



WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report: **Charlbury**

July 2008

Version 1 – This report may be revised in the future to incorporate ongoing consultation results



Contents

1.0	INTRODUCTION	3
2.0	THE DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS.....	6
3.0	EXECUTIVE SUMMARY	7
4.0	SURVEY.....	8
5.0	PROBLEMS AND CAUSES	11
6.0	OPTIONS.....	13
7.0	CONCLUSIONS AND RECOMMENDATIONS.....	18
	Appendix 1: Photographs.....	20
	Appendix 2: Maps	26
	Appendix 3: Glossary.....	29

1.0 INTRODUCTION

On the 20th July 2007 large parts of the South of England were subjected to intensive storms. The scale and speed of the rainfall was unprecedented and took most communities by surprise causing widespread flooding of highways and property. On this occasion, unlike previous storms / flooding experienced, this impacted on many properties that had never been affected before, due to much of the flooding coming in the form of rain water run off from land.

A swathe of the district was particularly badly affected by the massive storms, which commenced in the morning and subsided in the evening. During the following days further disruption occurred due to rising river levels. At RAF Brize Norton, the records show that over 125 mm (5 inches) of rain fell in 12 hours, and this is a record going back over 100 years. Not only that, but the period from May to July had been the wettest on record since 1903 and meant that the ground was saturated and unable to absorb any more water.

On the 10th October 2007, the District Council's Cabinet considered a report of the Head of Street Scene and approved additional resources in order that a review of the affected areas could be carried out and further reports be prepared for the Council's considerations.

1.1 Purpose of the report

In response to requests from both the Parish and Town Councils and the general public West Oxfordshire District Council has produced a number of reports that identify each individual cause of flooding within the Parish / Town, what work is being carried out by external agencies (EA, Thames water etc); what the potential options are for future mitigation - and who might be best placed to fund such schemes. The reports themselves reflect the series of water systems that all played a part in the flooding experienced in July 2007 and will help all the organisations involved understand the need to sequence their activities.

This report has been prepared by a qualified Engineer in consultation with the key external agencies and seeks to explore the main reason behind why the floods happened in July 2007 and give an overview of the event itself. It will also provide an understanding of the different roles and levels of responsibility for the agencies involved.

This report should be used to make sure that all the agencies involved with flood prevention – like the Environment Agency, Thames Water, Oxfordshire County Council, Town / Parish Councils and private land owners – work in true partnership for the good of everyone in the local community.

A key outcome of the reports is that residents are given a broad overview of the complex linkages between the different organisations involved and also the range of options available.

1.2 Roles and responsibilities

One of West Oxfordshire District Councils key ongoing roles is to continue to lobby National agencies / Government on behalf of the residents and businesses of the district to secure funding and/or additional resources to assist with flood prevention and other relevant activities. The Council will also work closely with other agencies and organisation in order to highlight the local issues and actions identified in the report.

The legal responsibility for dealing with flooding lies with different agencies and is complex, so below is a simplified summary.

Environment Agency (EA) – permissive powers¹ for main rivers

Oxfordshire County Council (OCC) – Responsible for adopted highways and highway drainage.

Thames Water (TW) – Responsible for adopted foul and surface water sewers.

West Oxfordshire District Council (WODC) – duties as a riparian² land owner, and permissive powers¹ under Land Drainage Act 1991, Public Health Act 1936, Highways Act 1980 and Environmental Protection Act 1990.

Private land owners - duties as a riparian land owner.

1.3 Consultation and consent

The key organisations mentioned above are currently carrying out their own investigations, but operate independently of each other, have different methods of prioritisation and different funding criteria. The District Council has consulted with these agencies together with Parish Councils, Town Councils and individual property owners in order to prepare this report.

It is recognised that the majority of the options proposed in this report require further investigations / feasibility studies and / or consultation before they are carried out. Therefore these options may not be appropriate in every case when full costings, environmental, landscaping, biodiversity, built environment and historic factors are fully considered.

