TORBAY COUNCIL

Flood Investigation Report

6th October 2012

Introduction

Under the Flood and Water Management Act 2010 (FWMA), Torbay Council as a Unitary Authority were designated as the Lead Local Flood Authority (LLFA) for Torbay. This has placed a number of statutory responsibilities on the Council in relation to flood risk management. One of these new responsibilities is identified under Section 19 of the Act which states:

Section 19 – Local Authorities: Investigations

1) On becoming aware of a flood in its area, a Lead Local Flood Authority must, to the extent that it considers it necessary or appropriate, investigate –
    a) Which Risk Management Authorities have relevant flood risk management functions, and
    b) Whether each of those Risk Management Authorities has exercised, or is proposing to exercise, those functions in response to the flood.
2) Where an authority carries out an investigation under subsection (1) it must –
    a) Publish the results of its investigations, and
    b) Notify any relevant Risk Management Authorities

Under the Act a Risk Management Authority is identified as:

1) The Environment Agency
2) A Lead Local Flood Authority
3) A district council for an area for which there is no unitary authority
4) An internal drainage board
5) A water company
6) A highway authority

When considering whether it is necessary or appropriate to investigate a flooding event Torbay Council will assess the severity of the event and the number of properties affected. The Local Flood Risk Management Strategy which is currently being prepared by Torbay Council will identify the criteria to be used when considering whether a Flood Investigation Report is required. Until this Strategy is published, Torbay Council will undertake a Section 19 flood investigation following a flooding event where 5 properties or more suffer internal flooding.

In partnership with the other Risk Management Authorities in Torbay this report has been produced to comply with the legislation and to determine the main causes of the flooding. In addition, within this report Torbay Council have identified a number of actions the relevant Risk Management Authorities need to consider. Torbay Council as the LLFA will continue to monitor the list of actions with all the relevant Risk Management Authorities and will assist in the delivery where practical to do so.

Risk Management Authority Responsibilities

Recording Flooding Incidents and Key Responsibilities

As part of the new statutory duties identified within the FWMA 2010 all LLFAs must record flooding incidents within it's area.

The roles and responsibilities for the various types of flooding is spread across all of the Risk Management Authorities identified within the FWMA 2010 with the LLFA having an overriding duty to investigate, where appropriate, the flooding from all sources. The following table identifies the relevant flood risk management functions for each of the Risk Management Authorities and the different sources of flood risk that Torbay Council as LLFA need to investigate.

Flood Source	Lead Local Flood Authority	Environment Agency	Water Company	Highway Authority
Rivers:				
Main Rivers		Responsible		
Ordinary watercourses	Responsible			
Surface Run Off:				
Surface water	Responsible			
Surface water on the highway				Responsible
Other:				
Sewer Flooding			Responsible	
Coastal Flooding		Responsible		
Groundwater	Responsible			
Reservoirs		Responsible		

It should be noted that a main river in the above table refers to a river that has been designated as such by the Environment Agency. These tend to be the larger arterial watercourses that are considered to pose a significant flood risk. Ordinary watercourses include all rivers and streams that have not been designated as main rivers and all ditches, drains, culverts, dikes, sluices, sewers (other than public sewers) and passages through which water flows.

The general Risk Management Authority responsibilities in relation to flood risk and surface water management are outlined below:

The Environment Agency is responsible for managing the risk from the sea, main rivers and reservoirs and they have a strategic overview role for all flood risk management. The Environment Agency also provides a flood warning service throughout England and Wales in areas at risk of flooding from rivers or the sea.

Torbay Council as Lead Local Flood Authority is responsible for overseeing the flood risk from ordinary watercourses, groundwater and surface water run-off. They are also responsible for consenting works on ordinary watercourses and enforcing the removal of any unlawful structures or obstructions within the watercourse. As previously identified they must ensure that following a flooding event a flood investigation is carried out and the flood investigation report is published.

Torbay Council as Highway Authority is responsible for surface water on the highway and maintaining gullies and culverts to ensure effective highway drainage.

In addition to the Risk Management Authority responsibilities identified above land/property owners that have a main river or ordinary watercourse in or adjacent to their land have riparian responsibilities on that main river or ordinary watercourse. This means that the landowner must:

- Let water flow through their land without any obstruction, pollution or diversion which affects the rights of others.
- Accept flood flows through their land, even if these are caused by inadequate capacity downstream.
- Keep the banks clear of anything that could cause an obstruction and increase flood risk, either on their land or downstream if it is washed away.
- Maintain the bed and banks of the watercourse and the trees and shrubs growing on the banks and should also clear any litter or debris from the channel and banks, even if it did not come from their land.
- Keeps any structures, such as culverts, trash screens, weirs and mill gates, clear of debris.

