

In addition, information will be conveyed by use of the local newspapers and local radio.

In certain circumstances, Westmeath County Council may provide information using leaflet drops to specifically targeted homes.

Information on flooding on the River Shannon is also available under the OPW for the Catchment Flood Risk Assessment & Management Study (CFRAMS), - see link below relating to the River Shannon:- <http://shannoncfamstudy.ie/>

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## **Appendix A**

### **Flood Response for County Westmeath (incl. Athlone Town and surrounding areas)**

This Appendix outlines how the Local Authority of Westmeath County Council responds to a flooding incident in County Westmeath including Athlone town and surrounding areas.

There are five sections:-

- A1 Management of Flood Response
- A2 Flood Management Procedure for Athlone Town and surrounding areas
- A3 Flood Management Procedure for Mullingar Town and surrounding areas
- A4 Flood Management Procedure for Kilbeggan & Coole areas
- A5 Major Emergency Stores

#### **A1.0 Management of Flood Response**

##### **A1.1 Organisations Involved**

Westmeath County Council is the lead flood response agency for any flood emergency in County Westmeath including Athlone town and surrounding areas. Assistance may be provided by other response organisations including:-

Westmeath County Council's Civil Defence (See Appendix 13 of Major Emergency Plan);  
An Garda Síochána (See Appendix 9 of Major Emergency Plan);  
Health Services Executive and the Ambulance Service (See Appendix 9 of Major Emergency Plan);  
Defence Forces (See Appendix 12 of Major Emergency Plan);  
Irish Coast Guard (See Appendix 9 of Major Emergency Plan);  
Athlone Sub Aqua Club (See Appendix 14 of Major Emergency Plan);  
The Samaritans (See Appendix 14 of Major Emergency Plan);  
St Vincent de Paul (See Appendix 14 of Major Emergency Plan);  
Order of Malta (See Appendix 14 of Major Emergency Plan);  
Irish Red Cross (See Appendix 14 of Major Emergency Plan);  
Irish Mountain Rescue Association (See Appendix 14 of Major Emergency Plan).

Each organisation, and people within each organisation charged with specific roles under the Major Emergency Plan, will provide assistance and operate in accordance with their roles and responsibility and according to agreed procedures as detailed in the Appendices of the Major Emergency Plan.

Each organisation should review its preparation (including training if necessary), equipment and provisions for a flooding incident and ensure that these are adequate.

It should be noted that all of the above response organisations can be contacted directly for assistance with the exception of the Defence Forces. The Defence Forces should be contacted through An Garda Síochána or through the Dept of Defence (as detailed in Appendix 12 of the Major Emergency Plan).

It should also be noted that Local Authorities have no statutory responsibility to protect privately owned properties from flood risk.

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## **A1.2 Flood Operations Committee**

The Flood Operations Committee members are:-

- (i) Director of Services for the relevant Area – Chairperson;
- (ii) Senior Executive Engineer for the relevant Area;
- (iii) Media Liaison Officer, Westmeath Co. Co. or Town Clerk for Athlone (who will also liaise with Media);
- (iv) Housing Officer, Westmeath Co. Co. or Athlone Town Council as appropriate;
- (v) Water Services Senior Engineer, Westmeath Co. Co.;
- (vi) One designated member from each of the other response organisations as required.

Each individual agency is responsible for the training of its own staff. However, the Flood Operations Committee may arrange a flood response exercise if deemed necessary.

All contact details are contained in the relevant Appendices in the Major Emergency Plan.

## **A1.3 Action in the Event of a Flood**

When the chair of the Flood Operations Committee deems it necessary, he will call a meeting of the Committee.

The Flood Operations Committee will then decide on the following:-

- (i) what actions are required and within what timeframe;
- (ii) what resources are required and how they will be provided;
- (iii) what warning or information is needed by the public;
- (iv) what assistance is needed and how it will be obtained;
- (v) if evacuation is necessary and how it will be carried out;
- (vi) how the emergency response and recovery will be controlled;
- (vii) how the emergency response will be monitored and recorded;
- (viii) when and where a further meeting of the committee will take place;
- (ix) when and where a review of the emergency will take place.

## **A1.4 Investigation after a Flood**

As soon as is possible after a severe flooding incident, an investigation will be carried out by the Flood Operations Committee in the Area where the incident occurred in conjunction with all the agencies and parties involved to:-

- (i) examine the cause of the flooding;
- (ii) discuss the response;
- (iii) ascertain what improvements could be made for future incidents;
- (iv) review and update the flood plans if appropriate.

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## **A2.0 Flood Management Procedure for Athlone Town and surrounding areas**

### **A2.1 Summary**

Sections A2.2, A2.3 and A2.4 lay down flood management procedures for Central Terrace, Iona Villas and the Accommodation Road areas which have been developed since the November 2009 flooding event. Physical measures have been engineered and put in place in each of these locations to enable the Council to mitigate the consequences of flood threat at these locations.

Flooding also occurs at The Strand Area, The Quays area, Brick Island, Parnell Square and the Deerpark Road area and the Golden Island and Carrick-O-Brien areas south of the town. These areas are addressed in Section A2.5.

### **A2.2 Iona Park/Villas**

#### **A2.2.1 Overview**

This procedure has been prepared to deal with infrequent flooding events at Iona Villas and Iona Park (see Fig A2.2.1) which arise due to the flood levels in the River Shannon. During such events, rising water from the Shannon floods the access roads in Iona Park and Iona Villas and as flood water levels increase, some houses can become flooded.

Part of the surface water drainage system from this area is connected directly via an outfall pipe to the adjacent canal. This canal joins the Shannon some 500 metres north of the area and the water level in the Shannon is replicated in the canal. In the past when Shannon levels have increased, water has flowed back through this pipe and through the connected road gullies to surface on the access roads. In addition, 2 no. overflow chambers on the foul sewer pipeline network in the area are connected directly by pipes to overflow into the canal during surcharge events on the sewer network and these pipelines cause similar problems to that outlined above at times of high flood levels. Following detailed inspections and level surveys, it is considered that the sewer overflow at Iona Villas is suitably protected by means of a high level weir system to protect the area from canal back flows. However the sewer overflow near the road junction with the Old Galway Road is vulnerable.

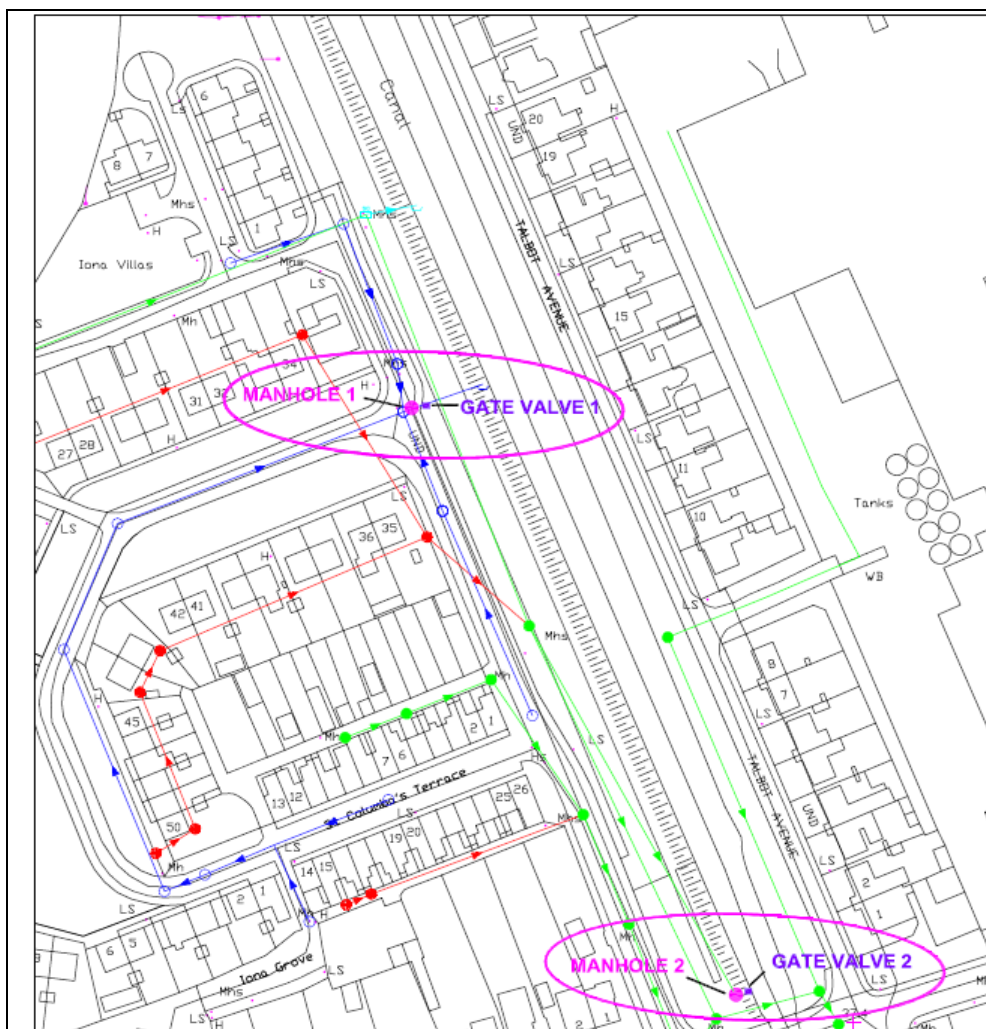
The protection system detailed in this procedure is based on a monitoring routine of the water levels in the Shannon at Athlone Lock. A flood warning level has been chosen to give the Council a number of days (approx. 10 days) warning before the Flood Management plan is activated. Once the flood level has reached the pre-determined warning level, daily monitoring will take place and if the flood level rises to a second pre-determined level (the intervention level), the council staff or the emergency call-out team (depending on the time of day) will be deployed and a series of gate valves on the sewer network in the Iona Villas / Iona Park area will be closed. Once these valves are closed, water pumps and tanker systems will be deployed to over-pump and remove surface water emanating locally from the area. These disposal systems will remain in place until water levels have dropped sufficiently and are on a downward trend thereby allowing the re-opening of the gate valves and standing down the flood management procedure.

The responsibility for the implementation and management of this procedure is assigned to the Engineering Department of Athlone Area, Westmeath County Council during normal working hours and to the emergency on-call supervisor (Athlone Area) in consultation with the duty engineer during out-of-hours working.

### A2.1.2 Procedure

Once water levels reach the Warning level which is a value of 38.490 on the Thatch Gauge (or 38.265 on the upstream gauge in Athlone Lock) both Poolbeg datum, daily monitoring and recording of these levels will be carried out by a Council engineer and these records will be kept on the record sheet. (See Fig A2.2.4). The Council will be aware that water levels have reached this warning level from cursory examination of river levels in Athlone during normal work routines. If water levels reach the intervention level which is a value of 38.990 on the Thatch Gauge (or 38.765 on the upstream gauge in Athlone Lock), the engineer will liaise with the supervisor and the emergency unit will be mobilised. On arrival on site, the supervisor will instruct the following actions (in the following sequence):

1. One staff member will be deployed to collect a generator, valve keys and temporary lights from the Council's Waterworks site and to bring them to site.
2. Two staff members will be deployed to the Council's machinery yard (Athlone) to collect the trailer mounted water pump and the necessary traffic management equipment as detailed in the traffic management layout. (See Fig A2.2.5). This traffic management system will be installed in accordance with the layout and the water pump suction pipe placed into Manhole 1 (see Fig A2.2.2) with the delivery pipe from the pump passed across the access road above and into the canal adjacent.
3. Gate Valve '1' (see Fig A2.2.2) will be closed first followed immediately by Gate Valve '2' (see Fig A2.2.3). The pump at Manhole 1 will then be started.
4. The procedure will be monitored until levels have dropped sufficiently and are on a downward trend so as to allow stand down of the flood procedure. This decision will be taken following consultation between the supervisor and the duty engineer.

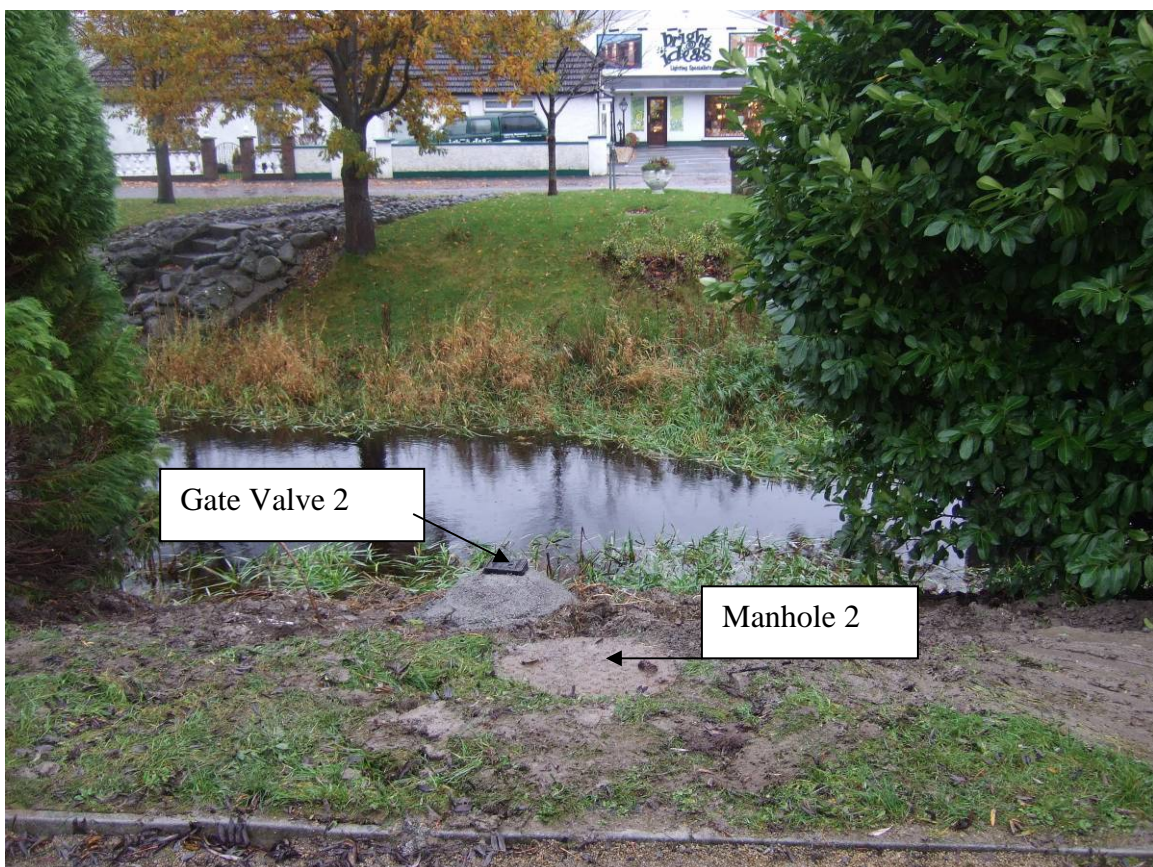


**Fig A2.2.1: Location Map of Iona Villas**





**Fig A2.2.2: Gate Valve 1 & Manhole 1 at St. Columba's Tce/Iona Park**



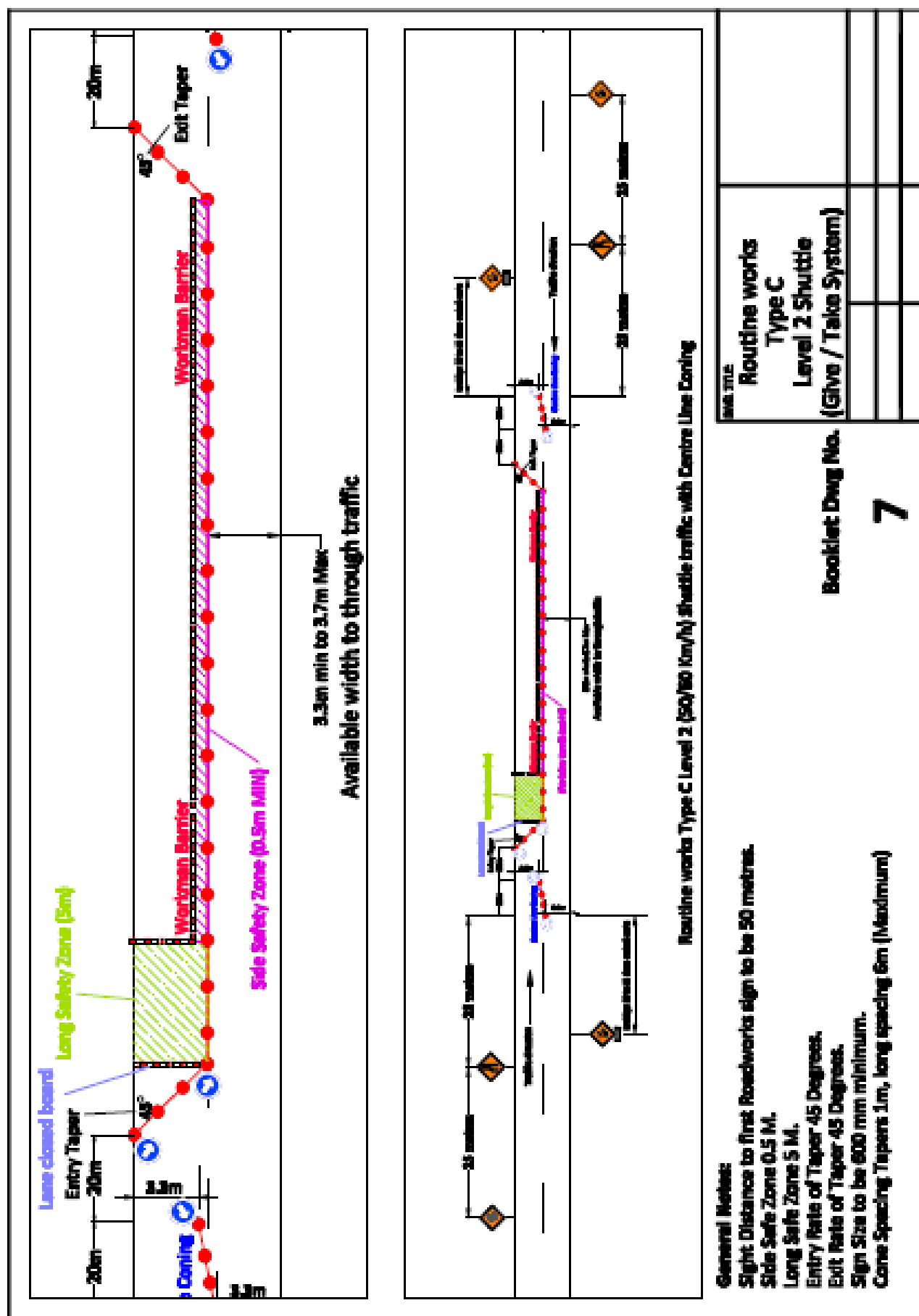
**Fig A2.2.3: Gate Valve 2 & Manhole 2 at St. Columba's Tce/Iona Park**

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**Fig A2.2.4: Monitoring Record of Shannon Flood Levels**

**Period:** ..... to .....

<b>Date</b>	<b>Time</b>	<b>Thatch Gauge Reading</b>	<b>Upstream Gauge Reading Athlone Lock</b>



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## **A2.3 Central Terrace**

### **A2.3.1 Overview**

This procedure has been prepared to deal with intermittent flooding events which arise due to the surcharging of the sewerage network in the vicinity of Central Terrace (see Fig A2.3.1) mainly due to heavy rainfall and the inability of the Abbey Road Sewage Pumping Station to cater for the increased inflows during such events.

