



WEST OXFORDSHIRE  
DISTRICT COUNCIL

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# Parish Flood Report: **Clanfield**

May 2008



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## **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 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 (Environment Agency, 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 organisations 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 powers<sup>1</sup> 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 riparian<sup>2</sup> land owner, and permissive powers<sup>1</sup> 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.

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<sup>1</sup> 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

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

## **1.5 Legal**

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## 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
  - 60 (£15,000) for Clanfield
- 40 Red Cross Flood Grants totalling £80,929 administered by WODC overall
  - 2 (£1,400) for Clanfield
- 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 Clanfield

### 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 the Parish of Clanfield 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 Clanfield during July 2007 and potential mitigating solutions.

Clanfield is a rural parish located approximately 8 miles to the south west of Witney and 8 miles south of Burford on the edge of the Cotswolds. The parish sits in the catchment of the River Thames and contains several small tributary watercourses.

Clanfield falls within the River Thames flood warning area St Johns Lock at Lechlade to Eynsham Lock near Oxford.

Visual walkover surveys have been undertaken of the flooded areas and properties and meetings have been held with some affected residents. WODC have record of 60 applications for Flood Grant Aid in Clanfield.

Flooding experienced in Clanfield has been assessed as three areas (see section 5.1) comprising:

- Bampton Road/Marsh Lane (Area 1)
- Black Bourton Bends, Calcroft Lane to Main Street (Area 2)
- Main Street (Area 3).

The Bampton Road/Marsh Lane (Area 1) had not suffered from flooding for at least 10 years prior to the July 2007 flood event. In July 2007, 11 properties were flooded, with the exception of one house that had been flash flooded in 2000. Flooding has been attributed the Black Bourton Brook and local drainage ditches with poor maintenance being a major contributing factor.

The Black Bourton Road between Calcroft Lane and Main Street (Area 2) has record of 3 properties flooding during the July 2007 event. This stretch of road often floods causing hazardous driving conditions especially in the winter when water freezes on the road. Flooding in this area has been attributed to the Clanfield Brook which flows along the eastern verge of the road in a shallow channel (see photographs 5, 7 and 8), the BT manhole (photographs 7 and 8) and poor maintenance of ditches carrying surface water from a drain that runs to the north of Chestlion Farm (photographs 8 and 9).

On Main Street (Area 3), WODC has a record of 33 properties flooding during July 2007 and claiming flood grant aid. Flooding in this location is due to the Clanfield Brook which runs along the eastern side of the road and flood water from the Black Bourton Brook which during the July event, flowed down the Bampton Road onto Main Street. A number of bridges and driveways cross the Clanfield Brook restrict flows, further contributing to flooding (photograph 16).

There is also concern over the condition and maintenance of the Radcot Cut to which the Marsh Lane ditch, Clanfield Brook, Black Bourton Brook and Broadwell Brook discharge prior to its confluence with the River Thames. Meetings with local residents indicate that the River Thames was not a primary concern during the July flood event. At the onset of flooding, the River Thames and its floodplains were not inundated; it took at least 20 hours for flood waters to back up from the Thames along the Radcot Cut.

Flooding problems and how each public and private body is affected, effectiveness of each solution, affects on adjacent land and cost, are included in Section 5. Conclusions and recommendations, including maintenance and flood defence improvement measures and programme, are shown in Section 7.

## **4.0 SURVEY**

### **4.1 Description of Area**

Clanfield is a rural parish on the edge of the Cotswolds containing 350 homes and around 800 inhabitants. It was also mentioned in the Domesday Book. The parish sits in the catchment of the River Thames and contains four spring fed tributary watercourses as described below:

- The Black Bourton Brook flows in a south easterly direction flowing to the east of the village centre. The Brook rises in Black Bourton where it branches from the Shill Brook at an unattended weir before flowing south easterly to its confluence with the Radcot Cut at Sharney Bridge and onto the River Thames at Shifford.
- The Clanfield Brook flows through the centre of the village in a southerly direction. The Brook is spring fed, rising in the village of Alvescott to the north west of Clanfield. The Brook crosses the abandoned railway, and flows in a southerly direction to Calcroft Lane where it runs parallel to the lane on the south side.
- The watercourse then crosses the Black Bourton Road and turns sharply to flow in a southerly direction through Black Bourton Bends, onto Main Street and Friars Court. On reaching Friars Court, the Clanfield Brook is joined by the Broadwell Brook, turns to a south easterly direction and flows onto the Radcot Cut (approximately 800m to the west) and near Bushy Lock and the river Thames,
- A number of drains join the Clanfield Brook as it flows through Clanfield including highway and field drainage from the north along Black Bourton Road at the junction with Calcroft Lane, groundwater and field drainage from a small spring fed drain to the north of Calcroft Lane and two drains, one to the north of Chestlion Farm and one at Windmill Farm.
- The Broadwell Brook flows in an easterly direction to the south of the Village. The Brook rises in Broughton Poggs, flows through control structures at Clanfield Mill and onto its confluence with the Clanfield Brook at Friars Court.
- The Radcot Cut flows along the southern boundary of the Parish and is joined by all three watercourses described above, before flowing in a easterly direction to its confluence with the River Thames near Bushy Lock.

### **4.2 Survey Method**

A visual walkover survey of properties affected by the July 2007 flooding has been undertaken and discussions have been held with WODC and some local residents.

See Appendix I – Photographs.

### **4.3 Meetings**

Details of meetings about the flooding experienced at Clanfield flooding in July 2007 are given in Table I.