Background

Torbay suffered a period of prolonged rainfall from the evening of 4th October 2012 until the morning of 6th October 2012, some of which was torrential and affected all parts of the bay to varying degrees. The most severe rainfall was experienced across the bay during the early hours of 6th October 2012.

Raingauges owned by Torbay Council and the Environment Agency have been downloaded in Brixham (Laywell Reservoir) and Torquay (Torre Abbey). The total rainfall recorded between the 4th and 6th October 2012 at these raingauges was 65.0mm in Brixham and 66.6 mm in Torquay. As mentioned earlier the most severe rainfall was experienced in the early hours of 6th October 2012 and the peak intensity at each location was 23.2mm/hr in Brixham and 16.8mm/hr in Torquay.

The total rainfall that fell on each day during the storm event is as follows:

Date	Torquay	Brixham
4th October 2012	13.2 mm	12.0 mm
5th October 2012	22.0 mm	18.2 mm
6th October 2012	31.4 mm	34.8 mm
Total Rainfall	66.6 mm	65.0 mm

The rainfall characteristics of the storm event have been analysed and the return period has been calculated. In Torquay the return period between 13:30 hrs on 5th October 2012 and 04:00 hrs on 6th October 2012 has been assessed as 1 in 7.5 years. In Brixham the return period between 20:15 hrs on 4th October 2012 and 04:45 hrs on 6th October 2012 has been assessed as 1 in 5.8 years.

At approximately 02:00 hrs on 6th October 2012 Torbay Council's 24 hour control room received their first call regarding flooding from a property in Dartmouth Road in Paignton. Further calls were received throughout the morning and early afternoon. Highways, drainage and TOR2 staff were successively called out during this period. Their work involved putting in place diversion arrangements for flooded roads, installing warning signs, sandbagging locations to prevent flooding from the highway, replacing blown manhole covers, clearing blocked road gullies, clearing trash screens and generally cleaning up after the flooding had subsided.

In addition to the calls received by Torbay's control room the Devon and Somerset Fire & Rescue Service control room and South West Water's call centre received numerous telephone calls regarding flooding. Devon and Somerset Fire & Rescue attended flooded properties to assist with pumping out in Dartmouth Road and Station Lane in Paignton, Fleet Street in Torquay and St Mary's Hill in Brixham.

Incident Reports

A detailed analysis of the reported incidents to Torbay Council's control room, Devon and Somerset Fire & Rescue control room, South West Waters call centre and those received directly by Torbay Council's Engineering and Highways sections has been undertaken. It should be noted that additional properties are likely to have been flooded however property owners have not reported them.

There were over 30 properties throughout the bay reported as suffering internal or external flooding during the storm event.

These incidents have been further analysed to diagnose whether the flooding was caused due to surcharge of the public sewer system, inadequate highway drainage, surface water run-off, groundwater or flooding from main rivers or watercourses.

Key Problem Areas

Dartmouth Road/Station Lane, Paignton

This area of Paignton has a history of flooding incidents from the combined sewer system and the surface water drainage system. In 2007 Torbay Council constructed, as part of a flood alleviation scheme, a new pumping station at Paignton Green to allow the surface water drainage in the low lying areas of Paignton including Dartmouth Road/Station Lane to discharge against all tidal conditions. This scheme was designed to prevent flood alleviation for a 1 in 75 year storm event. Since the completion of the scheme there have been no reported flooding incidents from the surface water system.

On 6th October 2012 a total of 7 number basement flats in Station Lane/Dartmouth Road reported internal flooding. A detailed investigation into the flooding has been undertaken by Torbay Council and South West Water. The results of these investigations has identified that 5 of the properties were flooded due to overloading/surcharging of the combined sewer system, 1 property suffered flooding due to groundwater entering the building.

The combined sewer system in the Dartmouth Road/Station Lane area drains to a pumping station located in Station Lane. South West Water have confirmed that the pumping station was overloaded during the storm event and the top water level within the pumping station would have resulted in the basement properties in Station Lane/Dartmouth Road being flooded.

Actions

South West Water	Investigate operation of pumping station to ensure that capacity of pumps is sufficient to reduce the risk of flooding in accordance with Ofwat requirements. If pump capacity inadequate investigate scheme to increase capacity of pumps.
Property Owners	Undertake regular maintenance of their private drainage system including pumps and non return valves where fitted in order to reduce the risk of flooding.
Torbay Council/Property Owners	Where groundwater flooding has occurred Torbay Council to advise property owners of their responsibilities to protect their own property from groundwater. Torbay council can advise the property owners on how this could be undertaken.
Property Owners	Consider flood risk to own property and consider installing property level protection where necessary.