The system is designed to alert Council staff via a text warning system from the Abbey Road Pumping Station when sewage levels at the pumping station exceed the normal working levels. This might arise due to unusually high sewage inflows or due to mechanical failures within the pumping station infrastructure.

An ultrasonic level sensor within the pumping station continually monitors the level of sewage and the text warning system has been arranged to notify the council at two warning levels. The first warning level indicates that sewage levels are unusually high and are rising and based on historical level information, this level allows warning of approximately 3 hours before flooding of the Central Terrace houses would occur. The second warning level indicates that sewage levels have risen further and that there is approximately 1½ hours available before a possible flooding event. On receipt of the second warning, the emergency call-out team will be deployed and a series of gate valves on the sewerage network around the Central Terrace houses will be closed to prevent sewage flowing back into the houses. The methodology for closing these valves is outlined in the following sheets. Once these valves are closed, pumps and tanker systems will be used to dispose of local rainwater and sewage emanating from the Central Terrace / The Villas houses. These disposal systems will remain in place until levels have dropped sufficiently and are on a downward trend thereby allowing the re-opening of the gate valves and to stand down the flood procedure.

The responsibility for the implementation and management of this procedure is assigned to the Engineering Department of Athlone Area, Westmeath County Council during normal working hours and to the emergency on-call supervisor (Athlone Area) in consultation with the duty engineer during out-of-hours working.

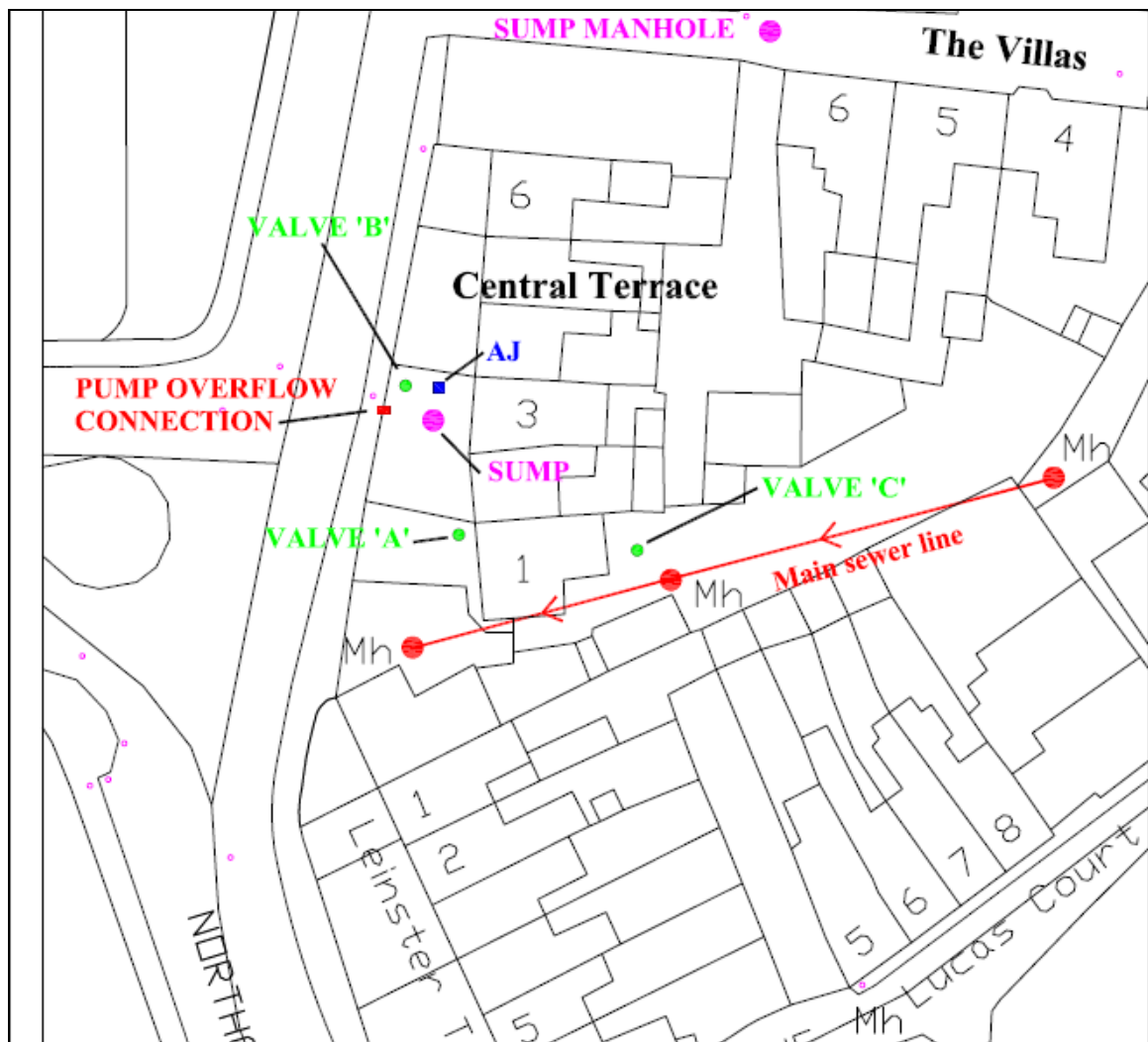
### **A2.3.2 Procedure**

On receipt of the second warning text level message, the supervisor (having already been aware of rising levels at the pumping station by reason of the first text message) will mobilise the on-call emergency unit. On arrival on site, the supervisor will instruct the following actions (in correct sequence):

1. One staff member will be deployed to collect the vacuum tanker from the Council's machinery yard (Athlone) and the two remaining staff members will collect the mobile pumps, generator, valve keys and temporary lights from the Abbey Road Pumping Station and bring them to site.
2. Two staff members will be deployed to the Council's machinery yard (Athlone) to collect the trailer mounted water pump and the necessary traffic management equipment as detailed in the traffic management layout. (See Fig A2.2.5). This traffic management system will be installed in accordance with the layout and the water pump placed at Manhole 1 with the delivery pipe from the pump inserted through the wall opening adjacent. (See Figs A2.3.2, A2.3.3 & A2.3.4).



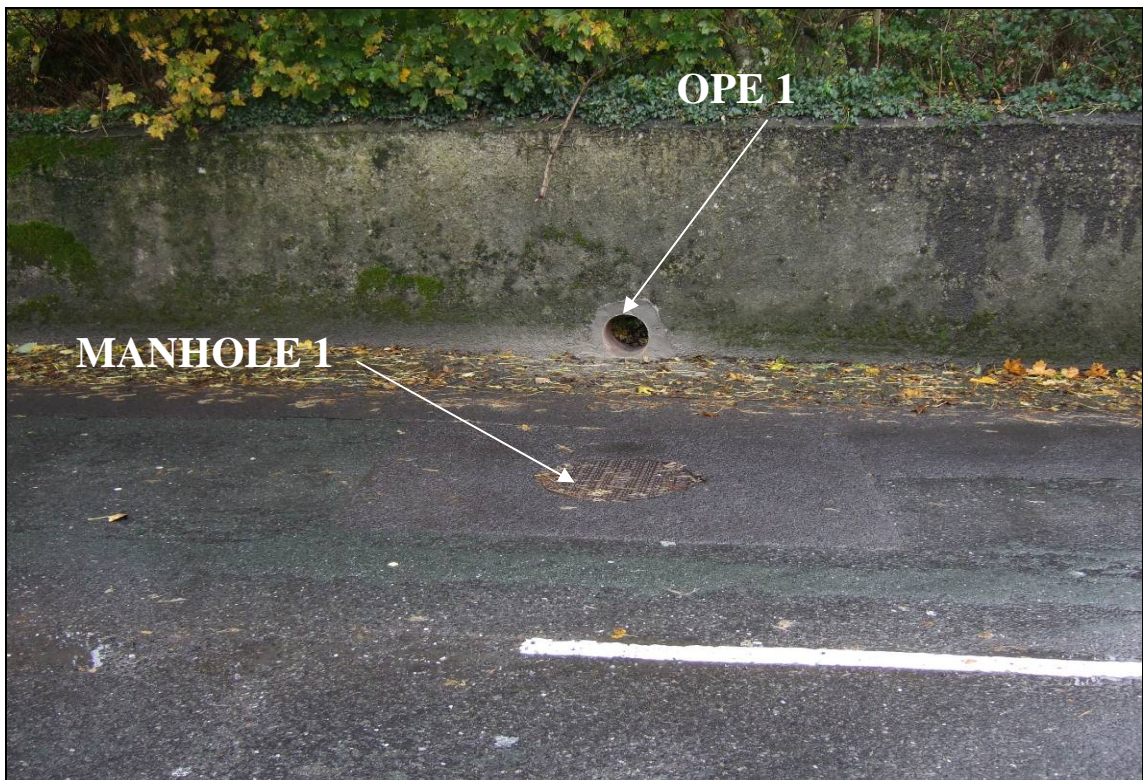
3. Valve 'A' (see Figs A2.3.1 & A2.3.5) will be closed first followed immediately by valve 'B' (see Figs A2.3.1 & A2.3.6). The pump will be inserted into the sump at the front of No. 3 Central Terrace and the deliver pipe attached to the 'pump overflow connection' at the front boundary wall. (See Fig A2.3.6). The pump overflow connection cap will be removed and the pump started. (See Fig A2.3.7).
4. Having verified that the vacuum tanker has arrived at the location the supervisor will arrange for valve 'C' (see Figs A2.3.1 & A2.3.8) to be closed and sewage levels within the isolated sewerage network at the rear of Central Terrace and The Villas (see Fig A2.3.9) will thereafter be monitored and drawn down intermittently to prevent surcharging of this network. Tankers when full will be removed and emptied into the overflow chamber of the Abbey Road pumping station.
5. The event will be monitored until levels have dropped sufficiently and are on a downward trend so as to allow stand down of the flood procedure. This decision will be taken following consultation between the supervisor and the duty engineer