Table I: Summary of meetings and flooding descriptions

Date	Location	Description
03.09.07	Clanfield	<ul style="list-style-type: none"> <li>• Meeting with local residents and WODC representatives as highlighted in the WODC Interim Report “2007 Summer Floods”</li> </ul>
22.10.07	Main Street, Clanfield	<ul style="list-style-type: none"> <li>• Internal flooding of property 7 times in 9 years (between 1998 and 2007).</li> <li>• Flooding from sewer manhole in pavement which has been raised above internal floor level when the pavement was constructed.</li> <li>• Flooding from groundwater rising through floors and walls of property.</li> </ul>
14.11.07	WODC, Clanfield Parish Councillor and local farmer	<ul style="list-style-type: none"> <li>• Black Bourton Brook</li> <li>• Discussion regarding the condition of the Brook as it crosses the A4095. The landowner of farmland adjacent to the watercourse has asked for permission to clear the watercourse to prevent flooding to his land. This has been refused by the EA on two occasions.</li> <li>• Discussion regarding the bridge crossing of the A4095 Bampton Road. This has become silted up and requires clearing by OCC.</li> <li>• Historical information regarding the bed level in the Black Bourton Brook at this location is being sought.</li> </ul>
18.11.07	Coronation Cottages	<ul style="list-style-type: none"> <li>• Letter to WODC voicing concern over the over grown Clanfield Brook and bridges which create dams. “After heavy rain the little bridges frequently cause a blockage”</li> </ul>
18.03.08	OCC, Alan Crisp, John Bowler	<ul style="list-style-type: none"> <li>• Black Bourton Bends, OCC suggest:</li> <li>• There is no intention of straightening the S bend due to the danger of a straight road from Alvescot to the centre of Clanfield.</li> <li>• The two wooden bridges that cross the Clanfield Brook be raised and restructured to remove supports located in the channel and increase capacity.</li> <li>• Tree trunks and branches that impede flow to be removed.</li> <li>• The sandbagged wall on the side of the Brook is to be replaced by concrete to prevent collapse.</li> <li>• The tarmac pedestrian path be repaired to prevent slippage into the Brook.</li> <li>• Widen the road where possible to prevent verges being pushed into the Brook. Where this is not possible kerbing works should be undertaken to protect the road edge.</li> <li>• BT to carry out works on their manhole to prevent seepage of water.</li> <li>• EA to carry out channel deepening works – lower bed.</li> <li>• Widening of the Brook and improvements to the path. Seek to use common land at the bottom of gardens in Bourton Close.</li> </ul>

24.02.08	Alan Crisp, WODC, John Bowler	<ul style="list-style-type: none"> <li>• Marsh Lane/Bampton Road</li> <li>• Landowner to create shallow ditch at the western end of his field where it adjoins the village. Soil removed to be used to create a bank to act as a protective barrier. New ditch to feed into existing ditch running parallel to A4095 Bampton Road. OCC have cleared ditch recently.</li> <li>• Small ditch parallel to A4095 feeds through a small culvert under a driveway access. This is partially blocked by a tree. WODC have removed the tree, roots need to be ground away. OCC have offered to replace the culvert with a larger capacity pipe.</li> <li>• Two culverts carry water from the ditch under A4095 to the Marsh Lane ditch. OCC will check their operation.</li> <li>• At exit of culverts on Marsh Lane, the verges have been narrowed by vehicle pressure leading to a potential collapse of ditch. OCC will re-construct the bank, bring side of the road to the correct height and install bollards.</li> <li>• Marsh Lane ditch needs to be maintained and farm access crossings assessed. The first crossing should be increased in capacity, the second crossing can be removed – further crossings need to be addressed.</li> <li>• This Bampton Road flood alleviation scheme can not proceed until this ditch is flowing freely and this is the responsibility of the riparian owner.</li> </ul>
26.02.08	John Bowler, response re flood issues to WODC interim report	<ul style="list-style-type: none"> <li>• Contact was made to EA floodline regarding the Clanfield Brook and potential to flood. Reponse given was “we only deal with real rivers, try the AA”</li> <li>• Contact was made with AA regarding same watercourse, response was an out of date recorded message saying that there was only one road closed in Oxfordshire at that time when there must have been 20 or more.</li> </ul>
06.05.08	WODC	<ul style="list-style-type: none"> <li>• Meeting with WODC to describe flooding mechanisms at Clanfield.</li> </ul>
12.05.08	Marsh Lane Clanfield	<ul style="list-style-type: none"> <li>• Meeting with John Bowler and Alan Crisp and site walkover to describe flood mechanisms in the Parish</li> </ul>

WODC has liaised with the Environment Agency, Oxfordshire County Council and Thames Water. OCC, WODC and the EA have met with residents of Clanfield to discuss the flooding issues.

Table 2: Summary of telephone calls/emails/correspondence made with EA, TW, British Telecom (BT), WODC and OCC.