When considering protection against future flooding, it must be emphasised that the risk and impact of flooding can be mitigated against but in some cases not fully removed.

1.4 Response to this report

The options section of this report highlights the potential areas of work / activities under the responsible agency, for example the Environment Agency, West Oxfordshire District Council etc. If you have any specific questions relating to these activities please contact the relevant agency using the contact details provided at the top of the chart.

If you have any general questions please contact your Parish / Town Council who have been a key contributor to the production of the report and have agreed to act as the first point of contact.

The Council is also planning to hold a series of road shows in the Parish areas where representatives from all the relevant areas will be available to answer any questions local residents have as well as provide more information on ways residents may help themselves.

¹ Permissive powers are when an organisation may choose whether or not to exercise their powers. I.e. they are NOT under a duty. In making this choice account must be taken of any factors required by the legislation, plus for example how urgent, how necessary they are, cost, likely result, etc

² Riparian owners are responsible for the maintenance of any watercourse within or adjacent to the boundaries of their property.

1.5 Legal

No part of this report is to be reproduced, copied or used by any third party without the prior express written consent of WODC in its absolute discretion. All those reading this report acknowledge that any conditions, warranties or other terms implied by statute or common law are excluded to the fullest extent permitted by law. Without limiting the scope of the foregoing, West Oxfordshire District Council does not give any warranty, representation or undertaking as to the efficacy or usefulness of the information contained within this report, nor that any advice contained within this report will produce satisfactory results if followed. West Oxfordshire District Council hereby excludes liability to the fullest extent permitted by law for any reliance placed in this report by third parties.

2.0 THE DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS

Ditch Clearance

- 1731 Linear metres WODC owned ditches cleared overall
- 1923 Linear metres Privately owned ditches cleared overall
- Overall 2.27 miles of ditches have been cleared

Flood Grants

- 1137 WODC Flood Grants totalling £284,250 given out overall
 - 7 (£1,750) for Charlbury
- 112 Red Cross Flood Grants totalling £211,590 administered by WODC overall
- 301 Hardship Grants totalling £155,050 given out overall

Reports

- Interim Flooding Report published October 2007
- 12 Parish Flood Reports completed by June 2008, 1 report for Charlbury

Actions from the Council's Interim Report published in January 2008

- The table below provides a summary of some of the completed actions identified in the report

Bronze command procedure to be updated to recognise the need for ensuring shift rotas are in place in the early stages of an emergency
Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances
The emergency plan specifically addresses the need to keep in regular contact with elected members
That in future emergency situations District Councils ensure that they have a representative present at Silver Command from the start of the emergency to act as a conduit for information between Silver Command and the District Councils
The council should encourage all residents residing in the flood plain and in areas at risk of flooding to sign up to the EA Flood Alert system.
Provide clear information to residents and businesses about what type of waste we can collect and how it will be collected
Explanations to residents of our need for bulky waste to be placed on the roadside for collection
Commence a review of the mapping of the many thousands of privately owned ditches and culverts, and ensure they are kept clear and well maintained in accordance with the new policy (2 TOR 3)
Lobby central government for a single agency to take control of all land drainage issues
WODC continues to act in a coordination capacity with key external agencies
Continue to liaise with EA to ensure that procedures relating to planning consultations are robust. Seminar being arranged to take place during 2008 to progress this
Progress the Strategic Flood Risk Assessment
Approaches to be made to the EA and Metrological Office with regard to improving their predictive capability
During emergency events, have an external media person (BBC) in Bronze Command
Purchase digital TVs to assist with reviewing weather, local and national news to assist emergency management

3.0 EXECUTIVE SUMMARY

Following the flooding events of July 2007, West Oxfordshire District Council (WODC) has responded to requests from both Town and Parish Councils to aid the coordination of all the agencies and bodies that were undertaking their own investigations into the floods through the production of Parish Flood Reports.

This document is the Parish Flood Report for Charlbury and has been prepared by the Council's Engineering team. It pulls together information from external agencies and individual property owners and seeks to identify the causes of flooding in Charlbury during July 2007 and potential mitigating solutions.