**Fig A2.3.1: Location Map for Central Terrace Athlone**

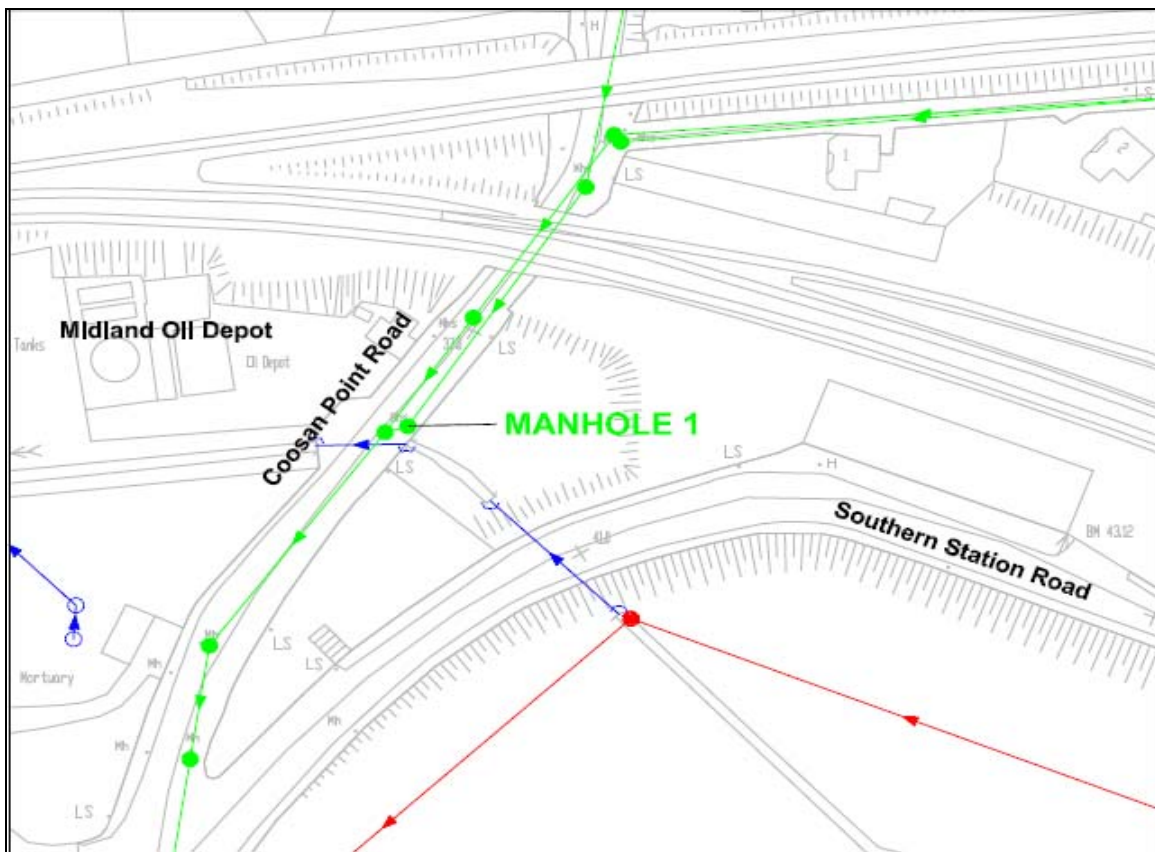


**Fig A2.3.2: Manhole 1 on Coosan Point Road**



**Fig A2.3.3: Manhole 1 on Coosan Point Road**



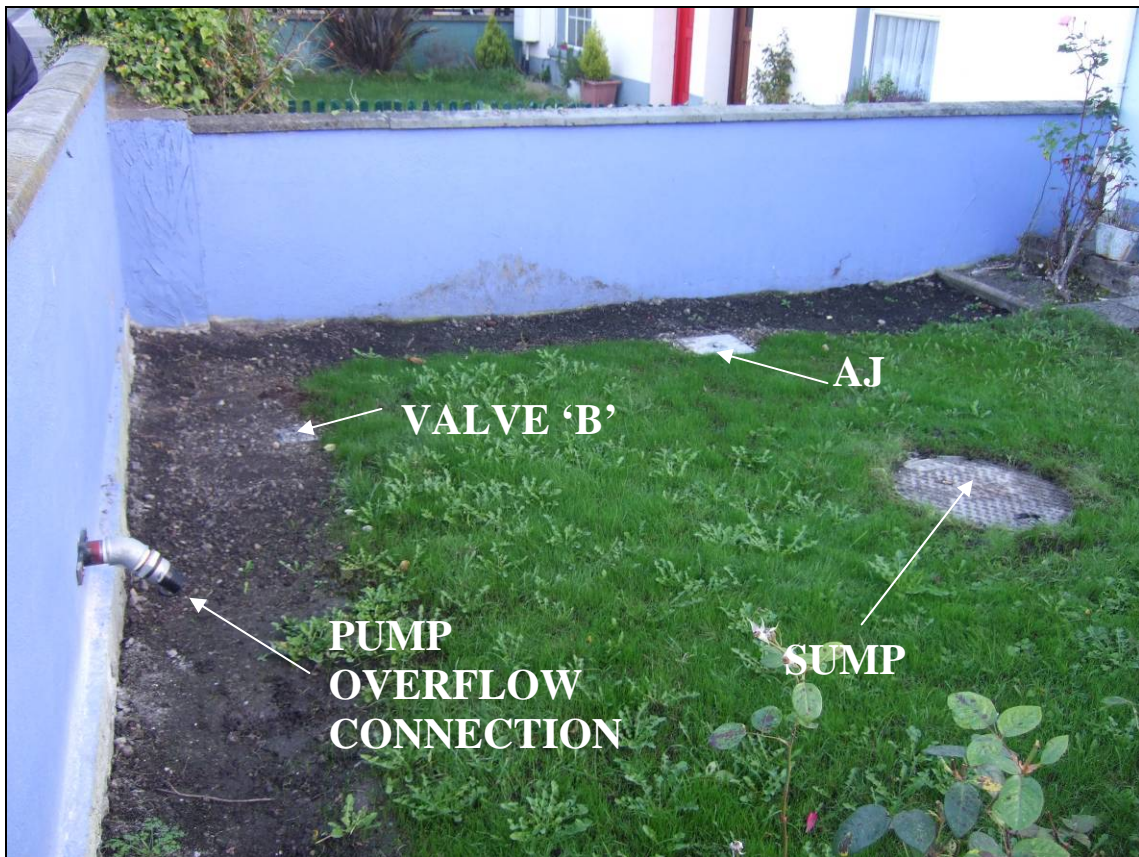


**Fig A2.3.4: Location of Manhole 1 on Coosan Point Road**

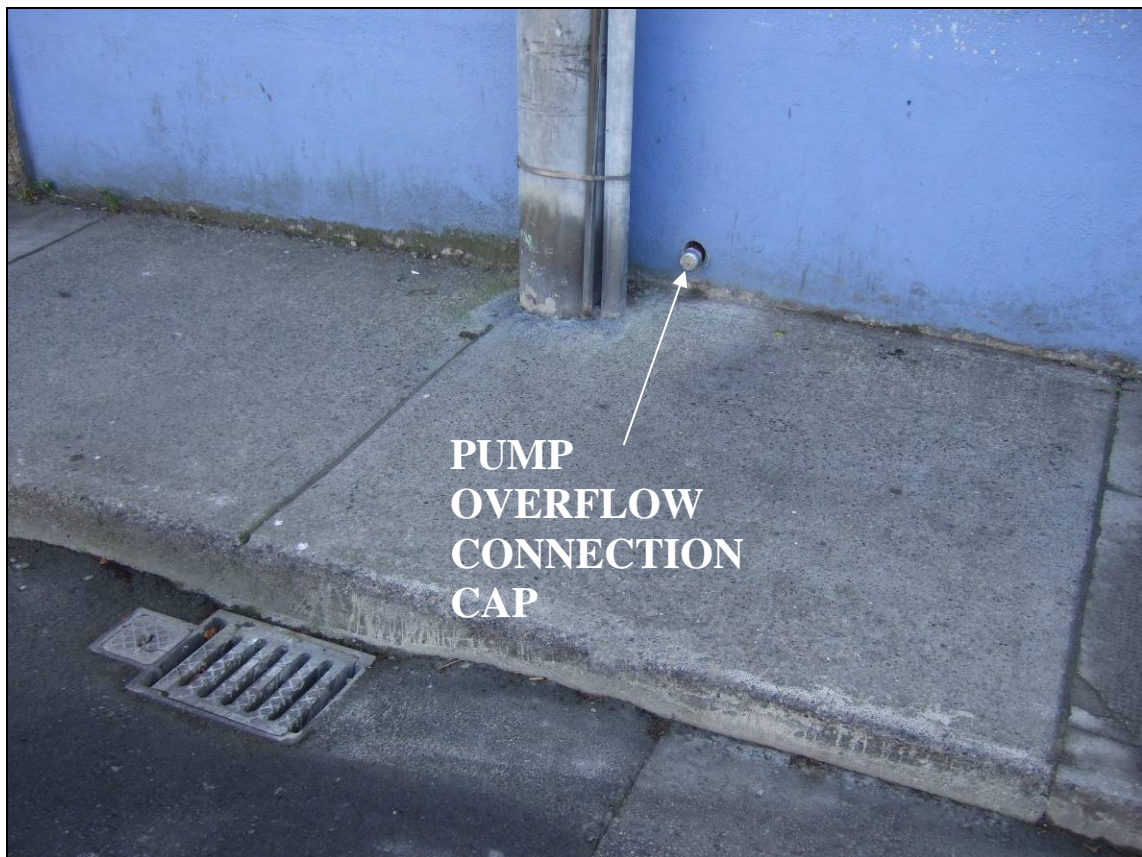


**Fig A2.3.5: Valve 'A' at No. 1 Central Terrace, Athlone**





**Fig A2.3.6: Front Garden No. 3 Central Terrace, Athlone**

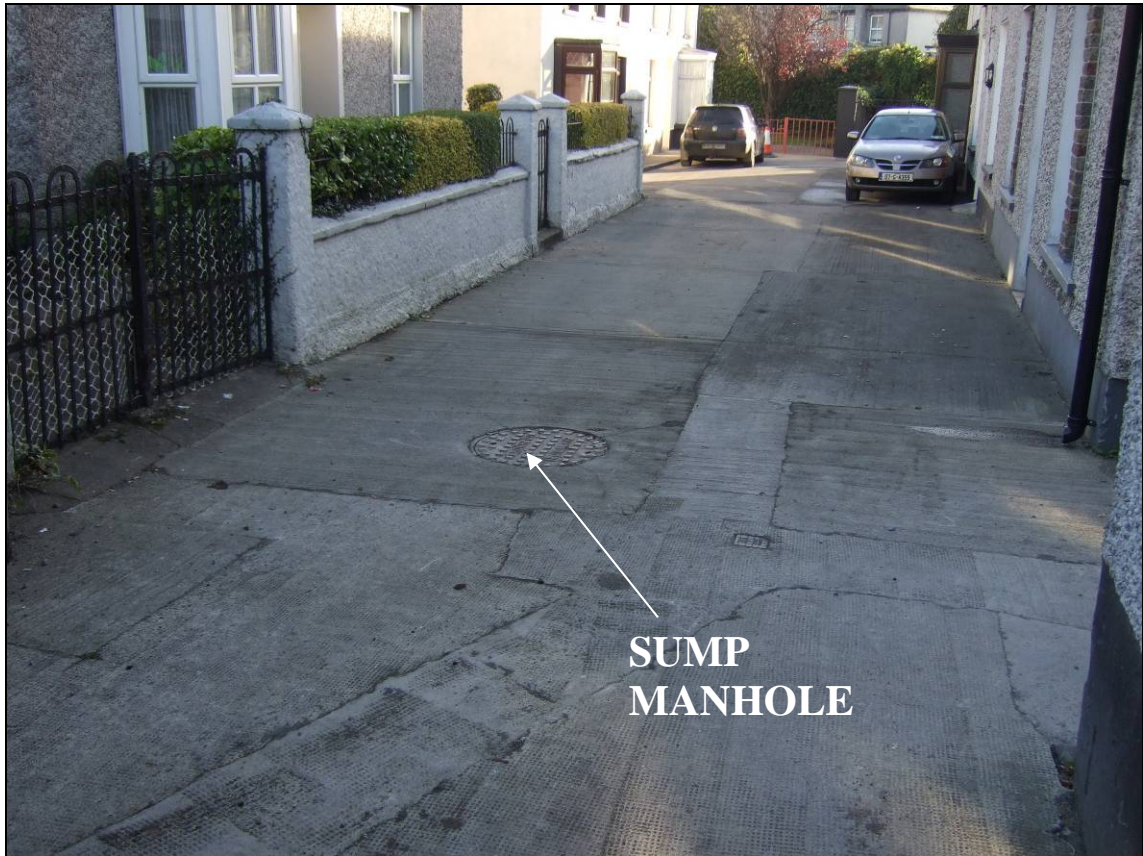


**Fig A2.3.7: Exterior face of front boundary wall at No. 3 Central Terrace**





**Fig A2.3.8: Valve 'C' at the rear of No. 1 Central Terrace**



**Fig A2.3.9: Sump manhole at The Villas**



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## **A2.4 Accommodation Road**

### **A2.4.1 Overview**

This procedure has been prepared to deal with infrequent flooding events on the Accommodation Road which arise due to the flood levels in the River Shannon. During such events, rising water from the Shannon floods onto the Accommodation Road at its lowest point near ‘The White Bridge’ and as flood water levels increase this road can become sufficiently flooded to render it impassable thus forcing the Council and An Garda Síochána to put traffic diversions in place.

Part of the surface water drainage system from this area is connected directly via an outfall pipe to the adjacent River Shannon. In the past when Shannon levels have increased, water has flown back through this pipe and through the connected road gullies to surface on the Accommodation Road.

The protection system detailed in this procedure is based on a monitoring routine of the water levels in the Shannon at Athlone Lock. A flood warning level has been chosen to give the Council a number of days warning (10 days approx) before the Flood Management plan is activated. Once the flood level has reached the pre-determined warning level, daily monitoring will take place and if the flood level rises to a second pre-determined level (the intervention level), the council staff will be deployed and a flood defence barrier will then be installed along a pre-determined line on the river side of the road. The gate valve on the connecting pipeline from the Accommodation Road road gullies will be closed and water pumps and tanker systems will be deployed to over-pump and remove surface water emanating locally from the area. These flood defence systems will remain in place until water levels have dropped sufficiently and are on a downward trend thereby allowing the re-opening of the gate valves and standing down the flood management procedure.

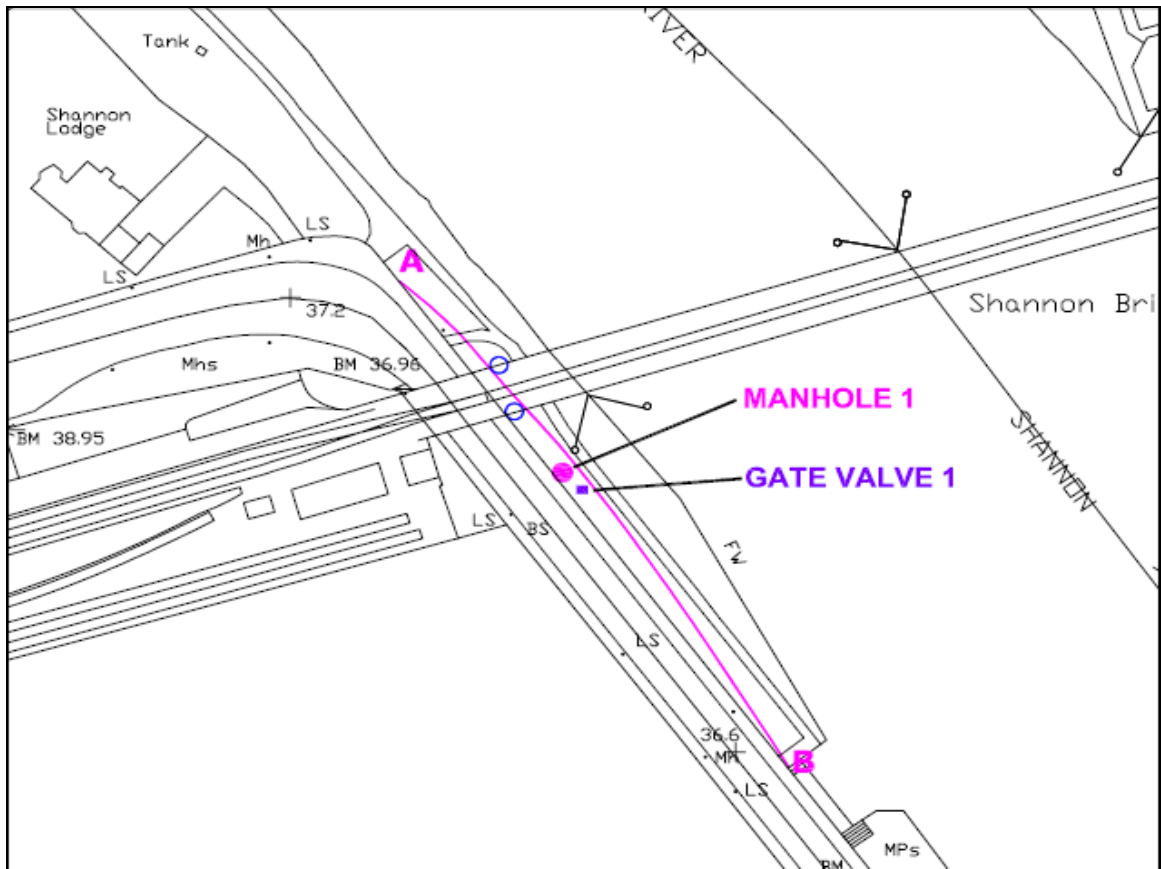
The responsibility for the implementation and management of this procedure is assigned to the Engineering Department of Athlone Area, Westmeath County Council during normal working hours and to the emergency on-call supervisor (Athlone Area) in consultation with the duty engineer during out-of-hours working.

### **A2.4.2 Procedure**

Once water levels reach the Warning level which is a value of 38.360 on the Thatch Gauge (or 38.135 on the upstream gauge in Athlone Lock) both Poolbeg Datum, daily monitoring and recording of these levels will be carried out by a Council engineer and these records will be kept on the record sheet. (See Fig A2.2.4). The Council will be aware that water levels have reached this warning level from cursory examination of river levels in Athlone during normal work routines. If water levels reach the intervention level which is a value of 38.660 on the Thatch Gauge (or 38.435 on the upstream gauge in Athlone Lock) the engineer will liaise with the supervisor and the emergency unit will be mobilised. On arrival on site, the supervisor will instruct the following actions (in the following sequence):

1. The modular flood defence barrier will be installed along the line and for the extent indicated between points A and B (see Fig A2.4.1).
2. Two staff members will be deployed to the Council’s machinery yard (Athlone) to collect the trailer mounted water pump and once on site the water pump suction pipe placed into Manhole 1 (see Figs A2.4.1 & A2.4.2) with the delivery pipe from the pump passed across the flood barrier and into the river adjacent.
3. Gate Valve ‘1’ will then be closed and the pump at Manhole 1 will then be started. (See Fig A2.4.2)

4. The system will be monitored until levels have dropped sufficiently and are on a downward trend so as to allow stand down of the flood procedure. This decision will be taken following consultation between the supervisor and the duty engineer.



**Fig A2.4.1: Accommodation Road Flood Management Location Map.**



**Fig A2.4.2: Manhole 1 & Gate Valve 1 at Accommodation Road**

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## **A2.5 Assessment of other Problem Areas within Athlone**

### **A2.5.1 The Strand (East side of River)**

The factors which gave rise to flooding in this area in November 2009 were as follows:

1. The surcharging of the trunk foul sewer which runs along the Strand to the Golden Island pumping station by flood water. This pipeline is susceptible to flood water ingress and it collects surface water gullies and downpipes along with foul sewage public and private pipelines in this area. Critically, it also channels all foul sewage from the Abbey Road pumping station (and hence the Coosan East and West pumping stations coupled with the catchment to the north of Church St.) to the Golden Island pumping station. Once flood water reaches critical levels the pumps within the Golden Island pumping station are not capable of dealing with the huge inflows and flooding occurs. Under such circumstances the combination of flood water, storm water and foul sewage flows back through the connected road gullies and manholes (popping the lids in some cases) and any domestic Armstrong Junctions and gullies. The solution to this problem lies within the Athlone Main Drainage scheme currently being designed.
2. The river quay wall at this location is constructed from cut stone dating back over a hundred years. The condition of the joints between the stones would indicate that the wall is wholly pervious thus providing negligible resistance to flood waters once levels rise. There may be some degree of impermeability within the soil backfill behind the quay wall but this is unknown. Additionally, there is a substantial surface water stone culvert along this area, the full location and extent of which is unknown. The existence of this structure would add to the risk of flood waters impacting adversely on the Strand area.
3. The storm water outfall pipeline from the Town Centre Retail & Residential development which runs under Griffith St. collects all surface water gullies along this street and outfalls into the Shannon. The headwall where this pipeline joins the Shannon is not regulated in any way to prevent high water levels in the Shannon flowing back through the pipe and back through road gullies, particularly at the low area some 15 metres back along Griffith St. In addition, there are numerous surface water gullies along the Strand and Wolfe Tone Tce. area which are connected directly into the Shannon and which would act in a reverse manner to allow flood water to flow back from the Shannon into the Strand area during flood events.
4. During the November 2009 floods the level of the river Shannon rose above the top of the quay wall along the Strand along sections from Flynn's funeral home north to the site of the old Town Bridge, opposite the junction of The Strand with Friary Lane and from Griffith St. along Wolfe Tone Tce. to Burgess Park. At the peak flood, water levels in these areas varied to a maximum of 300mm. Proprietary demountable temporary flood defence systems have been acquired and can be deployed in this area at times of flood risk which, coupled with water pumps to over-pump water which would seep through such a barrier system, would in all likelihood address the issue of flood water breaching the top of the quay wall.

The submission to the Office of Public Works in February 2010 for funding for this area under the Non-Costal Minor Flood Mitigation Works scheme envisaged the provision of a permanent barrier system along the quay wall at this location coupled with some separation of the surface water system within the public road along the Strand from the foul sewage system with subsequent over-pumping in times of flooding. The provision of a permanent barrier has been deemed unacceptable from an aesthetic viewpoint and the complexity of the foul and surface water pipeline networks in the area deem that detailed surveying and design works must be undertaken to assess the feasibility of segregating and dealing separately with surface water. Indeed such a proposal might prove pointless in the short term until the concerns outlined in 1, 2 and 3 above are resolved.

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### **A2.5.2 The Quays (West side of River)**

The factors leading to flooding in this area in November 2009 were as follows:

1. The surcharging of the trunk foul sewer which runs along the Promenade (north of the Town Bridge) to the West Bank pumping station by flood water. This pipeline is susceptible to flood water ingress and it collects surface water gullies and downpipes along with foul sewage public and private pipelines in this area. Similarly to the Strand area, this pipeline collects a large catchment of surface water and sewage and when flood water reaches critical levels the pumps in the pumping station become overwhelmed and flooding occurs. Under such circumstances the combination of flood water, storm water and foul sewage flows back through the connected road gullies and manholes and any domestic Armstrong Junctions and gullies. The solution to this problem lies within the Athlone Main Drainage scheme currently being designed.
2. Similar to the Strand area, the permeability of the quay wall and the soil behind is very questionable and it is possible that this combination would provide negligible defence to the ingress of high water levels in the river Shannon.
3. Breaching the top of the quay wall along the Quay along sections from the Lock Keepers house north to the public car park on the Shannon side of the Castle. At the peak flood, water levels in this area varied to a maximum of 350mm.above existing road levels.

Proprietary demountable temporary flood defence systems have been acquired and can be deployed in this area at times of flood risk which, coupled with water pumps to over-pump water which would seep through such a barrier system, would in most likelihood address the issue of flood water breaching the top of the quay wall, however such a proposal would not address the flooding of the area in the short term until the concerns outlined in 1 and 2 above are resolved.

### **A2.5.3 Brick Island, Parnell Square, Deerpark Road area, Millbank, Canal Walk and the Golden Island and Carrick-O-Brien areas south of the town.**

These areas have been eliminated from any short term flood relief measures on the basis that the cost for such measures would prove excessive when assessed under the benefit/cost and overall cost criteria of the Non-Costal Minor Flood Mitigation Works scheme. Minor ‘cellular’ flood protection measures in these areas would not provide any defence to flood risk. We have examined the Deerpark Road/The Park/Parnell Sq. area in some detail and we have found that the physical obstacles associated with the installation of a temporary flood defence barrier coupled with the backflow of flood water and sewage through underground pipelines would render such efforts useless in the event of high flooding. The solution to flooding in these areas must await the outcome of the CFRAM study on the Shannon catchment being undertaken by the Office of Public Works.