Agency	Comments
OCC	<p>04/01/08 OCC have filled in the hole on the road at Black Bourton Bends but believes that some of the material has been washed out so OCC have been requested to re-do the work.</p> <p>Gordon Hunt at OCC suggested following at meeting on 18<sup>th</sup> March 08:</p> <ul style="list-style-type: none"> <li>Tree trunks and branches that impede flow be removed.</li> <li>The sandbagged wall on the side of the Brook be replaced by concrete to prevent collapse.</li> <li>The tarmac pedestrian path be repaired to prevent slippage into the Brook.</li> <li>Widen the road where possible to prevent verges being pushed into the Brook. Where this is not possible kerbing works should be undertaken to protect the road edge.</li> <li>BT to carry out works on their manhole to prevent seepage of water.</li> <li>EA to carry out channel deepening works and lower bed.</li> <li>Widening of the Brook and improvements to the path. Seek to use land at the bottom of gardens in Bourton Close.</li> </ul>
WODC	<p>07/03/08 work carried out to fell the tree adjacent to highway on A4095 at Clanfield Village boundary.</p> <p>WODC have complete an interim report 2007 summer floods.</p> <p>WODC have visited local residents on Main Street to collect details of flooding for meetings with Thames Water.</p>
EA	<p>The EA have recommended/completed the following:</p> <p>January 2008, EA published a flood review for Brize Norton, Clanfield &amp; Bampton. The following comments regarding Clanfield were made:</p> <ul style="list-style-type: none"> <li>The Clanfield Brook is part of the Radcot Cut system which currently has a medium risk designation from April 2008 and is cleared of vegetation each year, generally in the autumn to remove summer growth.</li> <li>The Clanfield Brook was de-silted by the EA in 2003 with nominal build up since this date.</li> <li>The Black Bourton Brook is trimmed and weed cut annually early in the year from the confluence with the Shill Brook in Black Bourton downstream for 500m to help pass river flows away from Black Bourton.</li> <li>Add hoc removal of obstructions including fallen trees takes place in the lower reaches of the Black Bourton Brook which runs downstream from the Bampton Road to the Radcot Cut. This section was cleared during November 2007 and is planned to be de-silted during July 2008.</li> </ul> <p>EA state that flood risk benefits from de-silting and bank clearance on the Black Bourton Brook will not be significant due to existing culverts which limit flow, cause banking up and increase upstream water levels.</p> <p>EA state that whilst clearance of waterways would benefit the Clanfield Brook in lower order flood events, the scale of July event exceeded anything that could be alleviated by simple channel clearance alone.</p> <p>EA can't justify any engineering options for flood defence works for Clanfield due to the high costs involved and small number of properties that would benefit.</p> <p>The EA will work with riparian owners to increase awareness of riparian landowner rights and responsibilities on Clanfield Brook and local land drainage systems.</p> <p>EA representatives have visited Clanfield and completed a site walkover.</p>

TW	<p>A contractor of TW has visited a property affected by flooding on Main Street. It was suggested that flip valves be installed which will prevent overflow of sewage.</p> <p>A meeting was held with parish councillors and representatives of Thames Water to discuss sealing manholes and fitting anti flood valves.</p> <p>Thames Water wrote to a resident of Main Street on 09.03.01 enclosing an anti flood valve.</p> <p>15.05.08 – Call to Thames Water to ask what work is proposed for Clanfield. Thames Water confirmed that they are not planning any work in Clanfield over the next two years.</p>
BT	<p>BT do not want to install duct seals on the services at Black Bourton Bends as it may damage equipment. There is potential to create a lateral drain from the manhole if the Clanfield Brook has the capacity to receive water.</p>

#### 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

There have been 60 applications for Grant Aid from Clanfield. Many locations have been surveyed to verify the claim. All claimants have been given a sum of £250 towards Emergency Aid. This equates to 14.4% of the total number of properties affected in West Oxfordshire due to the events of July 2007.

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 Clanfield 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: East of the Village, Bampton Road/Marsh Lane

Area 2: The Black Bourton Road between Calcroft Lane and Main Street

Area 3: Main Street

Further maps and plans can be found in Appendix 2 as described below:

- 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 of 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
- Flood outline July 2007, drawn by Martin Cobden a local resident. This drawing should be used for discussion only as is the opinion of a resident and may not be wholly factual.

### **5.2 Area 1 – East of the Village – Bampton Road/Marsh Lane**

In July 2007, 11 properties located on the Bampton Road claimed Flood Grant Aid.

6 of these properties are located in the 2007 Environment Agency 0.1% probability of flooding (previously referred to as 1 in 1000 year Flood Zone) and 5 properties are not located in any of the Environment Agency Flood Zones.

Flooding is attributed to the following:

#### **5.2.1 Flooding from the Black Boughton Brook**

Flooding to the east of Clanfield in July 2007 was caused by the Black Boughton Brook breaching its banks. Flooding was located predominantly north of the A4095 as shown on the Historical Flood Outline Plan included in Appendix 1.

As water levels rose in the Black Bourton Brook, the bank on the village side overflowed and water flowed across farmland to the east of the village. The existing drainage system, a ditch and culvert carrying water to the Marsh Lane ditch was overwhelmed and flood water continued to flow down Bampton Road in a westerly direction onto the village Main Street. This worsened flooding experienced in Main Street from the Clanfield Brook. (Photograph 1 shows flood water looking down Bampton Road towards Main Street).

The Black Bourton Brook is enained and as such the EA have permissive powers for maintenance. However, the central section of the Brook had not been cleared for 5 years prior the rainfall event and was full of vegetation and silt with overhanging trees, broken branches and collapsed banks. Local residents report that in many places the bed level of the southern section was as high as adjacent fields leading to the ditches being unable to function or the fields to drain properly.

Inadequate maintenance of the watercourse has also reduced the potential volume of water that can be passed under the road bridge crossing of the Bampton Road.

#### 5.2.2 Highway Drainage and Overland Flow

During the flood event of July 2007, roads became rivers partly due to the volume of surface water and partly due to overland flow from adjacent farmland.

The A4095 Bampton Road highway drainage links to drainage ditches which run parallel to the road which also serve to collect overland flow from adjacent farmland. However, these ditches tend to be field ditches so they do not link with any drainage system.

Flood water from the short parallel drainage ditch on the northern side of the A4095 Bampton Road then flows through two culverts running under the Bampton Road to the Marsh Lane ditch on the eastern site of Marsh Lane.

In July 2007 the Marsh Lane ditch was substantially blocked leading to flooding.

On the northern side of the A4095, the drainage ditch is crossed by a driveway access with a culvert which constrains flow and was also partly blocked (photograph 3 and 4).

At the entrance to Marsh Lane where the surface water drainage culverts discharge, the verges have been pressed in by heavy vehicles, leading to debris falling into the Marsh Lane ditch, reducing the channel capacity.

It is imperative that the eastern Marsh Lane ditch remains clear to its confluence with the Radcot Cut in order that flow is maintained during periods of heavy rain.