Charlbury is a rural Parish located approximately six miles north of Witney and five miles south east of Chipping Norton. The River Evenlode flows through the south east of the Parish.

Visual walkover surveys have been undertaken of the flooded areas and properties. Meetings have been held with some of the affected residents. WODC have records of seven applications for Flood Relief Grant Aid within the Parish. The EA review of the summer 2007 floods in the Upper Cotswolds records that ten properties were flooded in Charlbury.

Flooding experienced in Charlbury has been assessed as three separate areas. Area 1 is Dyer's Hill Bridge and the immediate surrounding area, which suffered flooding from the River Evenlode caused by riparian vegetation and flow restrictions associated with the bridge. Area 2 is Charlbury Town, which was affected by surface water flooding as a result of sewers and drains. Area 3 is downstream of Charlbury Town, which was flooded directly as a consequence of overtopping of the River Evenlode.

Conclusions and recommendations, including maintenance and flood defence improvement measures and a programme, are provided in Section 7.

This report also includes Appendix 1 showing Photographs, Appendix 2 showing Maps and Appendix 3 provides a glossary.

4.0 SURVEY

4.1 Description of Area

The Parish of Charlbury is situated approximately six miles north of Witney and five miles south east of Chipping Norton. The Parish is rural in nature and forms part of the catchment area for the River Evenlode, which flows in a south easterly direction to the west of Charlbury. In addition, a number of spring-fed tributaries of the River Evenlode flow through the Parish.

The approximate catchment size, taken from the Flood Estimation Handbook, shows the area upstream of Dyer's Hill Bridge over the River Evenlode is around 225 km². The area benefits from the Environment Agency's flood warning service.

4.2 Survey Method

A visual walk-over survey of the area affected by the July 2007 flooding has been undertaken, including properties directly upstream and downstream of Dyer's Hill Bridge.

See Appendix 2 – Photographs.

4.3 Meetings

Table 1: Summary of meetings and flooding descriptions

Date	Location	Description
31.10.2007	Correspondence between WODC and Charlbury Town Council (CTC)	<ul style="list-style-type: none">• CTC provided information, including diagrams, on known flooding issues.• Information included the following:<ul style="list-style-type: none">○ Spelsbury Road: Ditches near to Farm entrance and Spelsbury Road buildings require regular attention otherwise the road can flood on the corner.○ Ditchley Road: Extensive surface water runoff during storms - water runs onto The Slade down Enstone Road across Bull Corner and into Church Street / Park Street. OCC are aware of this issue.○ Horbridge Dip (past Lees Rest on Woodstock Road in dip): Culvert needs to be kept clear as the road floods.○ Dancer's Hill: Culvert needs to be kept clear as the road floods.○ Watts Lane / Park Street: Water collects on the corner near to the Old Grammer School.
06.11.2007	Charlbury	<ul style="list-style-type: none">• Meeting with Estates Manager of Cornbury Estate, WODC and Environment Agency.• General works to remove debris from the river or to carry out general maintenance will not require consent from the EA.• More extensive works such as de-silting or bank profiling will require consent and may also require other licenses.• Development Control can advise on the consent / license requirements on a case-by-case basis.• The EA would expect that any proposed work to the Cornbury Estate bridge would include clearing the blocked flood arches and be undertaken in consultation with a structural engineer.• The Lord Rotherwick of Cornbury Estate has commissioned work to be undertaken and this is currently underway.