In the event of light flooding in these areas, sand bagging will be made available. However, in the event of a prolonged flooding incident, it is likely that evacuation of affected dwellings will be the most effective solution.

The attention of residents of these areas in particular, is drawn to Appendix B which lists actions and precautions which can be carried out in advance of flooding. For the relatively small cost involved per household, consideration should be given by the residents to provide themselves with some of the proprietary barriers available. Even if these precautions do not fully prevent flooding, it seems very likely that they will greatly reduce the consequences of flooding and may allow the flooding to be managed successfully.

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## **A3.0 Flood Management Procedure for Mullingar Town and surrounding areas**

### **A3.1 Summary**

The town of Mullingar may be affected by the water levels in both Lough Owel and Lough Ennell and in the River Brosna and the Royal Canal. Therefore a flood risk analysis for the area has been carried out.

While flooding of lands may occur near the lakes, this flooding is not considered to require a specific response, given the associated land use.

The River Brosna rises to the north of Mullingar and flows south through the town into Lough Ennell, from where it continues until it joins the River Shannon at Shannon Harbour, Co. Offaly. The River Brosna, where it passes through Mullingar, is partly culverted along its route and at Springfield actually passes underneath the Royal Canal. Over the years the primary cause of flooding events in Mullingar has been a combination of heavy rainfall and simultaneous blockages of these culverts. However, even if flooding were to occur for this reason, it is considered that the Westmeath County Council (WCC) engineering staff for the Mullingar Area will be able to deal with any flooding which may occur. The equipment maintained in the Mullingar Area emergency store is deemed adequate in such an event. (See Section A5 below).

The Royal Canal was originally built for freight and passenger transport from Dublin to the River Shannon at Cloondara, Co. Longford. Construction of the canal began in 1790 and in 1806 the canal reached Mullingar. Construction lasted 27 years in total.

The summit of the canal passes through Mullingar and this 24 kilometre section extends from Lock 25 at Footy's Bridge near Riverstown, Killucan to Lock 26 at Coolnahay. The primary water supply to the canal is from Lough Owel via the Canal Supply line (See Fig A3.2.1).

Sections of the canal through Mullingar are constructed on raised embankments and in 1967, flooding of areas of the town occurred as a result of overtopping when the flow from Lough Owel along the Canal Supply was not controlled. The potential of a total or partial breach of these raised embankments exists as does the potential for over-topping as occurred in 1967. The areas where the canal is higher than surrounding ground are Springfield and Millmount to the East of the town, and the areas of Woodlands, Willowbrook and the Moorings to the West. The sections below outline procedures for managing flooding arising from a breach or overtopping of the Royal Canal.

### **A3.2 Royal Canal Breach**

#### **A3.2.1 Overview**

Details have been obtained from Waterways Ireland (WWI) relating to areas where the canal can be planked and also methods to be employed in relation to damming of the canal. Specification for damming of the Royal Canal has been obtained and these will be used as part of an action plan in the event of canal breach. Both planking and damming of the canal will be carried out by WWI.

WCC Water Services section believes that it can be reasonably assumed that the surface water system will not be able to cater for the dissipation of flood waters (approximately 275,000m<sup>3</sup>) in the event of a total failure of a section of the raised embankments. No areas have been marked as sacrificial flood plains within the town area but the River Brosna would be the most appropriate method of dissipating flood waters from the town and therefore any flood waters should be channelled to the River Brosna. A detailed modelling study is required to be carried out to analyse where flood waters would naturally gravitate to, identify sacrificial flood plains, determine strategies for channelling water to flood plains and the River Brosna, and assess existing surface water networks in the town and the capacities of these.

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The potential of a flooding emergency exists in Mullingar for a number of areas to be flooded if the banks of the Royal Canal are breached, whether by deliberate sabotage, by accidental damage, by mechanical means, risk of Lough Owel overtopping the barricades adjacent to the Sluice House on the Canal Supply, or by damage to WCC installations where such installations cross over or under the canal or are installed in the banks themselves. Currently there is potential for 275,000 m<sup>3</sup> of canal water to flood Mullingar. The nearest flood controls on the canal are the flood control gate at The Downs (5 kilometres west of Lock 25) (see Fig A3.2.2), the lock gates at Coolnahay Bridge (see Fig A3.2.3), and the sluice gates at the inlet from the Canal Supply from Lough Owel (see Fig A3.2.4 & Fig A3.2.5). It should be noted that there are two sets of sluice gates at Lough Owel, one of which is located inside the Sluice House.

### **A3.2.2 Crossing Points/ Possible Breach Locations on the Royal Canal**

There are 12 locations on the Royal Canal as it flows through Mullingar where there is a risk of the canal banks being breached/ compromised due to services crossing the canal or due to failure of embankments at various sections. See Fig A3.2.6 for locations. They are as follows:

- (i) 75mm water main in South embankment in Springfield.
- (ii) 225mm foul sewer passes under canal at Scanlan's Bridge (aka Harbour Bridge).
- (iii) 300mm combined sewer passes under canal at Railway Row.
- (iv) 300mm water main passes under canal at Ardmore Road.
- (v) 1200mm culvert passes under canal at Woodlands Estate, Athlone Road.
- (vi) 300mm water main passes under canal at Woodlands Estate, Athlone Road.
- (vii) 600mm foul sewer passes under canal at Woodlands Estate, Athlone Road.
- (viii) 600mm foul sewer passes under canal at Springfield Tunnel.
- (ix) Siphon culvert under canal at Charlestown Townland, Mullingar.
- (x) Embanked section at Springfield, Mullingar.
- (xi) Embanked section at Millmount, Mullingar.
- (xii) Embanked section opposite the Woodlands, Willow Brook and The Moorings housing estates, Mullingar.

### **A3.2.3 Waterways Ireland Emergency Procedures to prevent and deal with a Canal Breach**

Waterways Ireland (WWI) is one of the six North/South Implementation Bodies established under the British Irish Agreement in 1999. WWI has responsibility for the management, maintenance, development and restoration of inland navigable waterways principally for recreational purposes. The waterways under the remit of the body are the Barrow Navigation, the Erne System, the Grand Canal, the Lower Bann, the Royal, the Shannon-Erne Waterway and the Shannon Navigation. The headquarters for WWI is in Enniskillen, and regional offices are located in Carrick-on-Shannon, Dublin and Scarriff.

WWI has developed emergency procedures to prevent and deal with a Royal Canal breach in the Mullingar area.

- (i) Inspection of embanked section from Saunders Bridge to Grange-Newbrook Bridge on a weekly basis.
- (ii) Twice daily monitoring of the sluice gates at Lough Owel and monitoring of the lake level.
- (iii) Stop gates installed at the Downs Bridge are checked weekly.
- (iv) Stop planks located under Grange-Newbrook Bridge to dam the canal in event of a breach situation.
- (v) Pipe throttle installed at Fish Farm at Cullion to regulate water entering the Royal Canal at the Summit.
- (vi) Mullingar summit level kept 300mm below design level to prevent water overtopping the bank and overflow installed at the Downs adjusted accordingly.



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### **A3.2.4 Emergency Notification**

There are several ways in which an emergency may be reported and an emergency response initiated. The normal ways are as follows:

- (i) WCC crews while carrying out routine works in the area may encounter incidents or accidents which may warrant implementation of the emergency procedures.
- (ii) Members of the public may notice a potential breach of the canal occurring.
- (iii) The Emergency Services may be notified directly of an incident by members of the public.
- (iv) Waterways Ireland carries out weekly inspections of the embanked section of the canal from Saunders Bridge to Grange-Newbrook Bridge and may notice a breach.
- (v) Waterways Ireland monitors the level of Lough Owel on a daily basis and also the condition of sluice gates on the Canal Supply at Lough Owel and may discover a potential problem.

All of these groups would be expected to contact the Area staff and report the incident, ideally with the following information:-

- (i) Time of incident.
- (ii) Location of the incident.
- (iii) Number of injured (any persons trapped).
- (iv) Number of properties affected.
- (v) Details of WWI response in relation to limiting the water leaving the canal.

### **A3.2.5 Emergency Response - Strategic Aims.**

Upon notification of a canal breach, the Area Engineer (AE) or Senior General Services Supervisor (SGSS) will contact WWI and the Emergency Services and deploy MAO staff and equipment as required to assist WWI in controlling any breach of the canal bank.

At the scene, the AE will coordinate the MAO activities in conjunction with the SGSS and WWI personnel. The coordination will include but is not limited to the following actions:-

- (i) Work closely with WWI to assist in any requirements they might have regarding implementing their emergency procedures for a Royal Canal Breach. (See Clause A3.2.3).
- (ii) Implement any road closures/diversions as necessary. All diversions/road closures to be done in accordance with Chapter 8 of Traffic Manual. Maps to be made available online as soon as diversion/road closure put in place.
- (iii) Divert flood waters away from property at risk either by pumping into local surface water sewer or diversion into temporary attenuation ponds for later pumping back into the Canal itself or the River Brosna where applicable.
- (iv) Evacuate any houses which may be flooded or at risk of flooding with assistance of Garda Siochana / Civil Defence / the Defence Forces (high level trucks may be required) and liaise with Housing Section regards available emergency accommodation.
- (v) Carry out risk assessment having regard to public safety.
- (vi) Activate and maintain incident log.
- (vii) If necessary arrange for assistance from adjacent area offices, local authorities, Civil Defence, Defence Forces.
- (viii) Keep WCC Press Officer informed so they can address/inform the media as necessary.

### **A3.2.6 Emergency Response - Operational Procedure.**

Once the Area Engineer (AE) or Senior General Services Supervisor (SGSS) has received the information relating to the emergency incident and depending on the severity of the incident, he/she will notify and mobilise the relevant persons and equipment as detailed below.

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The Area Director of Services (DoS) will be informed immediately, in the event of:

- (i) Environmental Emergency
- (ii) Fatality
- (iii) Severe property damage

The following actions should be carried out under the direction of the Area Engineer:

- (i) AE/SGSS will contact Waterways Ireland immediately.

Agency.	Name.	Mobile No.	Office Number.
Waterways Ireland, out of hours.	William Rigney		(046) 9431006
	Local Water Patroller.	(087) 6182104	
Waterways Ireland.	Jean Errity.	(087) 8278016	(044) 9374940
Waterways Ireland.	Michael Baine.	(086) 8059343	

- (ii) AE/SGSS will locate the exact location of canal breach if Waterways Ireland is unavailable. Severity of the breach will be assessed and following actions carried out if situation warrants.
- (iii) AE/SGSS will mobilise Westmeath County Council staff, minimum five crews to be mobilised.
- (iv) AE/SGSS will ensure the affected area is closed off to public.
- (v) AE/SGSS will ensure one WCC crew close the sluice gates at Lough Owel. (See Fig A3.2.4 & Fig A3.2.5). Lock keys and gate keys are available in the emergency stores.
- (vi) AE/SGSS will ensure one WCC crew will check that the lock gates at the Downs have automatically closed. If not, these must be closed manually. (See Fig A3.2.2).
- (vii) AE/SGSS will ensure one WCC crew will check that the lock gates at Coolnahay Bridge are in the open position to lower the level of water in the canal (see Fig A3.2.3), and if not will open these lock gates.
- (viii) AE/SGSS will mobilise Plant & Equipment as required (see Clause A3.2.7). Construction of dams will take place in locations as determined by the breach location (see Fig A3.2.7). Method statement for construction of dams is contained in Clause A3.2.7.
- (ix) AE/SGSS will contact An Garda Siochana to carry out emergency evacuations if required. Civil Defence may be required to assist.
- (x) AE/SGSS will contact Westmeath County Council Housing Section who will provide emergency accommodation as required.
- (xi) Contact details for emergency rest centres are in Appendix 18 of the Major Emergency Plan.
- (xii) Contact details for bus companies are in Appendix 16 of the Major Emergency Plan.

### **A3.2.7 Damming Method Statement for Royal Canal.**

Both planking and damming of the canal will be carried out by WWI.

- (i) Four damming points have been identified, namely Grange, east of Scanlan's Bridge (aka Harbour Bridge), west of Moran's Bridge and east of Saunder's Bridge (see Fig A3.2.7). It has been confirmed by Waterways Ireland that all damming points are on their land and all have access from the public road.
- (ii) The construction of temporary dams on the Royal Canal will be with the aid of Puddle Clay (Boulder clay may be used in emergency situations). Approximately 400 tonnes of clay is required per dam.
- (iii) A stockpile of approx. 400 tonnes of puddle clay is available at Waterways Ireland Storage Depot at Saunder's Bridge. (See Fig A3.2.7).
- (iv) Additional Puddle Clay can be sourced from Ballycrystal Enterprises Ltd., Geashill, Tullamore, Co. Offaly (057)9343731. The haulage time for 400 tonnes is approximately 1hr 30mins.
- (v) Long reach excavators are preferable for construction of dams. Waterways Ireland has two long reach excavators available. Further excavators, dumpers and pumps and other plant can be hired. See Appendix 16 of the Major Emergency Plan.

- 
- (vi) Dams should be constructed at locations shown on Fig A3.2.7 and in relation to area of the breach.
  - (vii) The puddle clay for the dams will be stockpiled at the hardstanding areas adjacent to the dams. One dumper & two excavators will be required to transport and place the puddle clay.
  - (viii) Provision must be made to maintain the level of water within the canal at all times when artificial damming is in place. This may be achieved by strategic pumping either side of the dam/s or using the canal supply route if possible.
  - (ix) When dams are required to be removed a small section from the top of the dam will be removed to allow the drained area to slowly refill. Waterways Ireland will assess if any necessary relining used is adequately sealed before the canal is fully opened.
  - (x) Once this is established the dams are then fully removed using a toothless bucket on excavator. The removal of any temporary dam will be carried out by Waterways Ireland.

**Plant & Equipment Required per dam:**

Excavator x 2.

Site Dumpers x 1.

150mm Pumps x 4.

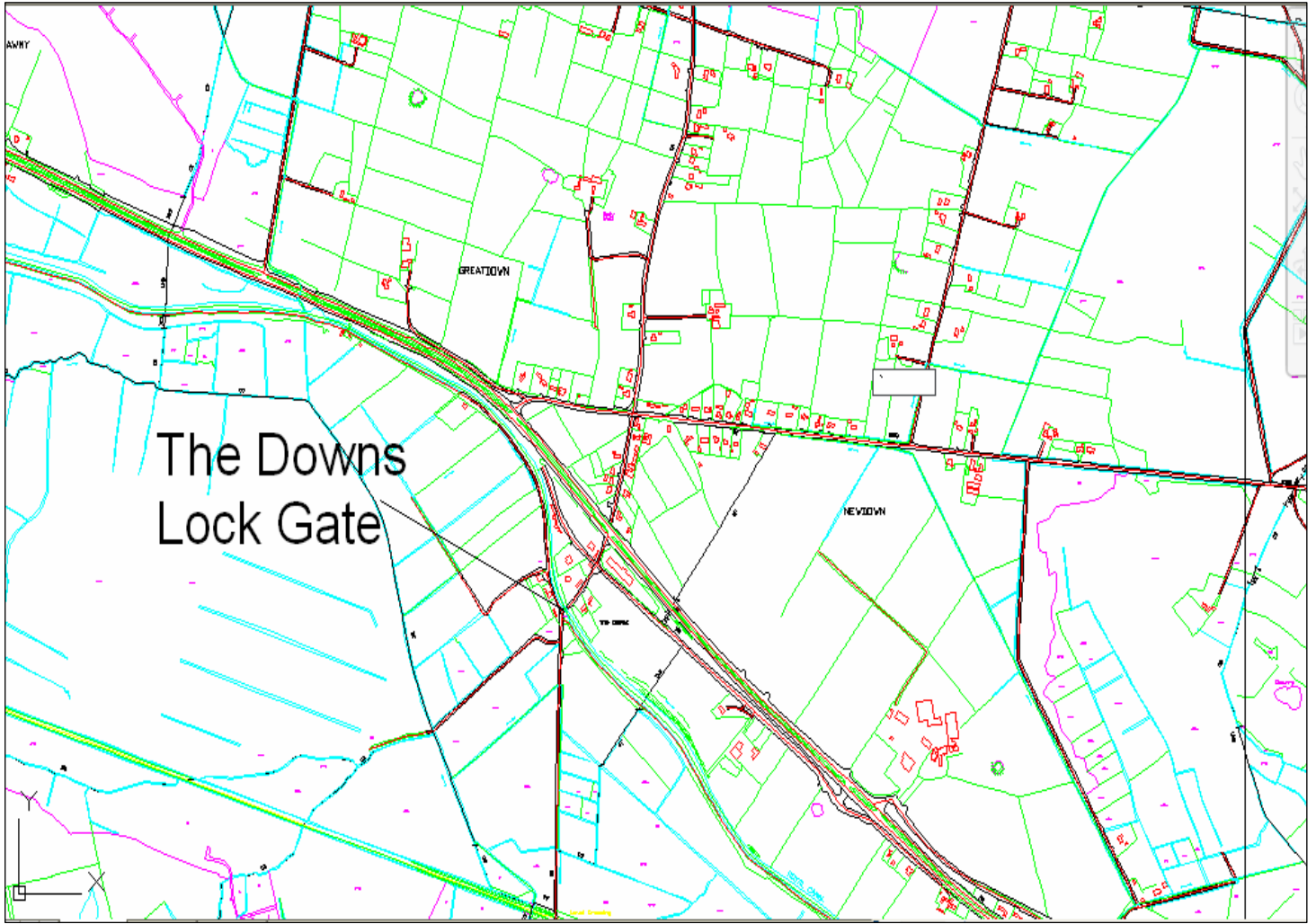
50mm submersible pumps x 2.

12 ton 360° Excavator.