The ditch on the western side of Marsh Lane has little flow and whilst this ditch is not as important as the eastern ditch, nevertheless this should not be ignored.

### 5.3 Area 2: The Black Bourton Road between Calcroft Lane and Main Street

In July 2007, 3 properties claimed flood damage grants on the Black Bourton Road between Calcroft Lane and Main Street.

These properties are located in the 2007 Environment Agency 0.1% probability of flooding (previously referred to as 1 in 1000 year Flood Zone).

Flooding is attributed to the following:

#### 5.3.1 Clanfield Brook

Flooding on the Black Bourton Road between Calcroft Lane and Main Street was primarily caused by the Clanfield Brook. The Clanfield Brook runs parallel to the Calcroft Lane and crosses the Black Bourton Road via a piped culvert before turning sharply to run parallel to the Black Bourton Road.

During July 2007 the Brook burst its banks and water flowed onto the Black Bourton Road and flooded properties. Flood water then flowed along the road to the village (photograph 6). The Clanfield Brook is an emained river and as such the EA have permissive powers for maintenance.

#### 5.3.2 Poor maintenance of drainage ditches

A small drainage ditch draining land behind Chestlion Farm flows in a ditch, under the Chestlion Farm driveway access and enters a culvert under the Black Bourton Road to join the Clanfield Brook.

During periods of prolonged heavy rainfall flooding occurs on the Black Bourton Road between the Plough Hotel and Chestlion Lane. There are two causes. Firstly, poor maintenance and subsequent blockage of the drainage ditch located on the west of the road then allows water to flow directly onto the road. Secondly, the Clanfield Brook is exceptionally narrow and shallow at this point and often floods. (See photographs 8 and 9)

#### 5.3.3 Leaking BT manhole

BT own a manhole located on the Black Bourton Bends just south of the Chestlion Farm access. This manhole regularly leaks water onto the Black Bourton Road, even when the rest of the road is dry. During the winter months this water freezes causing a hazard to motorists and pedestrians. During periods of prolonged rainfall water rushes from the manhole contributing to flooding of the Black Bourton Road.

### 5.4 Area 3 – Main Street

In July 2007, 35 properties located on Main Street claimed Flood Grant Aid.

13 of these properties are located in the 2007 Environment Agency 0.1% probability of flooding (previously referred to as 1 in 1000 year Flood Zone), the remainder are not highlighted by the EA as being at risk from flooding from fluvial sources.

Flooding is attributed to the following:

#### 5.4.1 Clanfield Brook

The Clanfield Brook flows parallel to Main Street on the eastern side. There are numerous bridge crossings, some of which restrict flow, push flood waters onto the highway and flood surrounding property (photograph 16).

However, the major contributing factor was that the Brook had not been cleared out for 10 months or so and was full of weed. The water could not therefore reach the floodplain. These waterways need to be cleared two or three times a year, not once.

#### 5.4.2 Radcot Cut and River Thames

The Clanfield Brook flows to the Radcot Cut which joins the River Thames downstream. It is important to note that during the flood event of July 2007, the floodplains of the River Thames were not inundated and did not restrict flows in the Clanfield Brook.

The EA stated in their Flood Review July 2007 covering Clanfield that “6 days after the event (26th July 07) we noted that the junction of Black Bourton Road with Bampton Road was still flooded. This was due to high levels in the Radcot Cut and River Thames (downstream of Clanfield Brook) as the surrounding area drained, limiting drainage of the smaller watercourses”

#### 5.4.3 Groundwater ingress

As rainwater fell and was unable to drain away, groundwater levels rose causing internal flooding to some properties on Main Street.

#### 5.4.4 Sewer flooding

A property on Main Street has experienced sewer flooding which has been attributed to raising of the pavement and manhole outside their property. This has led to internal flooding.



## 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										
Clanfield										
Version 1 – May 2008										
Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private (riparian)	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 Parish Council: John Bowler: 01367 810 622 Alan Crisp: 01367 810 452					
<b>Area 1 – Bampton Road/Marsh Lane</b>										
	<b>Black Bourton Brook</b> As water levels rose in the Black Bourton Brook, the bank on the village side overflowed and water flowed across farmland and along the Bampton Road to the east of the village.									
<b>A</b>	Carry out maintenance and lowering of bed in Black Bourton Brook from the crossing of the Bampton Road, north.	Black Bourton Brook is enmained. EA to carry out maintenance.  Consent required if anyone else is to complete work.			WODC to provide co-ordination role with EA if required.	Landowner willing to complete work with consent from EA.  Trim as necessary		Will transfer more water downstream and improve local land drainage.	Up to £5k per visit	Local landowners have approached the EA on two occasions and have been refused permission to carry out dredging of the channel.
<b>B</b>	Create shallow ditch at the western end of farmers field where it adjoins the village (to the west of Black Bourton Brook).  Soil removed to be used to create a bank to act as a protective barrier.  New ditch to feed into existing small ditch running parallel to A4095 Bampton Road.		The existing ditch has been cleared by OCC as a gesture of good will.  Existing crossing of driveway access and A4095 would have to be re-sized to accommodate increased flow to ditches.		WODC to provide a co-ordination role	Landowner to complete ditching work and future maintenance	Will reduce water from flowing to the village as flood water from the Black Bourton Brook will be contained in the new drainage channel.	Will transfer more water downstream to Radcot Cut.	Minimal cost to Landowners  Up to £5k to re-size existing culvert crossing	Landowner is happy to complete ditching works
<b>C</b>	Maintain the bridge crossing of the Bampton Road to increase capacity.	EA to be consulted on works in the watercourse.	OCC to de-silt road bridge crossing of Bampton Road and lower bed to increase bridge capacity.		WODC to provide a co-ordination role		Maintaining bridge capacity will reduce surcharging of flows onto adjacent farmland.	Will transfer more water downstream to Radcot Cut	Up to £5k	OCC have been approached regarding this option