Totnes Road/Saxon Meadow, Paignton

The Yalberton Watercourse, classified as a main river flows through Collaton St Mary. The majority of the watercourse is open, however as it passes under Totnes Road it is culverted. As part of the development at Collaton St Mary School immediately upstream of the culvert under Totnes Road, the school playing field was designed as a flood storage area in order to reduce the risk of flooding in Saxon Meadow and Totnes Road. In addition to the watercourse, this area is served by a combined sewer system which at times of heavy rainfall is known to surcharge. There is a history of both the combined sewer system and the watercourse flooding in this area of Collaton St Mary.

During the storm event of 6th October 2012, six properties suffered external flooding in this area. Following reports of the flooding Torbay Council's Engineering section undertook a detailed investigation into the flooding incident. The result of this flooding incident revealed that the Yalberton watercourse flooded in the early hours of the morning causing floodwater to flow across Totnes Road and flooding the access road in front of numbers 391 to 399 Totnes Road, together with the gardens in Saxon Meadow. In addition to the Yalberton Watercourse flooding, problems were experienced with a ditch in a field to the rear of Totnes Road where a private trash screen at the head of a culvert had become blinded. This ditch is the responsibility of the riparian owner who is Torbay Coast and Countryside Trust.

Finally a resident in Totnes Road reported that the manhole covers in both Totnes Road and the access road in front of 391 to 399 Totnes Road had surcharged causing sewage to escape and enter the floodwater from the watercourse. A number of residents also reported that the foul sewage was backing up their private drainage system, with levels in their ground floor toilets rising however the levels in the toilets did not rise sufficiently for internal flooding to occur.

Residents in this area were concerned about the effects that proposed future development in the Collaton St Mary area could have on the flood risk.

Actions

Environment Agency/Torbay Council	Investigations should be undertaken into the condition of the culvert under Totnes Road together with investigating the possibility of a flood alleviation scheme being provided. Following initial investigations, if a scheme is feasible Torbay Council should include a future flood alleviation scheme for this area on the Environment Agency's Medium Term Financial Plan.
Riparian Land Owners	Undertake regular maintenance/cleaning to ensure that watercourses/main rivers are not restricted or blocked. If this is not done Torbay Council or the Environment Agency to consider carrying out enforcement if necessary.

South West Water	Investigate the condition and capacity of the combined sewer in the Collaton St Mary area in order to identify any repairs or improvement works that are necessary to ensure reduced flood risk in this area.
Torbay Council/Environment Agency/South West Water	To ensure flood risk is managed from proposed new developments in this area, encourage the use of sustainable drainage systems for all new developments.
Property Owners	Consider flood risk to own properties and investigate possibility of installing property level protection where necessary.

Fleet Street, Torquay

Within Torquay town centre there is a history of flooding from the combined sewer system, surface water run-off and groundwater. Prior to the early 1990's flooding occurred on average annually however following the construction of three attenuation tanks upstream of the town centre this area has been protected for storm events having a return period of up to 1 in 25 years.

Following the report of 4 properties suffering basement flooding in Fleet Street investigations where undertaken by Torbay Council's Engineering section. As part of these investigations the telemetry data for the attenuation tanks and the combined sewer system has been checked. This revealed that the attenuation tanks were operating as designed and all had spare capacity during the storm event. Checks were made on the water levels in the combined sewer in Fleet Street and although surcharge had occurred the top water level during the storm event was well below ground level.

Site inspections of the properties that suffered flooding identified that the flood water had entered the basements through the fabric of the building. In fact in two of these basements groundwater pumps are evident. Based on these investigations, the cause of the flooding to these properties was diagnosed as groundwater.

Actions

Torbay Council/Property Owners	As it is the responsibility of the property owner to protect themselves against groundwater flooding Torbay Council have advised the property owners of their responsibilities.
Property Owners	Where properties have flood protection measures in place they should undertake regular maintenance of their protection measures including pumps, non return valves, flood boards, etc. in order to reduce the risk of future flooding.
Property Owners	Where properties do not already have flood protection measures in place they should consider the flood risk to their own property and consider installing property level protection where necessary.

St Mary's Hill, Brixham

There are no records of historic flooding in this area of Brixham. Reports of internal flooding were received during the storm event on 6th October 2012 from four properties in the St Mary's Hill area. These properties are owned and managed by the Devon and Cornwall Housing Trust and investigations were undertaken jointly by the Housing Trust and Torbay Council.

These investigations identified that recent works had been undertaken by the Housing Trust at the properties including the installation of a new drainage system incorporating soakaways. Further investigations identified that the design of the new drainage system was inadequate to cater for a storm event of the nature and magnitude that occurred on 6th October 2012 and hence flooding to the properties was inevitable.

As a result the Devon and Cornwall Housing Trust are now undertaking works to the drainage system in order to reduce the risk of further flooding.