5 WCC Crews minimum.

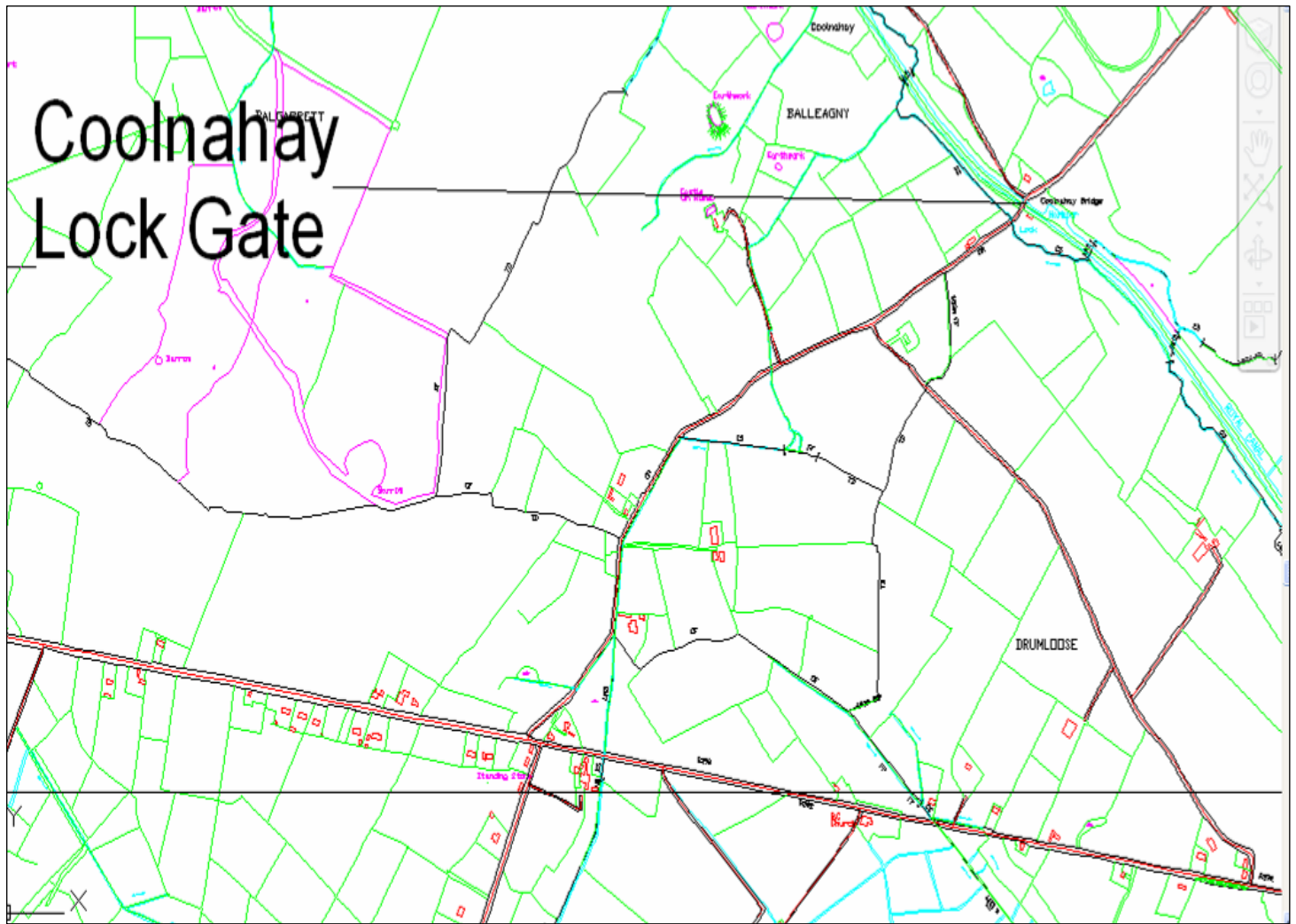
NOTE: Electro-fishing of the canal may be required. Please contact Dr. Joe Caffrey (087) 6468609, Central Fisheries Board, if necessary.



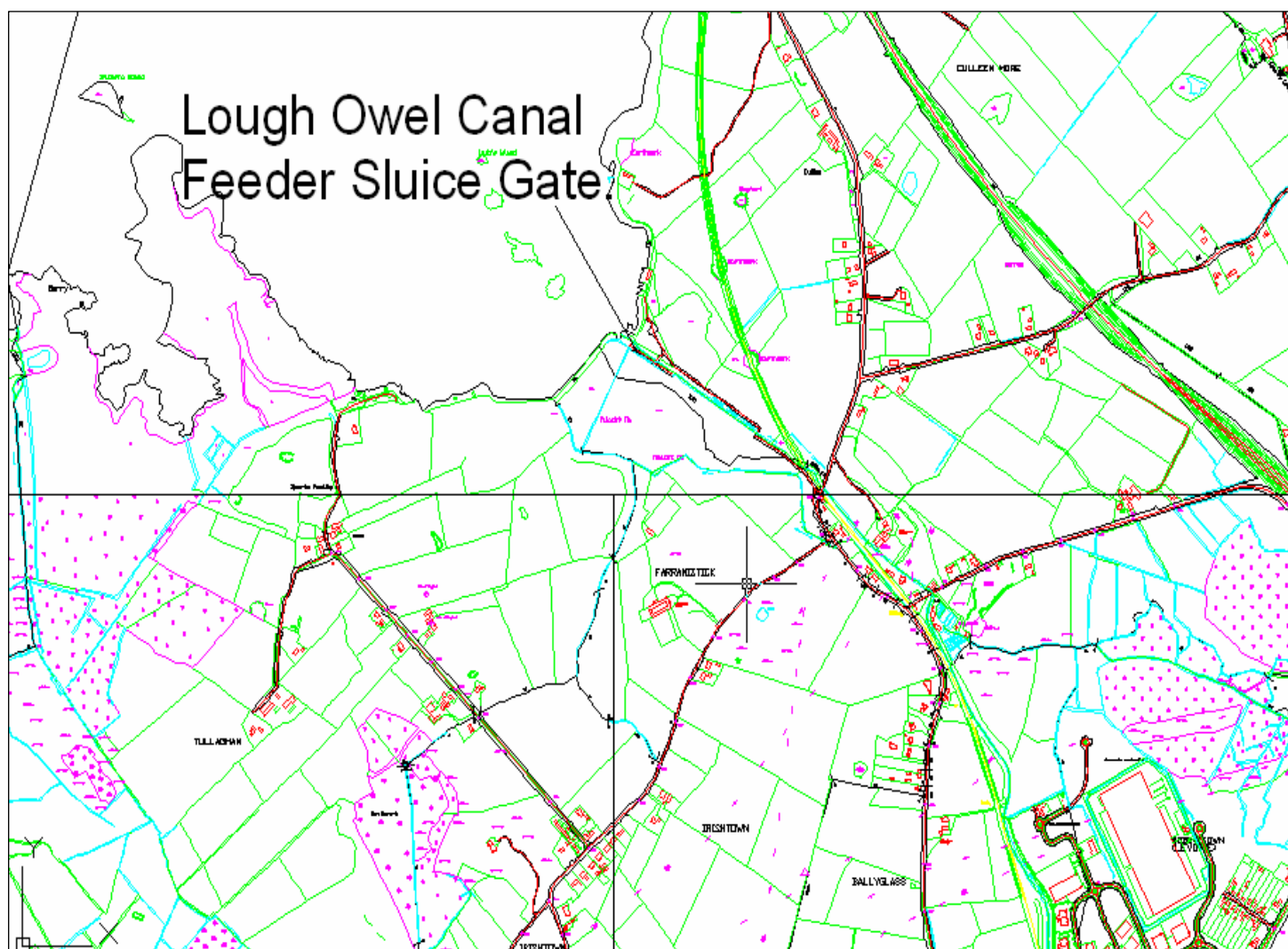


**Fig A3.2.2: Map showing The Downs Lock Gate location.**





**Fig A3.2.3: Map showing Coolnahay Lock Gate location.**

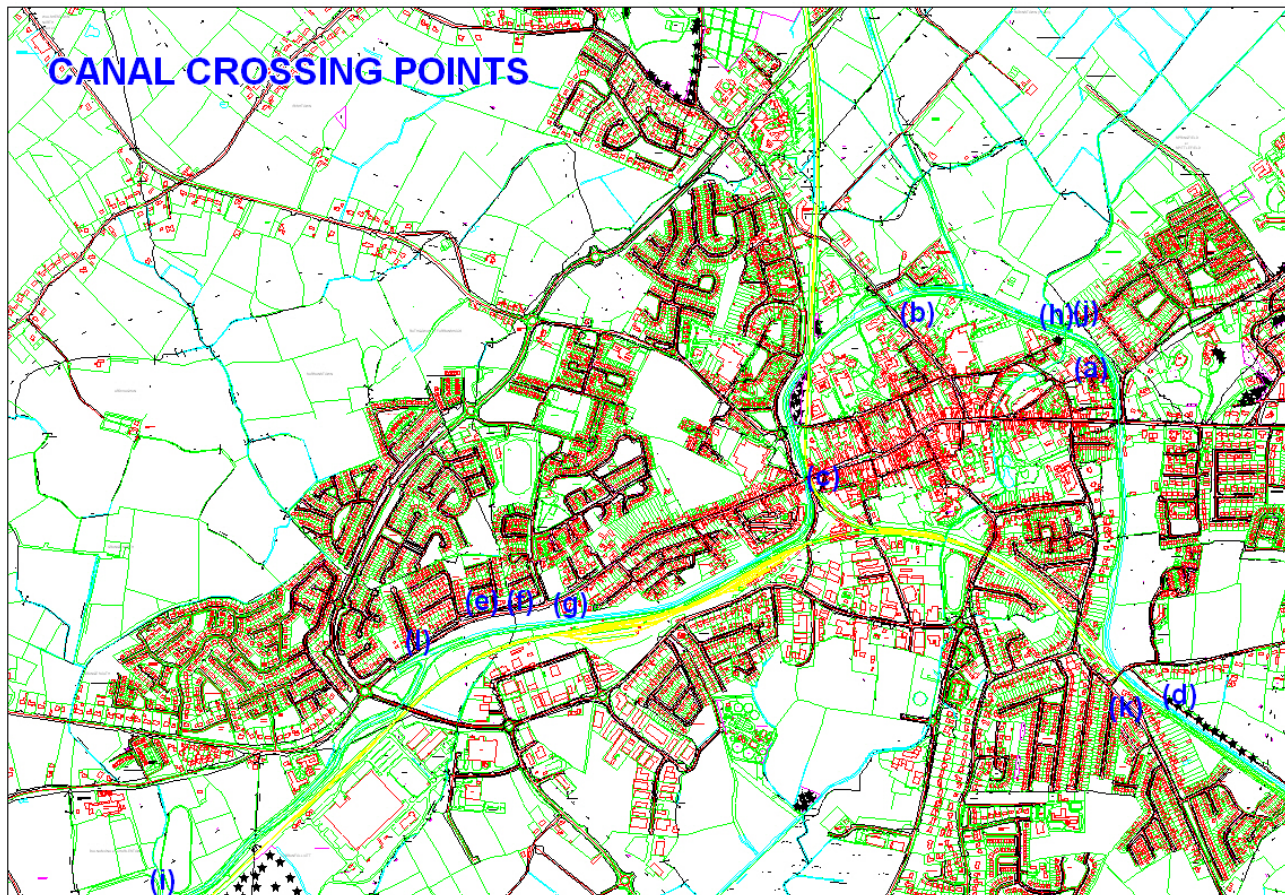


**Fig A3.2.4: Map showing Lough Owel Sluice Gate location.**



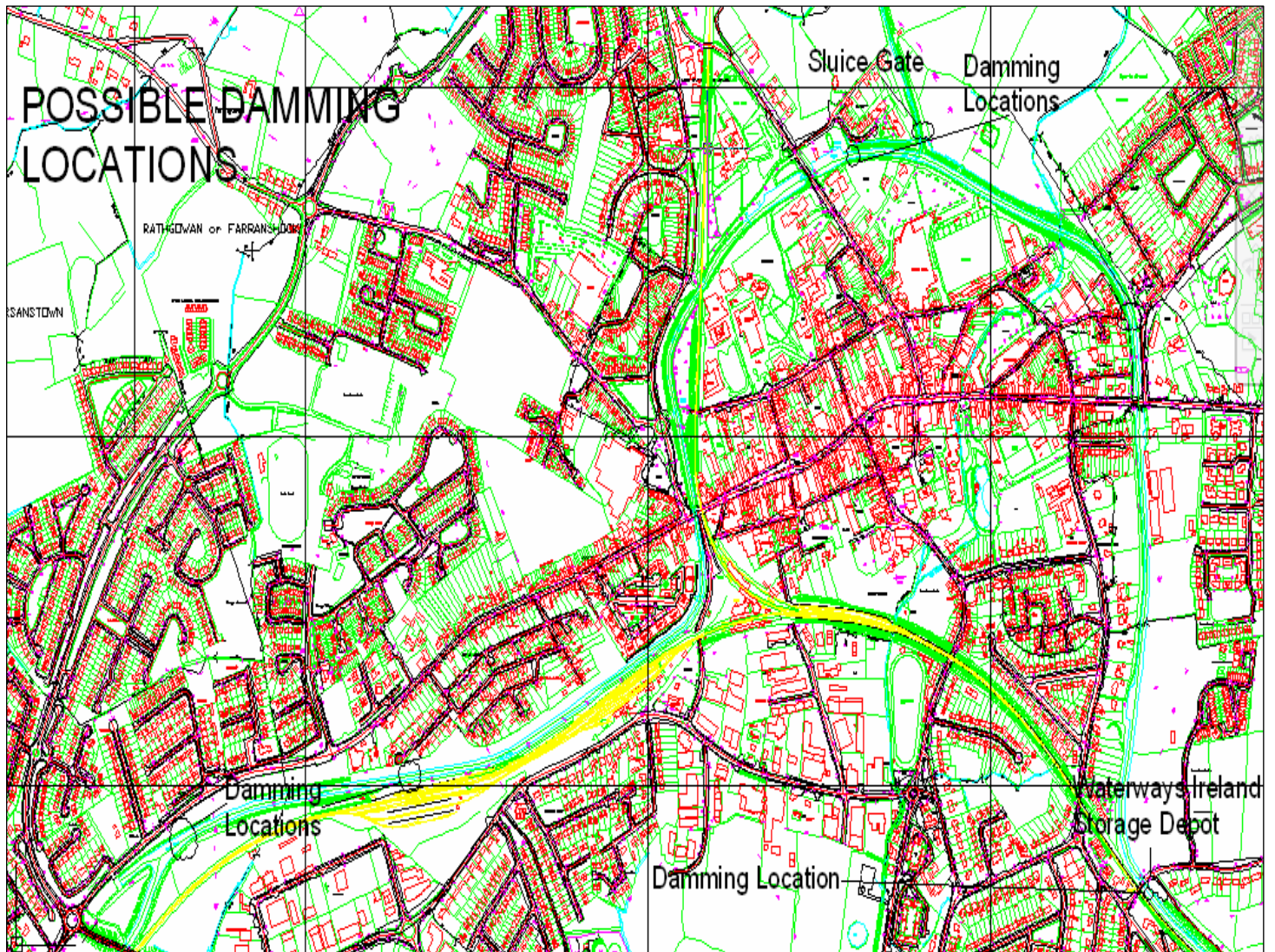
**Fig A3.2.5: Picture of Lock Gate Detail at Lough Owel.**





**Fig A3.2.6: Map showing Royal Canal Crossing Points.**

- (a) 75mm water main in South embankment in Springfield.
- (b) 225mm foul sewer passes under canal at Scanlan's Bridge (aka Harbour Bridge).
- (c) 300mm combined sewer passes under canal at Railway Row.
- (d) 300mm water main passes under canal at Ardmore Road.
- (e) 1200mm culvert passes under canal at Woodlands Estate, Athlone Road.
- (f) 300mm water main passes under canal at Woodlands Estate, Athlone Road.
- (g) 600mm foul sewer passes under canal at Woodlands Estate, Athlone Road.
- (h) 600mm foul sewer passes under canal at Springfield Tunnel.
- (i) Siphon culvert under canal at Charlestown Townland, Mullingar.
- (j) Embanked section at Springfield, Mullingar.
- (k) Embanked section at Millmount, Mullingar.
- (l) Embanked section opposite the Woodlands, Willow Brook and The Moorings housing estates, Mullingar.



**Fig A3.2.7: Map showing Possible Damming locations.**



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#### **A4.0 Flood Management Procedure for Kilbeggan& Coole areas**

A flooding risk analysis for both these Areas has been carried out. It shows that, while some spot flooding may occur on occasions, neither Area is prone to significant fluvial flooding. It is considered that in these Areas the engineering staff of Westmeath Co. Co. will be able to deal with any spot flooding which may occur. The equipment provided in the emergency stores in each Area should be adequate in such an event. (See Section A5 below).

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## A5.0 Major Emergency Stores

The four engineering areas, Athlone, Mullingar, Kilbeggan and Coole, each have a store with the equipment listed below for use in the event of an emergency including a major emergency. The Senior Executive Engineer in each area is responsible for ensuring that the store is fully stocked at all times.