Option ref	Flood Overview	Description of work required					Key issues			Comment
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private (riparian)	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 Parish Council: John Bowler: 01367 810 622 Alan Crisp: 01367 810 452					
<b>Area I – Bampton Road/Marsh Lane</b>										
<b>D</b>	Flood resilient measures to properties in the 0.1% probability (1 in 1000 year floodplain)	The EA website contains reference information on flood resilient measures to properties.			WODC to provide a co-ordination role	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.	None	Up to £5k	Homeowners have not been approached.
	<b>Highway drainage and overland flow</b> During the flood event of July 2007, the roads became rivers partly due to the volume of surface water and partly due to overland flow from adjacent farmland.									
<b>E</b>	Remove obstructions to flow in small drainage ditch running parallel to A4095 Bampton Road.				WODC have removed tree located in drainage ditch parallel to A4095. Roots still need to be ground away	Riparian owners to increase size of culvert under driveway access	Upsizing culvert will reduce surcharging of flows and will increase flow to Marsh Lane ditch. Removal of tree will reduce potential for blockage of ditch	Reduced flood risk	£500 for tree removal  Up to £5k for new culvert	WODC have agreed to organise works to remove tree roots
<b>F</b>	At exit of culverts on Marsh Lane, verges have been pressed in with potential collapse of ditch.		OCC to re-construct the bank, bring side of the road to the correct height and install bollards.				Works will stop farm traffic damaging verge with potential to block ditch. This will maintain flow route to Radcot Cut	Reduce flood risk to surrounding land	£5k to £20k	OCC have agreed to complete this work
<b>G</b>	Marsh Lane eastern ditch needs to be maintained and farm access crossings assessed. The first crossing should be increased in capacity, the second crossing can be removed – further crossings need to be addressed.			TW potentially required to clear ditch section adjacent to pumping station	WODC to provide coordination role and ensure work is completed.	Riparian owners to maintain crossings on Marsh Lane ditch  WODC to confirm ownership of Marsh Lane ditch as it progresses to the Radcot Cut – especially section adjacent to TW pumping station	Will remove blockages to Marsh Lane ditch, ensure passage of water to Radcot cut and reduce potential flood risk upstream	Reduce flood risk to surrounding land	£500 to £5,000 per crossing	WODC have asked landowner that the ditch be cleared.
<b>H</b>	Maintenance of the two culverts that carry water from parallel ditch under A4095 to Marsh Lane ditch.		OCC to check their operation and jet or enlarge if needed		WODC to provide coordination role		Will reduce potential flooding upstream due to blockages of culvert.	Reduce flood risk to surrounding land	Up to £5k	OCC installed second culvert in 2003 following flooding.
<b>I</b>	Create a raised section on the Bampton Road at the entrance to Clanfield on the Marsh Lane junction with A 4095. This will create a barrier to flow and direct water to Marsh Lane and away from the village.		OCC to carry out feasibility include street lighting requirements. The raised section would act as traffic calming but feasibility on the busy A 4095 is required.		WODC to provide co-ordination role		Will prevent some flood water from surrounding farmland and Black Bourton Brook from flowing to the village	May lead to more flooding in Marsh Lane area as flows are directed away from the village	Up to £5k feasibility  Up to £5k construction	This proposal requires further thought and consultation

Option ref	Flood Overview	Description of work required					Key issues			Comment
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private (riparian)	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 Parish Council: John Bowler: 01367 810 622 Alan Crisp: 01367 810 452					
<b>Area 2 – The Black Bourton Road between Calcroft Lane and Main Street</b>										
	<b>Clanfield Brook</b>  During July 2007 the brook burst its banks and water flowed onto the Black Bourton Road and flooded properties.									
<b>A</b>	EA to carry out de-silting works – lower bed	EA to de-silt Clanfield Brook channel at Black Bourton Bends	OCC have agreed to complete this work subject to EA consent		WODC to provide coordination role		Will increase channel capacity and reduce potential flood risk	Will transfer more water downstream	Up to £5k to complete bed lowering	Local villagers recall the brook bed being far lower historically than it is today.  The Clanfield Brook was de-silted by EA in 2003.
<b>B</b>	The two wooden bridges that cross the Clanfield Brook at Black Bourton Bends are to be raised and restructured to remove supports located in the channel and increase capacity.		OCC completed work May 2008		WODC to provide coordination role		Will increase channel capacity.	Will transfer more water downstream	Up to £5k	This work has been completed
<b>C</b>	Tree trunks and branches that impede flow to be removed.	EA to be consulted regarding works in the Clanfield Brook	OCC to be consulted regarding potential road closure to complete work		WODC to provide coordination role	Riparian land owner on eastern bank to remove large sycamore tree which restricts flow.	Will increase channel capacity especially during flood flows.	Will transfer more water downstream	Up to £5k to remove tree	
<b>D</b>	Wooden fence to be replaced as uprights restrict flow. Potential to replace with fence to contain brook in bank	EA to be consulted regarding any works in the channel	OCC to replace fence with similar, structure less intrusive to channel. Potential to use some sort of sheeting which could be raised to the existing first parallel of fence in order to contain flood waters in channel on Black Bourton bends during times of flood		WODC to provide coordination role.		Will increase channel capacity	Will transfer more water downstream	£20k to £50k depending on material used	Further discussion and consultation required with OCC and EA
<b>E</b>	Widen the road where possible to prevent verges being pushed into the brook. Where this is not possible kerbing works should be undertaken to protect the road edge.		OCC to carry out kerbing works adjacent to driveway access to Chestlion Farm.		WODC to provide coordination role		Will prevent blockage of channel by verge collapse	Will transfer more water downstream	£20k to £50k	OCC have agreed to complete kerbing works
<b>F</b>	Maintenance of river banks and channel	EA to maintain river banks and channel			WODC to provide coordination role		Will prevent chocking of channel by weeds and maintain channel capacity	Will transfer more water downstream	Up to £5k	Clanfield Brook is part of the Radcot Cut system is a high risk designation and is cleared of vegetation every year by EA, generally in the autumn to clear summer growth.