13.11.2007 – 19.11.2007	Correspondence between WODC and local resident	<ul style="list-style-type: none"> • Correspondence between WODC and local resident. • Resident informed that WODC has permissive powers under the Land Drainage Act 1991 and as such makes efforts to ensure that land owners maintain their drainage. • Also noted that WODC are working with other flood prevention agencies in the area, including OCC, TW and EA, to provide a co-ordinated approach. • Any future flood prevention measures that are proposed may not have prevented properties being flooded on 20th July since this was an unprecedented event. The aim will be to ensure that expected levels of heavy rainfall are dealt with effectively.
11.07.2008	Cornbury Estate	<ul style="list-style-type: none"> • Meeting with The Lord Rotherwick regarding information on the summer 2007 flooding, maintenance work since the flooding and planned maintenance work and ongoing concerns. • Flooding occurred on the Cornbury estate, including the Mill House, which flooded to the first floor. • Lord Rotherwick is the riparian owner of a reach of the River Evenlode and he commissioned work to clear vegetation from the banks of the river within the estate. This work is now underway and has so far involved clearing vegetation from the channel. Future plans involve removing vegetation from the river banks to improve the conveyance of floodwater onto the floodplain (i.e., open space on the Cornbury Estate). Desilting of the watercourse is also being considered. • In the past there have been issues with the management of ditches in the area. These are now largely under the control of the estate and are regularly maintained.
11.07.2008	Charlbury	<ul style="list-style-type: none"> • Meeting with residents to discuss summer 2007 flooding and ongoing concerns. • Flooding in the region of Dyer's Hill Bridge is attributed to flow restrictions caused by the Bridge and riparian vegetation. • Maintenance of river channel and bridge are highlighted as concerns.

Table 2: Stakeholder Communications and actions

Stakeholder	Description
TW	<ul style="list-style-type: none">• Jenny Elliott of Thames Water has been approached regarding plans for future work in Charlbury
WODC	<ul style="list-style-type: none">• See correspondence and meetings detailed in Table 1.
OCC	<ul style="list-style-type: none">• Gordon Hunt of Oxfordshire County Council Highways Department has been approached regarding plans for future work in Charlbury
EA	<ul style="list-style-type: none">• Phil Garvey and Nick Read were approached.• A review of the summer 2007 floods in Charlbury was undertaken as part of the EA's Upper Cotswolds Flood Review.• It has been confirmed that prior to the July 2007 floods the River Evenlode was graded as 'low' and 'medium' with regard to maintenance regime. Therefore, historically, maintenance on the River Evenlode has not been a priority in comparison to other watercourses in the area. A review has since taken place and some sections have been upgraded to 'high'. The upgraded sections are upstream of Charlbury near the Wychwoods. The increased maintenance regime could improve the conveyance of water downstream during a flood event. Whilst there is a large stretch of watercourse and associated floodplain between the Wychwoods and Charlbury, an improved maintenance regime upstream may increase flood risk to Charlbury.• Charlbury is known to be subject to flash flooding as a result of the steep nature of the catchment.

4.4 Application for Grant Aid

The District Council has distributed a range of financial support to the residents of district in the form of;

- Emergency Flood Relief Grant Aid of £250
- 'Hardship' Grants
- Red Cross Grants

To date the owners of seven residential properties in Charlbury have received Emergency Flood Relief Grant Aid, however it is acknowledged that this is not the total number of properties affected in the Parish as some owners have been reluctant to claim.

Whilst the Emergency Flood Relief Grant Aid was not paid to industrial and commercial properties, the Council did provide advice and support to local business affected by the flooding on funding available from Business Link and other organisations.

5.0 PROBLEMS AND CAUSES

5.1 Plans

Figure 1 in appendix 2 shows areas in Charlbury where properties flooded in July 2007 and where owners have made claims for grant assistance. The flooding can be broadly split into three areas being:

Area 1 – Dyer’s Hill Bridge and immediate surrounding area

Area 2 – Charlbury Town

Area 3 – Downstream of Charlbury Town

A map detailing the following is shown in Appendix 2:

- 1% annual probability of flooding - Flood Zone 3 (previously referred to as 1 in 100 year flooding)
A plan showing the 2008 Environment Agency 1% probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 1 per cent chance happening in any year. This is the high probability risk zone.
- 0.1% annual probability flooding – Flood Zone 2 (previously referred to as 1 in 1000 year flooding)
A plan showing the 2008 Environment Agency 0.1% probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 0.1 per cent chance happening in any year. This is the medium probability risk zone

5.2 Area 1 – Dyer’s Hill Bridge

Dyer’s Hill Bridge, also referred to as Charlbury Bridge, is the crossing of the B4437 (Forest Road / Dyer’s Hill) over the River Evenlode. During July 2007, the bridge surcharged and overtopped, making the B4437 impassable to vehicles and pedestrians. The Environment Agency’s review of the summer 2007 floods in the Upper Cotswolds notes that flood levels at Dyer’s Hill Bridge were in excess of that predicted during a flood event of 1% annual probability (see above for explanation). The Environment Agency issued a flood warning to Charlbury on 21st July 2008.