### A5.1 Emergency Stores List

#### Cones and Signs

Item No.	Equipment	Quantity	Use
1.	Cones (750mm) ( +400x1m on IPV)	20	Traffic Control
2.	Signs-Traffic Diverted Right	5	Traffic Control
3.	Signs-Traffic Diverted Left	5	Traffic Control
4.	Signs-Traffic Diverted Straight	10	Traffic Control
5.	Signs-Accident Ahead	6	Traffic Control
6.	Signs-Blue Arrows	5	Traffic Control
7.	Signs – Blue Arrows Left	5	Traffic Control
8.	Signs – Oil Spillage	10	Traffic Control
9.	Signs – Road Flooded	10	Traffic Control
10.	Signs – Road Closed	4	Traffic Control
11.	Signs – Stop/Go	3	Traffic Control

#### Protective Clothing

Item No.	Equipment	Quantity	Use
1.	Pairs of Gloves	10	General
2.	PVC Wetsuits	4 size XL & 6 size L	General
3.	Pairs of Goggles	6	General
4.	Luminous Jackets + Leggings	6	General
5.	Hi-viz Vests	6	General
6.	Sets of disposable overalls	12	General
7.	Sets Ear Defenders	2	General
8.	Wellingtons	2 pair size 9, 2 pair size 10	General
9.	Waders	2 pair size 9, 2 pair size 10	General

#### Torches/Lamps

Item No.	Equipment	Quantity	Use
1.	Hand Torches and Batteries	6	General
2.	Flashing Units and Batteries	12	General
3.	Spare 9v Batteries	12 – 1 box	General

## Tools and General Equipment

Item No.	Equipment	Quantity	Use
1.	Shovels – Flat,	4	General
2.	Shovels - Road	2	General
3.	Drags	3	General
4.	Brushes	6	General
5.	Briar Hooks	2	General
6.	Crowbar	1	General
7.	Sledge Hammer	1	General
8.	Pickaxe c/w handle	1	General
9.	Hacksaw, 2 Blades,	1	General
10.	Bushman Saw	1	General
11.	Claw Hammer	1	General
12.	Manhole Keys	2	General
13.	Knife	1	General
14.	4in Chainlink	1 roll	General
15.	Bull wire	1 roll	General
16.	Fenceposts	8	General
17.	Tying Wire	1 roll	General
18.	Nylon rope	25m	General
19.	Timber Planks	4	General
20.	Polythene Sheet –Heavy Gauge	2 rolls	General
21.	Twine	1 ball	General
22.	Lime-hydrated	10 Bags	General
23.	Wire Nails – 4in	1 kg	General
24.	Wheelbarrow	1	General
25.	Red/White Bunting	1 roll	General
26.	Oil dispersant dispensing trailer	1	General
27.	Oil dispersant	10 Drums (25l)	General

## Sandbags

Item No.	Equipment	Quantity	Use
1.	Empty Sandbags	400	Flooding
2.	Full Sandbags	100	Flooding
3	1 Tonne Sand bags (Athlone Stores only)	1500	Flooding

## Pumps

Item No.	Equipment	Quantity	Use
1.	Diesel Water Pumps (Athlone Stores only)	2	

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**Specialist Vehicle**

<b>Item No.</b>	<b>Equipment</b>	<b>Quantity</b>	<b>Use</b>
1.	<b>High Axle Vehicle</b> (Based in Athlone but available throughout County if needed)	1	General

**Environment Incident Stores**

<b>Item No.</b>	<b>Equipment</b>	<b>Quantity</b>	<b>Use</b>
1.	Closed trailer which can store items listed below – in Mullingar and Athlone stores only	1	Environment incident
2.	6 inch Oil Boom	4 Bales (4 booms per bale)	Environment incident
3.	10 inch Oil Boom	4 Bales (4 booms per bale)	Environment incident
4.	Plastic Shovels	4	Environment incident
5.	6 inch Chemical Booms	4 Bales (4 booms per bale)	Environment incident
6.	GP 100 Universal Pads	2 Bales (100 pads per bale)	Environment incident
7.	Betonite Drain Covers	6	Environment incident
8.	SSI 15 P Oil Rolls	2 Bales (2 per bale)	Environment incident
9.	Oil Pads	2 Bale (100 pads per bale)	Environment incident
10.	Chemical Absorbent Rolls	2 Bales (2 per bale)	Environment incident
11.	Chemical Absorbent Pads	2 Bale (100 pads per bale)	Environment incident
12.	Plastic Bags	100 heavy duty clear plastic 100 litre bags ( used to store spent booms)	Environment incident
13.	Fencing post	20 (farm size posts 3-4 inch wide)	Environment incident
14.	Chicken wire	4 rolls	Environment incident
15.	Bales of straw	10	Environment incident
16.	MDF	5 sheets	Environment incident
17.	Brushes	6	Environment incident
18.	Moss Peat	4 Large Bales	Environment incident

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## Appendix B

### B1.0 Are you at risk from flooding?

#### B1.1 Warning signs

Simple ways to assess the risk of flooding to your property are to find out the history of flooding in the surrounding area and to consider the area around your property.

**For example, your house may be at risk from flooding if:**

- Your house has flooded in the past.
- Flooding has occurred before in your area.
- There is local concern in your community about the risk of flooding.
- Your house is near an open water source, such as a river, the sea, a lake, a stream, ditches or drains.
- Your house is in a hollow or a low-lying area where floodwater could collect.
- Ordnance Survey maps indicate 'liable to floods' at the location of your property.

If you have not lived in the area for long, your neighbours or a local historian might know if any floods have occurred in the area.

Information in relation to areas of the country that may be prone to flooding is available on the Office of Public Works website [www.floodmaps.ie](http://www.floodmaps.ie) which can also be accessed via the main OPW website [www.opw.ie](http://www.opw.ie)

**If your property fits into any of the criteria noted above then you could be at risk from flooding due to:**

- Rainfall filling rivers, streams and ditches beyond their flow capacity.
- Floodwater overflowing river banks and flood defences onto floodplains.
- Coastal storms leading to overtopping and breaching of coastal flood defences due to storm surge and wave action.
- Blocked or overloaded drainage ditches, drains and sewers overflowing across roads, gardens and into property.
- Overloaded sewers back flowing into property.
- Rain that is so heavy that run-off flows overland down hills and slopes.
- Rain soaking into the ground causing ground water levels to rise and flood.

It is important to remember also that while flood defences, such as walls or embankments, do provide some protection against flooding, they do not provide total protection. Flooding of areas behind such defences can occur from water behind the defences being unable to drain away (such as storm water from heavy rain) or from floodwaters spilling over the top of defences in particularly extreme events. If your property is behind a defence, it will flood less frequently than if the defences were not there, but it will still be at some risk.

#### B1.2 How does water get into the house?

There are many ways for flood water to get into your house. Entrance points include walls, doors, windows, floors, services and drains.

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### **Above ground**

Floodwater can enter your house above ground in the following ways:

- Through doorways and windows (even if they're closed!)
- Through airbricks or other ventilation openings
- Through other gaps and around pipes and cables that pass through walls
- Through party walls if the property next door is flooded
- Through cracks in the brickwork
- Through permeable, weathered or damaged brickwork, blocks, stone and mortar
- At the damp proof course

### **Below ground**

Floodwater can move underground before it becomes visible on the surface. Below ground floodwater can enter your house in the following ways:

- Rising up through the floors (or through the walls of cellars or basements) in areas where the ground is made of permeable material, such as chalk, gravel or sand
- Through drainage trenches in impermeable ground
- Through drains and pipes leading into the house including:
  - Toilets
  - Sinks
  - Baths
  - Washing machines
  - Dishwashers

## **B1.3 How will my property and belongings be affected?**

Exposure to floodwater can cause severe damage to your property and belongings. As well as the risk to items that would be damaged if, for example, they were dropped in the bath (such as electrical goods), flood water is usually very dirty and may be contaminated with sewage and silt which can cause additional damage. If the floodwater comes from the sea or a tidal estuary, the salt can cause irreparable damage to any metal item in the house.

### **Items most at risk are:**

- Furniture.
- Wall finishes.
- Wood.
- Fittings and fixtures.
- Electrical goods.
- MDF or chipboard furniture.
- Floor finishes.
- Electrical circuitry.

Also at risk are personal effects such as photographs, paintings and paperwork that would be difficult or impossible to replace/repair. In extreme cases flooding can also compromise a property's strength and cause a building to collapse, particularly in very deep or fast flowing water.

The level of damage caused by a flood can vary with the depth of the water and the duration of the flood. Usually the higher the water level, the worse the damage. Once the water rises above floor level it can come into contact with the interior furnishings and fittings in your house, causing damage.



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## **B1.4 How will the flood affect me?**

Flooding will affect you and your family both financially and emotionally. Damage to your property is only part of the cost of flooding. Repairs, restoration and cleaning up, as well as temporary accommodation for your family while work is being carried out, can all push up the cost. The period after a flood can be a very stressful time as you realise the extent of the damage and the loss of personal items, on top of trying to organise workers to repair and clean up your property.

## **B2.0 How can I protect against floods?**

### **Warning!**

In cases of severe flooding (where floodwater rises above 1 metre) keeping water out of your property can be more harmful than letting it in. The stress on the building caused by that amount of water can damage the structure and foundations of the building. Therefore you should never block doors, windows or air-vents over 1 metre in height.

### **B2.1 What about sandbags?**

It is a good idea to always have a supply of sandbags at hand if you live in a flood risk area. If you do not have sandbags you can use alternatives such as pillow cases or refuse sacks filled with garden soil.

- Remember not to fill them too early or far away from the site where you need them as they can get very heavy, very quickly.
- When filling a sandbag wear protective gloves as sand is abrasive.
- Do not fill the bags more than half full. It is not necessary to tie the ends of the bags, simply tuck the open ends underneath when you are stacking them.
- Remove any debris from the area where the bags are to be placed.
- Place the half filled bags lengthways and parallel to the direction of the water flow.
- Place bags in layers like a brick wall, make sure that in the next layer each bag overlaps the one below by half.
- Stamp bags firmly into place to eliminate gaps and create a tight seal.
- If you need sandbag protection which is more than three layers high, build them up in a pyramid style: begin with a base more than four sandbags thick and then build upwards, tapering towards the top.
- For extra waterproofing cover your sandbag wall with plastic sheeting, making sure to weigh it down with additional sandbags.
- Although sandbags are a popular defence against floods they do have their disadvantages.
- During an emergency, sufficient quantities may be difficult to obtain.
- They are time consuming and require two people to fill.
- They can be difficult to handle, particularly for the elderly or infirm.
- When they come into contact with floodwater, they tend to retain contaminants such as sewage.
- Sacking material is biodegradable and can disintegrate if left in place for long periods of time.

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## **B2.2 What are floodboards?**

Floodboards (or flood barriers) are removable barriers that can be placed across openings, such as doors, in the event of a flood. There are a number of specifically designed, commercially available products that can be bought and fitted. If you buy floodboards, you should look for a product that has a quality assurance mark (such as the 'kite' mark).

It is also possible to make your own floodboards, although care should be taken to make sure that the barrier is strong enough and that it fits properly in the opening for which it is intended to form a proper seal.

The easiest way to make floodboards is to construct a wooden or metal barrier that is secured flat against a wall, door or across gateways or paths by means of a frame. The pressure of the floodwater itself will help seal the barrier. The efficiency of the boards will be determined by the strength of the walls and the durability of the frame fittings. The most common type of flood board is one which can slide down into the frame, as this can be removed easily when not needed. But you can also make a hinged variety which can swing closed across any gaps. It is important that floodboards fit precisely. If in doubt it may be best to buy specialist items.

## **B2.3 How does wrapping work?**

Wrapping is an advanced method of reducing the effects of floodwater by enclosing the bottom 600 – 900 mm (2-3 feet) of a property in plastic sheeting.

The process involves digging a trench in front of the wall you wish to protect. The plastic sheeting is attached to the wall above the expected height of the floodwater. It is run down the wall and placed over a drainpipe at the base, before being run through the trench and secured on the other side with weights or sandbags. Wrapping a building takes some DIY ability and needs to be started well before any floodwater arrives as it does take some time. Alternatively there are commercially available products that can be bought and fitted to your property.

Check what kind of soil your house is built on. If it is porous (e.g. chalk) then the floodwater could easily come up through the ground. In this case it is better to spend time removing valuables or putting them upstairs rather than wrapping your home or fitting floodboards.

## **B2.4 Flood protection products**

There are many ready-made flood protection products available to buy from a variety of companies to help mitigate the effects of flooding. Here are some examples.





### Floodbags

Floodbags are water absorbent bags supplied in boxes of 20 "drybags". A box of 20 bags weighs approx. 13Kg & they have a shelf life of up to 10 years. After 10 mins. in freshwater the bag will have absorbed 20Lit. of water to give a bag of 20Kg with a size of 525 X 400 X 200mm. Consistent size & shape makes the Floodbag a more effective barrier than conventional sandbags. Bio-degradable after use.



Dry bag ready  
for deployment



Filled bag after  
10 mins. in water

### EZ bag kit

The EZ bag kit consists of sandbags (14" X 26"), the EZ bagger filling tool & a pair of workgloves. Bags are Kits are supplied as 50 bag & 100 bag kits. The filling tool is designed to hold the sandbag open while filling in a scoop & tilt motion so that bag filling is a single person operation.



### Floodwater bag

A reusable alternative to sandbags, these plastic floodbags are filled with a bio-degradable polymer and water. They are hygienic, reusable & economic alternative to sandbags.



step 1



step 2



step 3



step 4

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### Sand bag hopper

Many man hours are lost filling sandbags. The Sand Bag Hopper takes a standard JCB front end bucket load of sand. No electrical supply, no hydraulics, the hopper has two gravity fed outlets & two men can fill up to 500 bags per hour. The unit is easy to erect and is portable.



Single man sand hopper weighs only 10Kg. It is very compact & easy to transport. One man with a sandhopper can fill three times more bags.



### Flood gates and Flood Barriers

These come in a variety of shapes and sizes, and can be used to prevent floodwater entering your property. Some examples are shown below, but see Paragraph B2.5 for specific flood barriers for domestic doors and industrial doors and for large openings



### B2.5 How to protect your home or business

You must protect your own home or business. During a flood, water ingress will be via three openings, **doorways, pipes/drains, and air vents**. These openings can be sealed on a temporary basis using products available from a number of suppliers. Examples of flood protection products are shown below.

#### Flood barriers for domestic doors

This type of product physically seals your doorway at times of risk & is a removable barrier. It is an expandable barrier & no permanent fixings are required. The water seal is achieved by the neoprene rubber sleeve.





**Outside View**

**Inside View**

### **Flood barriers for industrial doors**

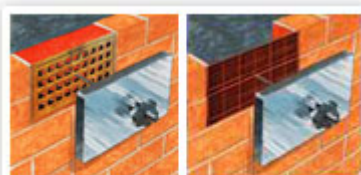
This type of product physically seals your doorway at times of risk & is a removable barrier. It is an expandable barrier & no permanent fixings are required. The water seal is achieved by the neoprene rubber sleeve.



**Removable Barriers for Industrial doors or large openings**

### **Air vents**

Air vents or air bricks must be sealed during a Flood Risk Period. A number of types of temporary covers are available to seal these openings.



**Air Brick Cover**



**Air Vent Cover**

### **Pipes and drains**

Pipes & Drains can be temporarily blocked using an expandable buns or one way valves can be permanently fitted in drains & sewage pipes to prevent backflow. One way valves fitted in the main drainage pipes are a permanent fitting & prevent backflow. An inflatable PIPE BUNG can seal temporarily main drain pipes or toilet bowls to prevent backflow.



**Non Return Valve**



**Pipe Bung**



**Waste Pipe Valve**

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## **B3.0 How can You Prepare for Floods?**

### **B3.1 Be Prepared**

If you live in a flood risk area you should always have preparations ready in case of a flood. Preparing a plan for what you should do in the event of a flood is well worth the time it may take – it could save you a lot of money, inconvenience, stress and could even save your life!

### **B3.2 Your Family Flood Plan**

As well as protecting your house against flooding, there are some things you can do to be prepared for a flood, so that when it comes you are ready and know what to do to make sure that you, your family and your most precious belongings are safe.

- Floods can happen very quickly and without warning, so it is a good idea to have a family flood plan in place so that everyone knows what to do in case of an emergency. Outlined below are some things that you might think about or do to make sure that when a flood comes, you're prepared.
- Keep a list of emergency numbers close to the phone, or stored in the memory of your phone or mobile.
- Make up a flood kit and ensure everyone knows where to find it. Your flood kit should consist of a torch, some warm and waterproof clothes, a battery or wind up radio, rubber gloves, Wellington boots, a first aid kit and blankets.
- Make a list of children's essentials that you will have to bring with you if you are evacuated. For example – milk, baby food, sterilised bottles, nappies, a favourite teddy or toy.
- Think about which of your possessions are most valuable to you, including expensive items, but also more importantly, those things that money can't replace, such as photo albums, family heirlooms, etc. List the items out and make sure you know where these things are so that if a flood comes, you can move them quickly to safety.
- Does anyone in your family need medication? If so don't forget to take it with you.
- Gas and electricity. Make sure you know where the shut off points are. Could you find them in the dark?
- Have a prearranged place that you can safely move your car to if you have time.
- If you have to evacuate do you have somewhere to go, and will you be able to get there, bearing in mind that some roads might be blocked by the flood?
- If you have elderly or disabled family members in the house, how might you get them out safely?
- Don't forget your pets. Ensure you have somewhere safe for them to go. If you are evacuated can you keep them with you or will they need to be kept elsewhere?
- There are a number of actions you can take immediately before a flood that can reduce or prevent some of the flood damage. These are listed under Paragraph B4.1 *A Flood is Coming! What do I do?* Think about these actions. Which are relevant to you? Which might you be able to achieve if a flood is imminent? Which would be your priorities?
- Practice your flood plan. Make sure that everyone knows what has to be done and what it is safe to do.

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### B3.3 Insurance Cover

When claiming for flood damage on your insurance remember the do's and don'ts below:

- **Do** make sure that you have home insurance and that you are covered for flood damage
- **Do** telephone your insurance company's 24-hour emergency helpline to get the process started as soon as possible.
- **Do** commission immediate emergency pumping and repair work to protect your property from further damage.
- **Do** get advice from your insurance company on reputable contractors and builders.
- **Do** check your policy booklet to see if the loss or damage is covered under your policy (see also your insurance company's website). If so, check the limits of such cover.
- **Do** complete the claim form confirming the cause of damage and enclose repair/replacement estimates.\*
- **Do** check with your insurer if you have to move into alternative accommodation, as this is often covered by your policy.
- **Do** make sure your insurance company knows where to contact you if you have to move out of your home.
- **Do** keep an inventory of all your written and telephone correspondence with your insurance company.
- **Do** record the damage caused by the flood on a camera or video recorder.
- **Do** mark the water levels on the walls for reference.
- **Don't** begin any work without the approval of your insurance company.
- If possible **don't** throw anything out before it is seen by an assessor, alternatively photograph items before disposal.

\*Remember your insurance policy is not a maintenance contract. Normal wear and tear is not included under your policy.