Actions

Devon and Cornwall Housing Trust	Undertake revised design for the drainage system and undertake improvement works to the drainage system in order to reduce the risk of further flooding events occurring in the future.

Isolated Flooding Locations

In addition to the four flooding locations identified previously within this report there were a number of other flooding incidents during the storm event throughout Torbay. All of these incidents have been investigated, the responsible Risk Management Authority has been identified and future actions to reduce the risk of flooding have been discussed with the relevant authorities.

The location, reasons for flooding and responsible Risk Management Authority for the flooding incidents are identified in the following tables.

Torquay

Location	Type of Flooding	Risk Management Authority
Teignmouth Road/Hele Road	External flooding to school playing field and highway from combined sewer system	South West Water
Chestnut Avenue/Walnut Road/Avenue Road	External flooding to highway due to blocked road gullies and hydraulic overload of watercourse	Torbay Council
Babbacombe Road	External flooding to highway due to blocked road gullies	Torbay Council Highways
Lymington Road	External flooding to highway due to blocked road gullies	Torbay Council Highways
Lower Shirburn Road	Internal flooding to basement due to blocked road gully	Torbay Council Highways
Barton Hill Road	External flooding to highway due to hydraulic overload of combined sewer	South West Water
Vauxhall Road/Parkhill Road	External flooding to footpath due to hydraulic overload of combined sewer system	South West Water

Paignton

Location	Type of Flooding	Risk Management Authority
Manor Court	External flooding to property from hydraulic overload of main river	Environment Agency/Torbay Council
Esplanade Road	Internal flooding to property from hydraulic overload of combined sewer	South West Water
Esplanade Road	Internal flooding to property from failure of private drainage system	Property Owner
Esplanade Road	Internal flooding to property from surface water run-off from highway	Torbay Council Highways
Kingsway Court	Internal flooding to property as a result of surface water run-off	Torbay Council
Kings Ash Road	External flooding to highway as a result of blocked gullies	Torbay Council Highways
Osney Crescent	External flooding as a result of a blocked combined sewer	South West Water
Brixham Road	External flooding to highway as a result of blocked gullies	Torbay Council Highways
Clennon Valley	External flooding to highway as a result of blocked gullies	Torbay Council Highways
Occombe Valley Road	External flooding to highway as a result of blocked gullies	Torbay Council Highways

Brixham

Location	Type of Flooding	Risk Management Authority
Fore Street	External flooding to highway as a result of blocked gullies	Torbay Council Highways

Actions

Torbay Council Highways	Inspect the highway drainage system in the affected areas as identified above, clear any blockages and undertake regular cleaning of road gullies to ensure effective operation and reduce the risk of further flooding.
Torbay Council	Investigate surface water flooding issues to determine measures that can be undertaken where necessary to reduce the risk of future flooding.
South West Water	Investigate the condition and capacity of the combined sewer system in the affected areas, as identified above, in order to identify any repairs or improvement works that are necessary to reduce the future flood risk.
Torbay Council/Environment Agency/South West Water	To ensure flood risk is managed from new developments encourage the use of sustainable drainage practices for all new developments.
Environment Agency/Torbay Council	Where flooding is from an ordinary watercourse or main river investigations should be carried out into the condition and capacity of the watercourse/main river. Any maintenance or improvement works should be identified in order to reduce the risk of flooding.
Riparian Landowners	Must undertake regular maintenance/cleaning to ensure flows in the watercourses/main rivers are not restricted or blocked. If this is not carried out Torbay Council or the Environment Agency may consider carrying out enforcement if necessary.
Property Owners	Undertake regular maintenance of their private drainage system including pumps/non-return valves, flood protection measures, etc in order to reduce the risk of failure.
Property Owners	Consider flood risk to own property and consider installing property level flood protection where necessary

Next Steps

The next steps, following publication of this report into the 6th October 2012 flooding will be for Torbay Council as the Lead Local Flood Authority to ensure that the recommended actions identified at each flooding location are actioned by the relevant Risk Management Authority. Torbay Council will prioritise the actions and monitor delivery through regular review meetings whilst working in partnership with the Environment Agency, South West Water and the local affected community.

There is an expectation from Torbay Council of itself and its partners that all authorities involved will cooperate and work together to improve the flood risk in the vulnerable areas identified in this report by completing the actions. As the Lead Local Flood Authority Torbay Council has a responsibility to oversee the delivery of these actions.

Where minor works and quick win schemes have been identified, these will be prioritised and subject to available funding and resources work will be undertaken as soon as possible. Any major works requiring capital investment will be considered through the Environment Agency's Medium Term Financial Plan process for grant in aid funding.

A review of the actions will be undertaken by Torbay Council as Lead Local Flood Authority in order to maintain progress and encourage delivery of the recommended actions.