There was a large amount of vegetation within and on the banks of the River Evenlode both upstream and downstream of Dyer’s Hill Bridge. This included trees which had fallen across the channel. The vegetation restricted the conveyance of water and coupled with debris being transported by the floodwater, created a ‘dam’ effect causing water to overtop the river banks upstream of and around the bridge.

Six of the seven houses which claimed the WODC Flood Grants were located in the immediate vicinity of Dyer’s Hill Bridge. In addition, Charlbury Cricket Ground, located adjacent to the B4437 was flooded. Flooding was also reported on Mill Field and Pound Hill, which is located upstream of Dyer’s Hill Bridge, adjacent to the River. Mill Field is the area of land upstream of Dyer’s Hill Bridge between the main channel of the River Evenlode and the secondary channel that is controlled by sluice gates. Flooding on Mill Field / Pound Hill was caused by flow restrictions at Dyer’s Hill Bridge and the subsequent backing up of water.

Dyer’s Hill Bridge suffered significant damage during the flood event, including the collapse of the parapet wall on the downstream side of the bridge. In addition, one of the three arches of the bridge, which was purposely in-filled, was washed through due to the force of the water. In turn, this caused erosion of the bank adjacent to the previously in-filled arch. The railway bridge approximately 300 m downstream of Dyer’s Hill Bridge was not damaged by the flood.

Dyer’s Hill Bridge has since been repaired. The third bridge arch has not been re-filled, which will reduce the level of damage to the bridge during future flood event. Gabions have been installed to stabilise the banks in the vicinity of the bridge and repair the erosion.

5.3 Area 2 – Charlbury Town

Anecdotal records suggest that flooding attributed to surface water occurred at various locations within Charlbury Town, particularly due to the steep gradients in some parts of Charlbury.

Although the exact locations of surface water flood incidents are unknown, the Parish Council has provided some useful information on known locations that require regular maintenance due to recurrent surface water flooding. These areas include (but are not limited to) Ditchley Road, Spelsbury Road, Woodstock Road, Dancers Hill and Park Street. Due to the unprecedented rainfall in July 2007, it is likely that some of these locations were affected by surface water flooding.

The spring fed tributary of the River Evenlode, called Willow's Walk, flows through the town in both open channel and culvert. Flooding that occurred in the Dancer's Hill / Park Street area is attributed to Willow's Walk.

5.4 Area 3 – Downstream of Charlbury Town

During July 2007, flooding occurred downstream of Charlbury Town as a direct consequence of high water levels in the River Evenlode. The Environment Agency issued a flood warning to Charlbury on 21st July 2007. The River Evenlode forms the Charlbury Parish boundary at this location. The Mill House, which is to the west of the River Evenlode in adjacent Cornbury and Wychwood Parish, was flooded to first floor level and subsequently claimed Flood Grant. Although the Mill House is located in adjacent Cornbury and Wychwood Parish, flooding in this area extended into Charlbury Parish and has therefore been included in this review.

6.0 OPTIONS

The following table shows the possible options available for flood alleviation schemes throughout the Parish, and their potential effectiveness, as assessed by the District Council Engineers. The areas affected by flooding within the Parish have been given unique area numbers, i.e. Area I. Several options for flood alleviation projects are identified for each area as “Actions” or “Options”.

Many of these options will require further detailed investigation along with the agreement of the responsible landowner, identification of budget and a cost benefit analysis to be carried out before they could be implemented.