Option ref	Flood Overview	Description of work required					Key issues			Comment
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private (riparian)	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 Parish Council: John Bowler: 01367 810 622 Alan Crisp: 01367 810 452					
<b>Area 2 – The Black Bourton Road between Calcroft Lane and Main Street (cont)</b>										
<b>G</b>	Existing walls on both sides of the watercourse to be repaired and replaced where necessary	EA to be informed on works to an enmained watercourse	OCC to replace the sandbagged wall on the road side of the Clanfield Brook with concrete to prevent collapse.		WODC to provide co-ordination role	Riparian owner to carry out repairs to stone wall on the eastern bank of the Clanfield Brook at Black Bourton Bends	Will reduce impediment to flow and increase channel capacity where walls have collapsed	Will transfer more water downstream	Up to £5k for repair to sandbagged wall. Up to £5k for repair to stone wall	OCC and riparian owners have agreed to complete this work
<b>H</b>	The tarmac pedestrian path to be repaired to prevent slippage into the Brook.	EA to be informed on works that may affect the watercourse	OCC to repair pedestrian path.		WODC to provide co-ordination role		Will prevent slippage of path into the watercourse and prevent blockage to flow	Will transfer more water downstream	Up to £5k	OCC have agreed to repair the path
<b>I</b>	Widening of the Brook, seek to use land at the bottom of gardens in Bourton Close.	EA to widen the Clanfield Brook in order to convey more flow.			WODC to provide co-ordination role	Riparian owners need to be consulted regarding land take	Will increase capacity of channel	Will transfer more water downstream	£20k to £50k	Further consultation required
<b>J</b>	Create a flood relief channel to link the Clanfield Brook and Marsh Lane ditch. This would require a sluice gate or similar structure to control flows and direct water away from the village when required.	EA to provide feasibility and carry out works			WODC to provide co-ordination role and find out land ownership details	Riparian owners have not been consulted.	Will allow water to be diverted away from the village during times of flood.	Will transfer more water to Marsh Lane area, potential for properties to be affected	£20k to £50k	Works to widen Marsh lane ditch and increase capacity of existing culverts under the Bampton Road would be required.
<b>K</b>	Flood resilient measures to properties in the 0.1% probability (1 in 1000 year floodplain)					Homeowners to provide flood protection to their properties e.g. flood boards, flood proofing of exterior walls.	Only effective if defences are put in place before the water level rises.	None	£500 to £5,000	EA website contains information regarding flood protection measures
<b>L</b>	Existing land drainage outfall draining marshy land to the north of Calcroft Lane to be blocked to remove substantial point flow from this land to the Clanfield Brook.				WODC to provide co-ordination.	Riparian owner to complete work.	Will reduce flows to Clanfield Brook and replicate the natural runoff more closely.	Will reduce drainage from farmland to the north. This land is already fallow as is too wet to farm using heavy machinery.	Up to £5k	Riparian owners have not been contacted regarding this option
<b>M</b>	Remove soil placed on banks of Clanfield Brook in farmland to the north of Calcroft Lane to the dismantled railway. Riparian owners have cleared the watercourse at this point and placed silt from the bed and banks on land adjacent to the brook preventing this land from acting as a natural floodplain				WODC to provide co-ordination role	Riparian owner to remove soil or create flood channels to allow water from the Clanfield Brook to flow onto the natural floodplain	Will allow water to use the natural floodplain and reduce flood levels in Clanfield	Will transfer more water onto the natural floodplain	Up to £5k	Riparian owners have not been contacted regarding this option.
	<b>Highway drainage and associated ditches</b>									
<b>N</b>	Kerb and stone edging to be constructed along this section of road to prevent vehicles from damaging verges and associated drainage.		OCC to complete kerbing work				Will limit damage to drainage by vehicles	Will prevent drivers mounting verges and improve land drainage	£5k to £20k	OCC have agreed to complete works
<b>O</b>	OCC to maintain the ditch located to the west of the highway at entrance to Chestlion Farm		OCC to carry out initial ditch clearance works as gesture of good will		WODC to provide co-ordination role and check land ownership/responsibility for ditch	Riparian owner are responsible for future ditch maintenance.	Will help to maintain condition of existing drainage ditches allowing water to pass freely	Improve land drainage	Up to £5k	OCC have agreed to carry out some drainage works in this area