### B3.4 Advice for Elderly & those with Mobility Difficulties

The safety of older people or those with mobility difficulties is one of the most important things to consider in a flood.

- Make sure that an elderly or immobile family member, neighbour or friend has a place to stay in the event of a flood.
- If you have a disability contact your Health Board and ask them how they will help if you are at risk from flooding.
- Plan an escape route, particularly if you are in a bungalow.
- If you live in a house and have window locks, always keep a key upstairs so that you'll be able to let rescuers in.
- Make a list of useful numbers and keep it in a safe place. The list should include:
  - Family and neighbours who can help.
  - Your Local Authority & HSE office and Garda Station.
  - Your insurance company claim and emergency numbers.

### B3.5 What can I do with my Pets?

Do you have a plan for your family pet in case of a flood? Having supplies and a plan before a flood occurs will give you peace of mind, save precious time and maybe even your pet's life.

- Make sure that your pet has a durable name tag with your name and phone number on it.
- If floodwater enters your property, place pets upstairs or in cages above water level.

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- Is there someone who could look after your pet for the duration of the flood if you have to evacuate?
  - In the event that you may need to evacuate your house you will need supplies for your pet, such as:
    - a sturdy crate and/or carrier/cage.
    - a pet first-aid kit.
    - a leash and harness or collar.
    - non-spill bowls.
    - for cats, litter box and litter.

### **B3.6 How will I Know a Flood is Coming?**

If you are in a flood risk area, there are various ways to know if a flood might be coming, including: Met Éireann Weather reports (Radio, TV, Internet [www.met.ie](http://www.met.ie) ), Local Radio, Westmeath Co. Co. website <http://www.westmeathcoco.ie> These might give a warning that heavy rain or flooding is expected.

Local water levels – Checking to see if water levels in the nearby river, lake or estuary are rising or starting to flood can show if a flood might happen, but be careful not to go into the water, as it may be deeper than you think.

## **B4.0 What to Do in the Event of a Flood?**

### **B4.1 A Flood is Coming! What do I do?**

If you think that a flood is coming, don't panic! Check *Your Family Flood Plan* (see Paragraph B3.2) to make sure you know what needs to be done.

The actions that can be undertaken immediately prior to a flood to reduce damages and keep you and your family safe are outlined below.

#### **Inside your House**

- Move valuables and other items to safety. Place them above the flood level or upstairs. (It may be preferable to routinely store such items safely upstairs or on high shelves).
- Roll up carpets and rugs and place them out of harm's way.
- Empty furniture that cannot be moved and put the contents upstairs.
- Raise furniture that cannot be moved elsewhere on bricks or blocks. Move these pieces away from walls to assist the drying later. If pieces are too difficult to lift weigh them down with a heavy object to prevent them floating and causing damage to windows, etc.
- Remove curtains if there is time, if not tie them over the curtain rail.
- Remove cabinet doors and internal doors if time allows, if not leave them open.
- Put sandbags at any openings where the water could gain access.
- Turn off gas and electricity.
- Disconnect cookers, washing machines, dishwashers, etc., connected by ridged pipes to prevent damaging the machine and the pipes.
- Store any electrical items upstairs or above flood level.
- Be prepared to evacuate your home or business. Protect yourself, your family and others that need your help.
- Have warm clothing and Wellingtons ready.
- Have medication to hand (if needed).



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- Check water/food stocks.
  - Co-operate with emergency services and local authorities. You may be evacuated to emergency centres.

### Outside your House

- Move your car to high ground if possible.
- Move any items kept outside such as garden furniture to higher ground. Remember that floodwater could get into your garage so move any chemicals or fuel to ensure that they do not spill into the floodwater and cause damage.
- Weigh down any manhole covers with sandbags or heavy objects. These could open during a flood and cause a hazard.
- Close off the flow valves on propane tanks, oil drums, or other fuel containers that supply your home through pipes and fittings.
- Unplug any exterior electrical connections such as outdoor lighting, pond pumps and filters.
- Turn off the water supply to the garden.
- Tie in climbing plants.
- Check tree ties are secure on any newly planted trees.
- Anchor fruit cages and coldframes against storm damage or dismantle them if time permits.
- Take valuable or sentimental items and store them indoors or move them to higher ground.
- Move treasured border plants to high beds, plant stands or heavy containers.
- Empty petrol lawn mowers.
- Lock gardening tools away.
- Use sandbags or floodboards on greenhouses and sheds.
- Harvest any crops that can be ripened indoors, such as tomatoes.

## B4.2 Safety First During a Flood

If a flood is occurring, and water is starting to come into your property, your safety should be your first concern. Remember that floods can kill! You should take heed of the following should you be caught in a flood.

- Don't try to walk or drive through floodwater - 150 mm (six inches) of fast flowing water can knock you over and 600mm (two feet) of water will float your car.
- Don't walk on sea defences, riverbanks or cross river bridges - they may collapse in extreme situations or you may be swept off by large waves.
- Take care when walking through shallow water - manhole covers may have come off and there may be other underwater hazards.
- Avoid contact with floodwater - it may be contaminated with sewage.
- Never try to swim through fast flowing water - you may get swept away or struck by an object in the water.
- Beware of flooding at dips in the roads, bridges and low spots - **turn back if the road is flooded.**
- Beware of stones being thrown up by waves - they may hit you, your car or your home.
- Try to keep calm, and to reassure others - especially children.

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## **B4.3 Contamination**

Floodwater will often be contaminated, usually by untreated sewage, spilled chemicals or dead animals.

- Always wear protective clothing when working in or near floodwater.
- Wash all cuts and cover them with waterproof plasters.
- If you receive a wound during a flood you should go to a doctor and get a tetanus injection.
- Small children, pregnant women, elderly people and those with mobility difficulties or other health problems should be kept away from floodwater.
- If you feel unwell at any stage or if you ingest floodwater you should contact a doctor.

## **B5.0 After Flooding**

### **B5.1 First Things First**

Do not re-occupy your house until it has been cleaned, disinfected and dried. You should also have any electric, gas or fuel based service checked by a professional before turning them on.

Floodwater can undermine the foundations of a property, weaken it structurally and move heavy items such as furniture into an unstable position.

**When entering a property after a flood, always take the following precautions:**

- Assume all power lines are live. Check that the power in the property is off before you do anything.
- Check for the smell of gas and make sure the lines are turned off.
- When entering a room look at the ceiling for any signs of cracks or bulges. Wet plaster is very heavy and can pose a threat to the structure of the property.
- If your basement is flooded do not rush to pump it out. If the ground outside is saturated it could create uneven pressure on the basement walls.
- Be careful when moving any debris and seek help in moving heavy or unstable items that could trap or crush you.
- Do not enter a building that has large amounts of sediment either inside or against it, as the structure may be unstable.
- Be careful when moving around inside the property, standing water can hide a lot of hazards.
- Move slowly and carefully when moving around a flooded building.
- Watch out for vermin or stray animals which may have taken shelter in your property during a flood. Be careful when approaching any animal and if you are worried call the local animal warden.
- Remember rats' urine can cause Weil's disease, so take care not to expose yourself to any water that you believe has been exposed to rats.
- Standing water can be a breeding place for micro-organisms which can be released into the air when the water is disturbed. These can be a health hazard if inhaled. Remove all items from the water as soon as possible and wear a protective mask if asthmatic or if you have chest problems.
- Remember that water can be contaminated – Wash your hands with disinfectant if they come into contact with floodwater or silt debris.
- Once you are satisfied that it is safe to enter your property there are a few things you must do before you start to clean.
- Record the damage caused by the flood on a camera or video recorder.

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- Mark the water levels on the walls for reference.
  - Check with your insurance company. They will usually pay for any clearing up, cleaning and sanitising following a flood. You may also be entitled to other assistance as well.
  - Always make sure your insurance company has given approval before any work is carried out.

## **B5.2 Starting Out**

Seeing the devastation a flood can cause to your property can be difficult for the whole family. Make sure that everyone gets plenty of support, rest and proper food. The clean up operation may seem like a daunting task, but just take things one step at a time.

- Make sure that the gas, electricity and any fuel taps are turned off.
- Temporary electricity can be hired, but ensure there is adequate ventilation as generators can produce carbon monoxide. Let the engine cool before re-fuelling.
- Make sure any appliances that use gas are disconnected.
- Make temporary repairs to the roof if it has been damaged. Tarpaulin makes a good temporary covering.

## **B5.3 Loss Assessing**

When you suffer a loss as a result of a flooding event, your immediate concern is to limit the damage to your property. Compiling and negotiating a claim, whatever its size, is not always as straight forward as you think.

- Examine your insurance cover
- Call your Insurance company
- You may want to call loss assessing experts to handle your claim on your behalf (There are a number of companies who specialise in loss adjusting)
- Call a reputable tradesman to make emergency repairs
- Write down everything that has happened, along with times and dates
- Collect all receipts for emergency work or other remedial repairs
- If your possessions have been damaged, take photographs - it is important evidence. It may not always be practical to keep them.

## **B5.4 Cleaning Up your House**

### **What you'll need**

Before you begin to clean up your property make sure you have the equipment you will need. This includes:

- A camera to record the flood damage.
- A basic tool kit with a hammer, nails, screwdriver and spanners.
- Brooms, mops, scrubbing brushes and buckets.
- Domestic detergent and disinfectant.
- Rubber boots, gloves and protective clothing.
- Shovels.
- Heaters, fans and a dehumidifier if available.
- Heavy duty refuse bags.

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**Remove standing water.**

- The fire service may supply a pump out service, for which there could be a fee, or you could hire a pump from a DIY store. Alternatively you can hire a specialist water damage company to pump the water out for you.
- Drain water away in stages to avoid problems with the water pressure on the structure of your property. Removing about one-third of the water per day is recommended.
- Do not heat your home to more than 4°C until all standing water is removed.

**Removing mud**

- Shovel out as much mud as possible and use a hose to clean out the rest.
- If there is mud on the inside and outside of your walls, remove in stages so that the loading remains even.
- A high-pressure hose should not be used to remove mud from your property.

**Cleaning and disinfecting**

- Scrub surfaces with hot soapy water and a heavy duty detergent. Do not forget the difficult-to-reach areas such as under kitchen units.
- Items such as soft furnishings, clothes and foodstuffs that have come into contact with floodwater should be placed in rubbish sacks (tied securely) and disposed.
- You will probably need to hire a skip to deal with all the refuse from your house. If you are making an insurance claim, do not throw anything out until you are told to do so by the insurance company.
- All food preparation surfaces need to be cleaned thoroughly and disinfected.
- Allow all cleaned surfaces to dry completely as there are germs that can thrive in wet conditions.

**B5.5 Drying Out**

Air circulation is the best way to dry out a property and also clears the air inside. Be patient and make sure the property is completely dry before you move back in.

**Some do's and don'ts**

- **Do** open your doors and windows to ventilate your home.
- **Do** ensure your house is secure (see below).
- **Do** unblock airbricks and vents.
- **Do** wash your hands with disinfectant if you came into contact with water directly.
- **Do** check external walls and the roof for structural damage before entering a property.
- **Don't** attempt to turn on any services until they have been checked by an expert.
- **Don't** eat any food that has come into contact with floodwater.
- **Don't** attempt to move any heavy or unstable objects by yourself, get help.

**Dry the property.**

- When drying out a building it is a good idea to start at the attic and work down, removing damaged or destroyed items and opening vents etc as you go.
- You can allow your property to dry naturally, but that can take months. Forcing the drying process can speed it up so that it only takes a number of weeks. Whatever way you choose to dry your property, make sure that the moisture trapped within the structure of the property is removed. Some times the walls may feel dry on the outside, but they are still damp internally. If in doubt get a professional in to ensure that your property is completely dry.
- In all cases, the earlier the drying process is started, the greater the chance of success will be – the first 48 hours after a flood are the most critical.



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- If your heating has been tested by a professional and is certified safe to use, it can be turned on to help dry the house. Keep the temperature at around 20 to 22°C. Excessive temperatures should be avoided as rapid heating may lead to cracking of plasterworks, etc.
  - Be aware that temperature alone will not dry your property. Air circulation and humidity are critical factors to consider.
  - Good ventilation is essential so keep windows and doors open during good weather and ajar during wet weather.
  - If you are using a dehumidifier leave external windows and doors closed especially during wet weather.

### **Don't forget security**

There have been instances of looting during the aftermath of a flood and while it is important to ventilate your house, it also pays to be security conscious.

- Remember that burglar alarms may have been affected by the water and might not work.
- Do not leave external windows and doors open when the property is unoccupied, and make sure that it is properly locked when you leave.
- If necessary cover any open or broken windows with security mesh.

## **B5.6 Repairs**

When choosing a builder or a restoration company, be sure to get a few quotes and always ask for references or confirmation of membership of trade bodies. Beware of door-to-door builders as they may not be qualified. Always make sure your insurance company has approved of any work to be undertaken.

### **Brickwork**

- Even after your property has dried out your brick work may still contain moisture. The best way to dry this is through natural evaporation. Open all the air vents to speed the process up.
- Keep an eye out for cracks in the walls as bricks can shrink or crack as they dry.
- Do not repaint brickwork until it is completely dry.
- You may notice a white salty growth on the walls. This will stop when the wall is fully dry and can be removed with a brush.
- If brickwork fails to dry have an expert check your property for rising damp.
- Covers on airbricks should be removed once the floodwater has receded.
- Do not light fires for at least two weeks after flooding in a brick fireplace. Steam will be created if the bricks are not dry and this can damage the chimney.

### **Floors**

- Remove floor coverings such as vinyl, carpet or tiles. Insulation materials that have become wet should also be removed, disposed of and replaced.
- Chipboard floors will be seriously damaged by floodwater and should be removed and replaced. If this is not possible, they must be strengthened with wooden struts from below.
- The spaces beneath concrete floors should dry out naturally and the floor will not be affected. If you think additional ventilation is needed you should contact a builder.
- If your property has suspended wooden floors, some boards should be lifted so that any water present can be removed. This can be achieved by draining through air bricks, using a pump or if necessary cutting holes in the perimeter walls of your property. Do not attempt to cut holes without professional advice.
- If floor joists show signs of rot have them replaced and treat the surrounding area to prevent spread.

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- Floors that are heaved or cracked should be replaced if they do not return to their original level. If they are at their original level, you can build another floor on top of them. If this is the case a vapour barrier should be installed between them.
  - The best way to test a floor for moisture is to use a meter. The safe moisture level for softwoods is 18%.

### **Glass and Windows**

- Clean all windows and oil locks and hinges to prevent corrosion.
- Single glazing is unlikely to be affected by floodwater, but check the condition of the putty, window locks etc, to ensure that the window is secure.
- Double glazed units should be inspected to ensure that floodwater has not eroded the edge seal. Check for mud and water trapped in the hollow of windows and door frames. If there is moisture inside the glass drill holes at the top and bottom of the frame to drain it out. If there is condensation between the frames the unit will have to be replaced.
- Sash windows may distort and swell following a flood. Do not force them open as this can cause further damage. The swelling should reduce during the drying period. If it does not return to its normal size when the wood is completely dry, then it can be planed to fit the frame.
- If sash windows have to be opened to assist with drying the property then remove the beading and the opening sash. Temporary beading can be screwed into position for added security when the property is unoccupied.

### **Insulation**

- Insulation that has become wet must be removed and replaced as it loses its effectiveness and inhibits the drying process.
- Fibreglass insulation is an irritant. If removing, wear protective clothing.
- If you think that wall cavity insulation has been damaged by flooding seek expert advice before trying to remove it.

### **Interior Decoration**

- Low permeability wall coverings like vinyl wallpapers, gloss paint and tiling will hamper the drying process. Remove the wall coverings from at least one side of the internal walls to help speed up the drying process.
- Timber stud partitions may rot if not dried properly.
- Do not redecorate for at least 3 months after the walls have dried and any repairs have been done. Painting or wall papering too soon can result in blistering, mould or peeling.
- Staining may occur when re-painting with emulsion. This can be avoided by using an oil-based or stain-block paint before applying emulsion.
- If your kitchen units are made of chipboard they will be severely damaged by flooding. It may expand, distort and lose their strength. They are impossible to disinfect properly and should be discarded. Consider replacing them with solid wood or plastic, especially if there is a risk of future floods.

### **Plaster and Dry Linings**

- Gypsum-based plaster absorbs large amounts of water and will distort in a flood. Damaged plasterwork needs to be replaced, but wait until you are sure that crack movement and salt deposition have ceased.
- When you are re-plastering consider using tanking instead, as this is more resilient to floodwater.
- Where there is plasterboard, remove skirting boards. Then cut or drill holes through the plasterboards or dry linings to drain trapped water and aid ventilation.
- It is vital to ensure that the walls are thoroughly dry internally before beginning any redecoration.

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## Structural Damage

- Structural damage may not necessarily be evident for some time after the flood. Make regular checks on your property and check for these tell-tale signs:
- Changes in the line or appearance of a roof ridge (best observed from a distance).
- Buckling of walls, identified by horizontal cracking or areas that appear to have moved out of vertical alignment.
- Vertical or diagonal cracks which indicate that walls or footings have settled.
- Bulging or dislodged sections of property.
- Deep scouring which has led to exposed foundations.
- Any new cracks bigger than 5mm above windows or doors.
- If you notice any of these signs, contact your insurance company immediately and get the advice of a structural engineer or surveyor.

## Walls

- Traditional brick or concrete walls will generally dry out well. Ensure bricks are clear for ventilation and hose down and scrub external walls
- You may notice a white salty growth on the walls. This will stop when the wall is fully dry and can be removed with a brush.
- If you wish to speed up the drying process, consult a professional builder about locating vents at about one metre intervals all around the property at damp proof course level and also at the top of cavities behind masonry cladding.
- Seek professional advice if the walls of your property have had moisture sealants applied to them as this could hamper the drying process.
- Remove any substantial sediment or debris piled against the walls as this will exert a force upon the walls and should be removed in careful stages. If the loading is both on the inside and outside of a wall, seek to maintain levels evenly as you remove them.
- Have wall cavities inspected by an expert to ensure that the walls are secure, if wall tiles are corroded get an expert to replace them.