Some of the options shown are also mutually exclusive, that is if one option is carried out then another will not be necessary, to find if this is the case for an option, please look at the detailed description in the Conclusions and Recommendations Section (7.0).

If you require further information regarding a particular option, please contact the agency that would be responsible for implementation of the proposal, where this has been shown, using the contact information at the top of the column. If no contact details are shown, there may be a private landowner responsible. If this is the case the District Council will ensure that private landowners are made aware of their responsibilities.

Parish Flood Options										
Charbury										
Version 1 – July 2008										
Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
		For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
Area 1 – Dyer's Hill Bridge										
	Flooding in the immediate vicinity of Dyer's Hill Bridge, affecting properties upstream and downstream and making the road impassable.									
A	Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of the River Evenlode and other tributaries and ditches in the Parish.	To be undertaken in cooperation and agreement with the EA since the River Evenlode is a Main River.			WODC to co-ordinate	Landowner co-operation needed to clear and maintain river channels and ditches	Will restore effectiveness of channel to convey floodwater and allow water to flow onto floodplain thus reducing water levels at Charlbury	Will reduce flood risk upstream and in immediate surrounding area	to £5,000	The Lord Rotherwick has already commenced work on the Cornbury Estate.
B	Reprofile existing agricultural land upstream of Charlbury Town so that it functions as a Flood Storage Area.	To be undertaken in cooperation and agreement with the EA.			WODC to co-ordinate	Landowner and Parish Council cooperation required regarding use of land as Flood Storage facility.	Will reduce water levels and protect properties at risk of flooding	Will reduce flood risk downstream	to £5,000 study to £10,000 construction	Land owner not yet contacted.
C	Allocate Charlbury Cricket Ground (adjacent to Dyer's Hill Bridge) as a Flood Storage Area. This would involve constructing bunds and controls at the Cricket Ground. The bunds could be installed sympathetically, acting as a dual use to provide raised spectator areas.	To be undertaken in cooperation and agreement with the EA.			WODC to co-ordinate	Landowner cooperation required regarding use of Cricket Ground as Flood Storage facility.	Will reduce water levels and protect properties at risk of flooding	Will reduce flood risk downstream	to £5,000 study to £20,000 construction	Land owner not yet contacted
D	Ensure that the secondary channel on the River Evenlode upstream of Dyer's Bridge is fully operational (including the hand operated sluice gates) and, in accordance with Option A, is cleared of vegetation.				WODC to co-ordinate	Landowner and Parish Council co-operation required to clear and maintain secondary channel	Will restore effectiveness of channel to convey floodwater and allow water to flow onto floodplain thus reducing water levels at Charlbury	Will reduce flood risk upstream and in immediate surrounding area	to £5,000	Sluice gate operator not yet contacted

Option ref	Flood Overview	Description of work required					Key issues			Comments
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
	Options	For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
E	De-silting or dredging of 'pinch-points' on the River Evenlode, such as near to bridges, to increase the capacity of the channel.	To be undertaken in cooperation and agreement with the EA and with the necessary consents and licenses.			WODC to co-ordinate		Will restore effectiveness of channel to convey floodwater improve capacity of the channel thus reducing water levels at Charlbury	Will reduce flood risk upstream and in immediate surrounding area	to £5,000 study to £30,000 construction	
F	Open up any infilled flood arches in bridges over the River Evenlode in Charlbury that are designed to convey water and reduce structural damage to the bridge during periods of high flow.	To be undertaken in cooperation and agreement with the EA.	OCC to contribute if bridge carries adopted highway.		WODC to co-ordinate	Landowner and Parish Council co-operation required	Will allow water to pass downstream, reducing the water level. Will reduce the force on the bridge during a flood event limiting potential damage	Will reduce flood risk upstream and in immediate surrounding area	£5,000 - £10,000	
G	Flood-resilient measures on properties. Additionally the Parish needs to create its own emergency flood plan.	The EA website contains reference information on flood resilient measures to properties.			WODC to approve emergency flood plan.	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing of exterior walls, sand bags.	Only effective if defences are put in place before the water level rises.	May increase flood risk to adjacent properties as flood water will be displaced	to £5,000	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
Area 2 – Charlbury Town										
	Flooding attributed to surface water at various locations throughout Charlbury Town									
A	Undertake maintenance of existing drains, gullies and culverts. Cut grips where necessary.		OCC Highways to inspect current drainage provision and undertake maintenance, upgrades and provision of new management systems where necessary		WODC to co-ordinate		Will improve management of surface water and reduce the risk of surface water flooding to properties	Will reduce flood risk in immediate surrounding area and downstream	to £5,000	
B	Undertake upgrades and maintenance to sewer network where necessary			TW to investigate and upgrade / maintain as necessary			Will improve management of surface water and reduce the risk of surface water flooding to properties	Will reduce flood risk in immediate surrounding area and downstream	to £10,000	

Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
		For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
C	Cut grips and upsize drains on Ditchley Road, The Slade, Enstone Road, Brown's Lane, Church Street and Park Street.		OCC Highways to undertake upgrades.		WODC to co-ordinate		Will reduce the risk of surface water flooding.	Will reduce flood risk in immediate surrounding area.	to £5,000	
D	Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of Willow's Walk and other tributaries and ditches in the Parish. This would remove restrictions to flow, improve the capacity of the channel to convey flood water and allow flood water to pass onto the floodplain without backing up.	To be undertaken in cooperation and agreement with the EA since the River Evenlode is a Main River.			WODC to co-ordinate	Landowner co-operation required to clear and maintain secondary channel	Will restore effectiveness of channel to convey floodwater and allow water to flow onto floodplain thus reducing water levels at Charlbury	Will reduce flood risk upstream and in immediate surrounding area	to £5,000	
Area 3 – Downstream of Charbury Town										
	Flooding attributed to high flows in the River Evenlode caused flooding of land and property downstream of Charbury Town.									
A	Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of the River Evenlode and other tributaries and ditches in the Parish. This would remove restrictions to flow, improve the capacity of the channel to convey flood water and allow flood water to pass onto the floodplain without backing up.	To be undertaken in cooperation and agreement with the EA since the River Evenlode is a Main River.			WODC to co-ordinate	Landowner co-operation needed to clear and maintain river channels and ditches	Will restore effectiveness of channel to convey floodwater and allow water to flow onto floodplain thus reducing water levels at Charlbury	Will reduce flood risk	to £5,000	
B	Construct bunds at the Cricket Ground and / or reprofile existing agricultural land upstream of Charbury Town so that it functions as a Flood Storage Area.	To be undertaken in cooperation and agreement with the EA.			WODC to co-ordinate	Landowner cooperation required regarding use of land as Flood Storage facility.	Will reduce water levels and protect properties at risk of flooding	Will reduce flood risk	to £5,000 study to £10,000 construction	Landowners have not been contacted
C	De-silting or dredging of 'pinch-points' on the River Evenlode, such as near to ridges, to increase the capacity of the channel.	To be undertaken in cooperation and agreement with the EA and with the necessary consents and licenses.			WODC to co-ordinate		Will restore effectiveness of channel to convey floodwater and improve capacity of channel to reducing water levels at Charlbury	Will reduce flood risk	to £5,000 study to £30,000 construction	

Option ref	Flood Overview	Description of work required					Key issues			Comments
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
	Options	For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
D	Flood-resilient measures on properties. Additionally the Parish needs to create its own emergency flood plan.	The EA website contains reference information on flood resilient measures to properties.			WODC to approve emergency flood plan.	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing of exterior walls, sandbags.	Only effective if defences are put in place before the water level rises.	May increase flood risk to adjacent properties as floodwater will be displaced	Up to £5k	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Area 1 – Dyer’s Hill Bridge

7.1.1 Maintenance

The following ongoing maintenance is recommended:

- Option A - Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of the River Evenlode and other tributaries and ditches in the Parish. This would remove restrictions to flow, improve the capacity of the channel to convey flood water and allow flood water to pass onto the floodplain without backing up.
- Option D - Ensure that the secondary channel on the River Evenlode upstream of Dyer’s Bridge is fully operational including the hand operated sluice gates and (in accordance with Option A) is cleared of vegetation.