Option ref	Flood Overview	Description of work required					Key issues			Comment
		Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private (riparian)	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 Parish Council: John Bowler: 01367 810 622 Alan Crisp: 01367 810 452					
<b>Area 2 – The Black Bourton Road between Calcroft Lane and Main Street (cont)</b>										
<b>P</b>	Increase capacity of culvert linking drainage ditches, under the Black Bourton Road to the Clanfield Brook at Chestion Farm		OCC to carry increase size of culverts under road				Will increase flow to Clanfield Brook	Improve land drainage, reduced local flooding due to backing up of culvert	Up to £5k	OCC have agreed to complete work
<b>Q</b>	Create an attenuation pond on land to the north of Calcroft Lane adjacent to Black Bourton Lane to attenuate overland flows and highway drainage from Black Bourton Lane		OCC will consider providing part funding		WODC to provide co-ordination role and find out land ownership details	Riparian land owners have not been consulted. Land is currently not farmed.	Will contain flood waters from Black Bourton Lane upstream and reduce flows to Clanfield Brook	Will require land take.	£5k to £20k feasibility £20k to £50k to construct	Further consultation required including assessments of upstream catchments to assess potential impact
	<b>BT Manhole</b> The BT Manhole located on Black Bourton Bends seeps water onto the road									
<b>R</b>	BT to carry out works on their manhole to prevent seepage of water – install a lateral drain linking to Clanfield Brook				WODC to provide co-ordination role	WODC have been talking with BT to highlight works required	Will remove problem	Will prevent flooding of Black Bourton Road during dry periods and remove danger to pedestrians and vehicles	Up to £5k	Further consultation required
<b>Area 3 – Main street</b>										
	<b>Clanfield Brook</b> The Clanfield Brook runs parallel to Main Street, and flooded numerous properties during July 2007.									
<b>A</b>	EA to lower the channel bed in Clanfield Brook running along Main Street from junction with Bampton Road to confluence with Broadwell Brook.	Ea to carry out de-silting of channel			WODC to provide co-ordination role		Will increase channel capacity and reduce potential flood risk	Will improve local land drainage	Up to £5k	The Clanfield Brook was de-silted by EA in 2003.
<b>B</b>	EA to maintain banks of Clanfield Brook	EA to carry out maintenance channel – weed removal			WODC to provide co-ordination role	Riparian owners to trim vegetation on banks of Brook	Will increase channel capacity during times of flood	Will contain flood waters in channel for longer and reduce flooding of surrounding land	Up to £5k	Clanfield Brook is part of the Radcot Cut system is a high risk designation and is cleared of vegetation every year by EA, generally in the autumn to clear summer growth.
<b>C</b>	Increase capacity of existing bridge crossings of Clanfield Brook. Where bridges can not be removed for historical reasons, flood relief culverts should be used.	Ea to provide advice on crossing sizes and consent to work in watercourse			WODC to provide co-ordination role	Riparian owner to carry out works in consultation with the EA	Will prevent backing up of water behind bridges	Reduce flood risk	£5k to £20k per bridge	Bridge crossings are very old and should not be removed – flood relief culverts should be used.
<b>D</b>	Flood resilient measures to properties in the 0.1% probability (1 in 1000 year floodplain)					Homeowners to provide flood protection to their properties e.g. flood boards, flood proofing of exterior walls.	Only effective if defences are put in place before the water level rises.	Potential to increase flood risk to adjacent property as flood water will be displaced	£500 to £5,000	EA website contains information regarding flood protection measures
<b>E</b>	Maintenance of existing road drainage, clearance of grips and jetting of gullies		OCC to carry out maintenance as per their existing schedule.				Improved land drainage		Up to £5k	
	<b>Foul sewer capacity exceeded.</b>									

F	Individual properties to be fitted with non-return valves on private foul connections					Residents to investigate/arrange fitting of anti-backflow protection  TW have consulted properties affected and provided anti backflow protection	Effective in preventing sewage flooding into properties via direct ingress through foul network connections		£500 to £5,000	Some properties already have used this measure
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## 7.0 CONCLUSIONS AND RECOMMENDATIONS

### 7.1 Area 1 – East of the Village, Bampton Road/Marsh Lane

#### 7.1.1 Maintenance

The following on-going maintenance is recommended:

- Riparian / private landowners to maintain field drainage ditches and Marsh Lane ditch as required - WODC to check that this has been done (Option G).
- OCC to check operation of the 2 culverts located under the Bampton Road (A4095) carrying surface water drainage to Marsh Lane (Option H).
- EA to carry out maintenance and lowering of bed in Black Boutton Brook from the crossing of the Bampton Road, north. Local landowners are willing to keep this work up to date if consent is provided by the EA (Option A).
- The southern section of the Black Bourton Brook to the floodplains will be de-silted by the EA in June/July 2008.

#### 7.1.2 Flood defence improvement schemes

##### Immediate (under 1 year)

- WODC removed tree and roots which reduced capacity in the existing small drainage ditch located parallel to the A4095 Bampton Road (Option E)
- Riparian owner to remove obstructions to flow in the drainage ditch running parallel to the Bampton Road (A4095) including the upsizing of the existing culvert under driveway access (photograph 3/4) (Option E)
- Riparian owners to increase capacity of first crossing of Marsh Lane ditch and remove the second. Further crossings need to be assessed. WODC to co-ordinate (Option G).
- OCC to lower bed of the bridge crossing to its original level on Black Bourton Brook at the Bampton Road (A4095) (Option C).
- At the exit of the Marsh Lane culvert under Bampton Road (A4095) OCC to re-construct the bank, bring side of the road to the correct height and install bollards to prevent slippage into the drainage channel (Option F)
- Homeowners to fit flood resilient measures to properties in the 0.1% (1 in 1000 year) floodplain (Option D)

##### Mid-Term (under 1 -2 years)

- Landowner to construct a drainage ditch on the western edge of his field boundary where the field adjoins the village (to the west of Black Bourton Brook). Soil that is removed will be placed on the village side of the ditch to act as a further protective barrier. This new ditch is to be fed into the existing drainage ditch located adjacent to the A4095 and flow through the existing piped culvert under the road to the Marsh land ditch (Option B).

##### Long-Term (3 years or more)

- OCC Highways to construct a bund at the entrance to Clanfield on the Marsh Lane junction with the Bampton Road (A4095). This may be in the form of a speed bump and will create a barrier to help control flow of water to the village, directing it to the Marsh Lane ditch instead. Feasibility to include street lighting requirements. (Option I).



## 7.2 Area 2 – The Black Bourton Road between Calcroft Lane and Main Street

### 7.2.1 Maintenance

The following on-going maintenance is recommended:

- EA to maintain river channel and banks (Option F)
- OCC to carry out initial ditch maintenance as good will gesture in the ditch located to the west of the highway at entrance to Chestlion Farm. Future maintenance is the responsibility of riparian owner. (Option O)
- Field access crossings at Bazeland Farm (photograph 14) should remain in place as they restrict flood flows and hold water upstream of Clanfield.