## Wood

- If wood can be dried within a few weeks then decay is unlikely.
- Wood framed walls need to be fully exposed unless the flooding only lasted a few hours. In order to do this plasterboard, vapour control membranes and insulation should be removed up to the highest level of the flood water.
- Wooden window frames may swell and jam when wet. Have an expert check whether rot is present. Wet timber can be treated with preservative plugs. Once dry, the frames can be redecorated.
- Wooden staircases may have become unstable and weak. Check the support of the staircase and, if required, strengthen it with extra struts. Stabilise loose threads once the staircase has dried out.
- Fire doors are often constructed with layers of fire resistant compound packed in their cores. Floodwater can permanently damage these, so the doors should always be replaced.
- Wooden trim and door framing attached to the wall may deteriorate during prolonged drying periods.
- If there is more than 18% moisture present in softwood, fungal growth can begin.

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## **B5.7 Restoration of Services**

You must have an expert check your property's services before you turn them back on. The damage caused by the flood may not be obvious and switching on a service could be very dangerous.

### **Electricity**

- An electrician will check the junction boxes, socket outlets, light switches and ceiling connections to ensure that there is no water trapped inside them.
- Modern wiring can withstand a short period of flooding, but if your property was flooded for more than a couple of hours then you need to replace the wiring in your house. Consider re-routing cables to drop down from above.

### **Gas**

- Water and mud may enter gas systems during a flood. A registered engineer can check all your appliances, as these may be dangerous, even if they appear to be working normally.

### **Water**

- Mains supply water should not be affected by flooding, but wash the taps and then run them for a short time to ensure that silt has not entered the system.
- If you suspect that your mains supply has been contaminated contact your local authority and boil tap water for at least 20 minutes before use.
- Check the pipe work in your house to ensure that it has not been damaged and check any insulation around the pipes and replace as necessary.
- Water supplies that are not on the mains system, such as cisterns or wells, may be contaminated and should not be used until they have been tested over a period of time. Consult a specialist for advice.

### **Sewers**

- Drains and sewers are rarely damaged by floods, but they may block and back up. Check this by flushing toilets and running taps. Report any blockages to the local authority.
- If sewer repairs need to be made, consider installing anti-backflow devices.
- If you have a private sewage system, make sure that there is no damage that could result in a health hazard. Saturated soils may interfere with its proper function. Do not use until the flood water level has subsided.
- Service damaged tanks etc and have them inspected as soon as possible by a professional.
- If flooding is likely to occur, make sure that the septic tank is kept full. In the event of a severe flood an empty tank could float away

## **B5.8 In the Garden**

### **Soil and Borders**

- Sodden soil can lead to shallow rooting, making plants unstable and prone to drought in dry spells. Wait until the soil dries out and then do some deep digging (turn over the soil to the depth of your spade) to prevent this problem.
- In the case of seawater flooding, the only thing you can do is lift precious plants, wash off the soil and replant them in containers.

### **Ponds**

- Most aquatic life can normally cope with freshwater flooding, but seawater will probably cause fatalities. The best way to preserve your pond is to tie netting over it to prevent fish and aquatic plants from being swept away.



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## **Plants**

- Most garden plants will survive a few days' immersion in water, but the roots will need oxygen. Fork the plants out of the soil, wash off the silt and debris from the roots and foliage and heel them in a drier part of the garden or a pot.
- Trim back any browning or dead leaves, stems or branches.
- Add slow release fertilizer to the soil to replace lost nutrients.
- Raise plants in containers onto bricks to help them drain.

## **Lawns**

- Do not walk on a waterlogged lawn, wait until it is dry and gently aerate the top soil with a fork to about 130 mm.
- Work some coarse lime free sand into the holes and reseed any bald patches.

## **Vegetables**

- Throw away any crops that have been covered by floodwater and let weeds germinate to help dry out the soil before replanting.

# **B6.0 Flooding and Farming**

## **B6.1 Preparing for Floods**

If you have a livestock farm, you will need to think not only about your family and house, but also your livestock. Make a flood plan to protect your property, your facilities, and your animals.

### **Issues you might think about when creating the plan for your livestock might include:**

- Create a list of emergency telephone numbers, including those of your employees, neighbours, veterinarian, state veterinarian, poison control, local animal shelter, animal care and control, local Teagasc office, trailering resources.
- Include a contact person outside the farm. Make sure all this information is written down and that everyone in your family has a copy.
- Make sure every animal has durable and visible identification.
- Ensure that poultry have access to high areas in which to perch, if they are in a flood-prone area, as well as to food and clean water.
- Perform regular safety checks on all utilities, buildings, and facilities on your farm.
- Remove all barbed wire, and consider rerouting permanent fencing so that animals may move to high ground in a flood.
- Install a hand pump and obtain enough large containers to water your animals for at least a week (municipal water supplies and wells are often contaminated during a flood).
- Identify alternative water and power sources. A generator with a safely stored supply of fuel may be essential, especially if you have electrical equipment necessary to the well being of your animals.
- Secure or remove anything that could be floated and move about; make a habit of securing trailers, propane tanks, and other large objects. If you have boats, feed troughs, or other large containers, fill them with water. This prevents them from floating away and also gives you an additional supply of water.
- If you use heat lamps or other electrical machinery, make sure the wiring is safe and that any heat source is clear of flammable debris.

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- Label hazardous materials and place them all in the same safe area. Provide local fire and rescue and emergency management authorities with information about the location of any hazardous materials on your property.

## **B6.2 What to Do in the Event of a Flood**

- Move machinery, feed, grain, pesticides and herbicides to a higher elevation. If you have a two-storey barn, the upper level makes a good temporary storage facility.
- Open gates so livestock can escape high water.
- If water is rising, try to drive stock through water free of obstructions. Grazing animals swim well, but the greatest problem for them are fences and other obstacles. Long swims through calm water are safer than short swims through a swift current.
- Leave building doors and windows open at least 50 mm (2 inches) to equalize pressure and help prevent buildings from shifting.
- If possible, move motors and portable electric equipment to a dry location.
- Tie down lumber, logs, irrigation pipes, fuel tanks and other loose equipment or material. Secondary containment is another possibility for fuel tanks, as well as pesticide storage.
- To keep surface water out of your well, use materials such as heavy plastic and duct tape to seal the well cap and top of the well casing.

## **B6.3 What to Do After a Flood**

If your property has been affected by the flood water you will want to get things back to normal as soon as possible. Here is some advice on protecting yourself and speeding up the recovery process.

### **Cleaning and Drying Out Your Property**

- Contact the Fire Brigade if your property requires pumping out. While the water is rising, your property will not be pumped out.
- Contact the Utility Companies to check the supply is safe. With regard to electricity, assume that cables are live and switch off at the mains. Contact an approved contractor for further advice.
- If you smell gas on re-entering your property contact the gas company immediately.

### **Dead Animals**

- Dead farm animals should be disposed of by the farmer in accordance with normal practice.
- Dead animals on the highway or on public land should be reported to the local authorities.

### **How to Protect Yourself**

- Avoid direct contact with sediment, sludge and debris.
- Wear waterproof hardwearing protective gloves and sturdy footwear.
- Before starting work, cover all cuts and existing wounds, however small, with a sterile waterproof dressing. Any new injuries or cuts should be washed in clean running water immediately and the wound covered with a sterile waterproof dressing.
- Cover long hair to avoid contact with contaminated sediment.
- Do not eat, drink or smoke whilst cleaning out and avoid touching your face unless you have washed your hands and face thoroughly with soap and clean water. Dry with a clean towel.
- Only drink from clean containers.
- If you become wet or cold, get clean, dry and warm as soon as possible. Have a hot drink before you start work again.
- Wash all gloves, tools and clothing thoroughly after use.

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- Consult your doctor in the event of flu-like illness or fever, particularly where associated with severe headache and skin problems.
  - More tips on cleaning up after a flood can be found in the *After Flooding* Section of this Appendix (see Paragraph B5.0).

## **B6.4 Rights & Responsibilities of Riparian Landowners**

If you live near a water source such as a river or a stream, you have rights and responsibilities in relation to the water source and flooding. Some of these are outlined below.

- You may own land up to the middle of the watercourse. This depends on what your title deeds show.
- You have the right to protect your property from flooding and erosion by carrying out works to your land. You may need to obtain planning permission before any work can be commenced.
- You have the responsibility to pass on flow without obstructing or polluting the water otherwise affecting the rights of the owners downstream.
- This may include a responsibility to maintain the bed of the watercourse by clearing any debris if failure to do so could cause damage to downstream owners.
- You may have flood defences such as walls and embankments on your property, which are vital for the protection of both yourself and others.

The above is for general information only. Specific legal advice should always be sought on the application of the law in any particular situation. You should not act or refrain from acting on the basis of any material contained on or in this website without seeking appropriate legal or other professional advice.

## **B7.0 Flooding and Business**

### **B7.1 Preparing for Floods**

Look at your existing business policies, and think about whether they are appropriate in the event of a flood. You might want to adapt your procedures to prepare for flooding. Make sure that all staff know what to do in case of a flood.

#### **Security Procedures**

- Security procedures - Locking windows, doors and setting the alarm. You might need more than one person to help do this.
- Insurance policies - Are you insured for flood damage, business interruption and lost revenue?
- Employee manuals - You might add flood safety to staff information packs, or adapt job descriptions to include flood warden duties.
- Hazardous materials plan - You must ensure that chemicals, oils and other substances in your possession are kept safe and do not contaminate flood water.
- Health and safety assessment - Plan to check functioning of flood products and flood warning systems regularly, just as you do for fire safety equipment.

#### **Important Contacts**

- Make a list of important telephone numbers, including contacts for gas, electricity, water and telephone providers.

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## **Staff**

- Make a list of employees' contact details in the event of an evacuation. This might include mobile telephone numbers, or numbers for their home or the home of a friend or relative.
- Think about staff who may need special assistance in the event of a flood (e.g. elderly, deaf, blind etc.)

## **Key Locations**

- Know the location of cut-off points for gas, electricity and water. Ideally, these should be marked on a map that is stored with your flood plan.
- Know the location of chemicals, oils or other materials that could be dangerous or contaminate flood water. These should be stored safe from floods and other damage.

## **Protective Actions**

- Note key stock, equipment and possessions that may need special protection from flood waters.
- Consider things you may need during or after a flood (i.e. sandbags, plastic sheeting, loudspeaker etc.)
- See if it's possible to move key operations, such as shipping and receiving or customer services, to another building.

## **Suppliers and External Links**

- Identify products and services you won't need in the event of a flood, or which suppliers may not be able to provide. Make back-up plans or arrangements for short-notice cancellation of deliveries.
- Consider contracting in advance with companies whose help you may need after a flood. This avoids the frustration of finding help in an emergency, and puts you in a better position to negotiate costs.
- Identify people who can help you before, during and after a flood.

## **B7.2 What to Do in the Event of a Flood**

### **During a Flood**

- Avoid driving or walking through flood water – these are the main causes of death during floods. Flood water may be deeper or faster flowing than you think and contain hidden snags and debris. Crossing flooded bridges is dangerous and should not be attempted
- Keep listening to a local radio station for further information and advice
- Keep in contact with neighbouring business premises
- Be prepared to evacuate if advised
- Turn off the electricity, gas and water as you leave

### **When you Evacuate**

- Be ready to leave quickly after being advised of likely flooding. You must leave well before roads to high ground are closed by flood water. If you remain you risk being trapped in fast-flowing, debris laden water.

## **B7.3 What to Do after a Flood**

Cleaning up a flood-ravaged business can be a difficult and disheartening task. It can also be dangerous. Before you can even enter your property to assess the damage and begin clean-up and repair, you must take steps to protect the health of workers and volunteers who have come to help.

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**Before entering a flood-damaged building**

- Remember that buildings that have been submerged or have withstood rushing flood waters may have suffered structural damage and could be dangerous.
- Check for structural damage before entering a building. Don't go in if there is any chance that the building, or parts of it, may collapse. If you see damage, have a qualified person check the building before you enter.
- Never assume that water-damaged structures or ground are stable.
- Assume that all stairs, floors, roofs, and overhangs are unsafe until they are inspected.

**When you enter a flood-damaged building**

- Once you are certain that the building is safe to enter, make sure the electricity is turned off at the meter or at the street before you enter. Determine that all electrical hazards are controlled.
- Enter the building carefully. Leave immediately if shifting or unusual noises signal a possible collapse.
- If the door sticks at the top, that could mean your ceiling is ready to fall. If you force the door open, wait outside the doorway in case debris falls.
- Check the ceiling for signs of sagging. Wind, rain, or deep flooding may wet plaster or wallboard. It is very heavy, and will be dangerous if it falls.
- If you suspect a gas leak or smell gas, or if you hear blowing or hissing, open a window and leave the building and premises immediately. Call the gas company from a different location. Do not re-enter the building.
- Be aware of the possibility of electrical shock and the possibility of injuries caused by hidden sharp objects.
- Turn off the power at the main breaker or fuse on the service panel (if you can reach these without stepping in water); otherwise, have your utility company disconnect the power at the meter. Take this important step even if the power is off in your community.
- Do not turn the power back on until electrical equipment has been inspected by a qualified electrician.
- Shut off the water.
- Never touch electrical equipment if the ground is wet, unless you are absolutely certain that the power is off.

**Be cautious about hazardous materials**

- Flood waters can dislodge tanks, drums, pipes, and equipment, which may contain hazardous materials such as pesticides, chemicals, or fuels.
- Do not attempt to move unidentified dislodged containers without first contacting the local fire department or hazardous materials team.
- If you are working in potentially contaminated areas, wear appropriate protective clothing and respirators.
- Thoroughly wash all clothing and parts of your body that may have come in contact with sewage or other contaminants or with hazardous substances or chemicals. Use soap and clean water. Use waterless sanitizers if uncontaminated water is not available.

**Be cautious about contaminated floodwaters**

- Floodwaters are often contaminated with biohazards (sewage, medical waste, animal waste and carcasses) or other hazardous materials (fuels, asbestos, farm chemicals, etc.). Flood-damaged buildings may also have damp areas where moulds, mildews, and other organisms thrive.
- Assume that anything touched by floodwater is contaminated.
- Use appropriate personal protective equipment, including goggles, respirators, gloves, etc., if you must come in contact with flood waters.
- Make sure that all workers have up-to-date tetanus shots.



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## **Secure the Property**

- Post security guards to monitor your property and facilities, since alarm systems may not be functioning, and since buildings may have to be left open during salvage and restoration.
- Provide guards with names of staff or contractors who have permission to be at the site.

## **Document the damage**

- Once it is safe to enter the building, make a preliminary tour of all affected areas. Wear protective clothing.
- Do not move equipment or other objects without documenting their location and condition.
- Use a camera or video camera to record conditions of structure, equipment, and furnishings. Make sure images clearly record the damage. Supplement these with better quality photos when necessary.
- Make notes and voice recordings to accompany the photographs.
- Assign staff to keep written records of contacts with insurance agents and other investigators, staff decisions on retrieval and salvage, and costs associated with clean-up and salvage.
- Make visual, written, and voice records for each step of salvage procedures.

## **Cleaning up after a flood**

- Tips for cleaning up after a flood can be found in the *After Flooding* Section of this Appendix (see Paragraph B5.0).

## **B7.4 In the Event of an Insurance Loss**

### **Loss Assessing**

When you suffer a loss your immediate concern is to limit the damage to your business and get back to full trading as quickly as possible.

Compiling and negotiating a claim, whatever its size, is not as straightforward as you think.

You may want the services of a loss assessor to handle your claim on your behalf, so you can concentrate on your business. They have the ability to;

- Examine your insurance cover
- Assess the damages to the property and its affect on business
- Negotiate interim payments with Insurers if necessary
- Quantify the loss and present the statement of claim to your Insurers
- Negotiate speedy settlement of your claim

## **B8.0 Who can Help?**

### **B8.1 There are a number of different organisations that can help in a flood**

Below is a list of a number of different organisations that can help in a flood. Keep these numbers handy so that you can get them easily in an emergency. *Although every effort is made to ensure the reliability of listed sites, this cannot be taken as an endorsement of these sites.*

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**Useful contact numbers:****Emergency numbers**

999 or 112

Ask for the emergency service you require:

- Ambulance
- Gardaí
- Fire Brigade
- Lifeboat
- Mountain/Coastal rescue
- Irish Coast Guard
- Other

Give the address or location where help is required. Be as precise as possible.

**Westmeath County Council** 044 93 32000 <http://www.westmeathcoco.ie>**Athlone Town Council** 090 64 42100 <http://www.westmeathcoco.ie>**Health Service Executive** 1800 520 520**Electricity** 1850 372 999**Gas** 1850 20 50 50**Telephone** Eircom : 1901  
EsatBT : 1800 924 924**Structural Engineer/Surveyor** Association of Consulting Engineers of Ireland – 01 642 5588  
(see below)**Department of Social Protection** 1890 50 00 00**Department of Environment, Community and Local Government** 01 888 2000**Office of Public Works** Email: [info@opw.ie](mailto:info@opw.ie)**Met Eireann** [www.met.ie](http://www.met.ie)**National Flood Hazard Mapping** [www.floodmaps.ie](http://www.floodmaps.ie)**Association of Consulting Engineers of Ireland (ACEI)** - For advice on structural surveys. For a directory of ACEI structural Engineers see website - [www.acei.ie](http://www.acei.ie)**Citizens Information Board**, Hume House, Ballsbridge, Dublin 4 (Agency responsible for the provision of information on public services and entitlements in Ireland) 01-605 9000 or <http://www.citizensinformation.ie>

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## **B8.2 Insurance**

When claiming for flood damage on your insurance remember the do's and don'ts below:

**Do** telephone your insurance company's 24 hour emergency helpline to get the process started as soon as possible.

**Do** commission immediate emergency pumping and repair work to protect your property from further damage.

**Do** get advice from your insurance company on reputable contractors and builders.

**Do** check with your insurer if you have to move into alternative accommodation, as this is often covered by your policy.

**Do** make sure your insurance company knows where to contact you if you have to move out of your home.

**Do** keep an inventory of all your correspondence with your insurance company.

**Don't** begin any work without the approval of your insurance company.