7.1.2 Flood defence improvement schemes

Immediate (under 1 year)

- Option F - Open up any infilled flood arches in bridges over the River Evenlode in Charlbury that are designed to convey water and reduce structural damage to the bridge during periods of high flow.
- Option G - Flood-resilient measures on properties. Additionally the Parish needs to create its own emergency flood plan.

Mid-Term (under 1 -2 years)

- Option B - Reprofile existing agricultural land upstream of Charlbury Town so that it functions as a Flood Storage Area.
- Option C - Allocate Charlbury Cricket Ground (adjacent to Dyer’s Hill Bridge) as a Flood Storage Area. This would involve reprofiling the Cricket Ground to enhance the storage capacity.

Long-Term (3 years or more)

- Option E - De-silting or dredging of the River Evenlode to increase the capacity of the channel.

7.2 Area 2 – Charlbury Town

7.2.1 Maintenance

The following ongoing maintenance is recommended:

- Option A - Undertake maintenance of existing drains, gullies and culverts. Cut grips where necessary.
- Option B - Undertake upgrades and maintenance to surface water sewer network where necessary.
- Option D - Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of Willow’s Walk and other tributaries and ditches in the Parish. This would remove restrictions to flow, improve the capacity of the channel to convey flood water and allow flood water to pass onto the floodplain without backing up.

7.2.2 Flood defence improvement schemes

Immediate (under 1 year)

- Option C - Cut grips and upsize drains on Ditchley Road, The Slade, Enstone Road, Brown's Lane, Church Street and Park Street.

7.3 Area 3 – Area Downstream of Charlbury Town

7.3.1 Maintenance

The following ongoing maintenance is recommended:

- Option A - Riparian owners to actively manage vegetation in the channel and on the banks and adjacent land of the River Evenlode and other tributaries and ditches in the Parish. This would remove restrictions to flow, improve the capacity of the channel to convey flood water and allow flood water to pass onto the floodplain without backing up.

7.3.2 Flood defence improvement schemes

Immediate (under 1 year)

- Option D - Flood-resilient measures on properties. Additionally the Parish needs to create its own emergency flood plan.

Mid-Term (under 1 -2 years)

- Option B - Reprofile existing open space / agricultural land upstream of Charlbury Town so that it functions as a Flood Storage Area.

Long-Term (3 years or more)

- Option C - Desilting or dredging of the River Evenlode to increase the capacity of the channel.

Appendix I: Photographs



Flooding at Dyer's Hill Bridge in July 2007 (Source BBC News Website)
The parapet wall on the left of the photograph has been damaged by the flood.



Flooding at Charlbury Cricket Ground in July 2007 (courtesy of Mr R. Clarke)



Flooding in Charlbury near to Dyer's Hill Bridge in July 2007 (courtesy of Mr R Clarke)



Cars submerged in Pound Hill/ Spelsbury Rd. Charlbury in July 2007 (courtesy of Mr R Clarke)



Flooding in Mill Lane Charlbury in July 2007 (courtesy of Mr R Clarke)



High water levels and fast flowing water in the River Evenlode in Charlbury in July 2007 (courtesy of Mr R Clarke)



Flooding on the Cornbury Estate in Charlbury in July 2007 (courtesy of Mr R Clarke)



Looking upstream on the River Evenlode towards Dyer's Hill Bridge (taken July 2008).
Prior to the flood event, one of the three arches was blocked. All three arches are now clear to allow flow to pass through. The parapet wall was damaged by the flood and this has now been rebuilt.



Looking upstream on the Mill Cut from Pound Hill / Water Lane (taken July 2008).



Looking downstream on the Mill Cut from Pound Hill / Water Lane (taken July 2008).
Vegetation in the channel poses a restriction to the flow of water, although this situation has occurred since July 2007.