### 7.2.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

#### Immediate (under 1 year)

- EA to provide OCC with a consent to carry out de-silting works in the channel of the Clanfield Brook and lower the bed (Option A).
- The two wooden footbridges that cross the Clanfield Brook at Black Bourton Bends have been raised and re-structured to remove supports located in the channel (Option B).
- Tree trunks and branches that impede flow are to be removed (Option C)
- The wooden fence running along the banks of the Clanfield Brook to be removed and replaced with a structure that is less intrusive to flow and increase retention of the Brook (Option D)
- Repair tarmac footpath to prevent slippage into the Clanfield Brook (Option H).
- Property owners to provide and install flood protection for their properties e.g. flood boards, flood proofing, sand bags (Option K)
- Kerb and stone edging to be constructed to prevent vehicles from damaging verges and associated drainage (Option N)
- OCC to increase the size of existing culvert under Black Bourton Road linking drainage ditches to Clanfield Brook (Option P)
- BT to carry out works on their manhole to prevent seepage of water (Option R)
- High kerbing to be installed on banks of Clanfield Brook at Black Bourton Bends.

#### Mid-Term (under 1 -2 years)

- Widen the road where possible to prevent verges being pushed into the Clanfield Brook. Where this is not possible, kerbing works should be undertaken to protect the road edge (Option E).
- Existing walls (stone and sandbagged) on both sides of the Clanfield Brook to be repaired and replaced where necessary (Option G)
- Spring outfall to ditch on north of Calcroft Lane to be blocked to prevent point outfall and re-create natural slower catchment response. (Option P)
- Existing land drainage outfall draining marshy land to the north of Calcroft Lane to be blocked to prevent discharge to Clanfield Brook (Option L).
- Riparian owner to allow Clanfield Brook (to north of Calcroft Lane to the dismantled railway) to flood onto natural floodplain by removing recently excavated soils currently located on banks of Clanfield Brook (Option M).

#### Long-Term (3 years or more)

- Widen the Clanfield Brook, seek to use land at the bottom of gardens in Bourton Close (Option I)
- Create flood relief channel to link the Clanfield Brook and Marsh Lane ditch (Option J)
- Create attenuation pond at end of highway ditches on Black Bourton Road using land north of Calcroft Lane (Option Q).

### 7.3 Area 3 –Main Street

#### 7.3.1 Maintenance

The following on-going maintenance is recommended:

- OCC to continue maintenance of existing highway drainage system along Main Street (Option E).
- EA to increase maintenance of bed and banks of Clanfield Brook along Main Street (Option B)

#### 7.3.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

##### Immediate (under 1 year)

- EA to de-silt the channel in the Clanfield Brook and lower the bed from junction with Bampton Road to confluence with Broadwell Brook (Option A)
- Property owners to provide and install flood protection for their properties e.g. flood boards, flood proofing, sand bags (Option D)
- Residents to investigate potential for fitting of non-return valves on private foul connections (Option F)

##### Mid-Term (under 1 -2 years)

- Increase the capacity of existing bridge crossings at driveway access points along Main Street. Where they are restrictive, flood relief culverts should be used (Option C)

## **Appendix I: Photographs**

**Area 1: East of the Village, Bampton Road/Marsh Lane**

Photograph 1: Bampton Road at Clanfield looking towards Main Street with Marsh Lane on the left.



Photograph 2: Marsh Lane Ditch looking away from Bampton Road.



**Area 1: East of the Village, Bampton Road/Marsh Lane (Cont...)**

Photograph 3: Bampton Road drainage channel opposite Marsh Lane. The photograph shows the small ditch following clearance by OCC but prior to removal of the tree whose roots block the culvert. This has since been completed by WODC.



Photograph 4: Bampton Road drainage channel opposite Marsh Lane. This photograph was taken following works by WODC to remove the tree.



**Area 2: The Black Bourton Road between Calcroft Lane and Main Street**

Photograph 5: The Clanfield Brook at Black Bourton Bends



Photograph 6: The Black Bourton Bends in flood, July 2007.



**Area 2: The Black Bourton Road between Calcroft Lane and Main Street (cont...)**

Photograph 7: BT Manhole leaking at Black Bourton Bends



Leaking BT manhole

Photograph 8: BT manhole at Black Bourton Bends and drainage ditch at end of Chestlion Farm



Leaking BT manhole

OCC to complete initial ditch maintenance and increase culvert size under road. Riparian owners are responsible for future maintenance.

**Area 2: The Black Bourton Road between Calcroft Lane and Main Street (cont...)**

Photograph 9: Drainage ditch at end of Chestlion Farm on Black Bourton Bends



OCC to complete initial ditch maintenance and increase culvert size under road. Riparian owners are responsible for future maintenance.

Photograph 10: Spring located to the north of Calcroft Lane flowing to Clanfield Brook



Land drainage outfall on north of Calcroft Lane



**Area 2: The Black Bourton Road between Calcroft Lane and Main Street (cont...)**

Photograph 11: Broadwell Brook at Clanfield Mill



Photograph 12: Clanfield Brook running parallel to Calcroft Lane upstream of Black Bourton Bends



**Area 2: The Black Bourton Road between Calcroft Lane and Main Street (cont...)**

Photograph 13: Clanfield Brook upstream of Black Borton Bends  
This photograph shows restrictions in the upstream catchment near to Bazeland Farm



Photograph 14: Clanfield Brook running parallel to Calcroft Lane  
This photograph shows farm access restrictions to flow near to Bazeland Farm



**Area 3: Main Street**

Photograph 15: Main Street Clanfield, July 2007



Photograph 16: Clanfield Brook, Main Street

This photograph shows the bridge restrictions on the Clanfield Brook at Main Street



Surcharged bridge crossings

**Area 3: Main Street (cont...)**

Photograph 17: Main Street Clanfield July 2007



Photograph 18: The Granary, Main Street Clanfield

