



WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report: **Broadwell & Kencot**

July 2008

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



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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 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 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.

1.4 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.

1.5 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

Flood Grants

- 28 WODC Flood Grants (9 for Broadwell and 19 for Kencot) totalling £7,000 given out overall (£2250 for Broadwell and £4750 for Kencot)
- 2 Red Cross Flood Grants totalling £9,268 administered by WODC overall

Reports

- Environment Agency Flood Review published (TBA)
- WODC Parish Flood Report for Broadwell & Kencot completed in June 2008.

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 the Emergency Plan recognises the role the elected members can play in emergency and recovery situations |
| 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 early in 2008 to progress this |
| Progress the Strategic Flood Risk Assessment |
| Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances |
| Approaches to be made to the EA and Metrological Office with regard to improving their predictive capability |
| 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 |
| 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 villages of Boardwell & Kencot and has been prepared by the Council's Engineering team. It pulls together information from external agencies and individual property owners. It identifies the causes of flooding in Broadwell & Kencot during July 2007 and potential mitigating solutions.

The report itself is broken down into a number of sections and will include;

- An overview of flooding history in Broadwell & Kencot and flood related issues raised by residents
- A presentation of the problems and causes of flooding in Boardwell & Kencot during July 2007.
- A summary of all the flooding issues and potential mitigation options.
- A breakdown of the recommendations for immediate, mid-term and long term actions including the responsibly agency based on the options identified.

The table below provides a summary of some of the main causes of the flooding in Broadwell & Kencot and the mitigation options that could be applied to alleviate the different flooding problems. More detail is provided regarding the specific locations and the causes of flooding in section 5 of the report.

| Source of flooding | Potential mitigation measures |
|--|---|
| Insufficient culvert capacity through the village of Kencot. | Provide upstream balancing pond. |
| Blockages in the Kencot culvert and Boardwell highway drain. | Clear/ maintain culvert and highway drainage. |
| Blocked gullies at Broadwell village. | Clear and maintain gullies on a regular basis. |
| Poor routing of culvert/ open channel through the village of Kencot. | Divert culvert/ open watercourse away from village. |
| Under capacity combined sewer surcharging in the village of Kencot. | Provide new surface water sewer and remove storm connections from the combined sewer. |
| Poor alignment and constrictions within Kencot Bottom watercourse. | Re-align, divert or widen watercourse/ remove ornamental garden bridge crossings. |
| Under capacity road bridge crossing. | Provide new box culvert highway bridge crossing. |

4.0 SURVEY

4.1 Description of area

The villages of Broadwell & Kencot together form two parishes of approximately 675 Hectares (1668 acres) in size. The parishes are rural in nature forming part of the catchment area for the River Thames via Great Brook, Radcot Cut, Langhat Ditch and Broadwell Brook.

The parishes are located between Langhat Ditch to the east, Broadwell Brook to the south, the Parish of Filkins & Broughton Poggs to the west, the A361 Burford to Lechlade trunk road to the west and Broadwell Grove to the north. Langhat Ditch and Broadwell Brook are Enmained ditches (form part of the Main River system)

The area has a significant number of springs, where underground water emerges. One such spring rises just north of Kencot and flows into a culvert to the east of Hillview Farm just north of the B4477.

There are five farms (Kencot Hill Farm, Hillview Farm, Home Farm, Asthall Farm, and Lower Farm), two churches, a plantation, a quarry and a tennis club located within the parishes.

4.2 Survey approach

Visual walk-over surveys have been undertaken. Photographs of some of the flood affected areas are in Appendix I.

A review of all correspondence, received by the Council about the July 2007 flooding in the Parish of Broadwell and Kencot, has been carried out and incorporated within the findings of the report.

4.3 Meetings

Details of key meetings attended by District Council representatives about the flooding of Broadwell and Kencot in July 2007 are given in Table below;

| Date | Main participants and Venue | Description |
|-------------|--|---|
| 29/11/07 | Lt Col J.Barstow (Kencot Parish Council Chairman), Kencot House. | Discussed concerns, issues and solutions directly relating to flooding of properties in Kencot. |
| 14/04/08 | Lt Col J.Barstow (Kencot Parish Council Chairman) and Mr A.Molyneux (Kencot Parish Council Clerk), Kencot village. | Discussed concerns, issues and solutions directly relating to flooding of properties in Kencot. |
| 15/04/08 | Mr M.Godfrey (Broadwell Parish Council Chairman), Dodges Cottage. | Discussed concerns, issues and solutions directly relating to flooding of properties in Broadwell. |
| 24/04/08 | Broadwell Parish Council Meeting, Broadwell Village Hall. | Discussed flooding in relation to cause, affect and possible solutions to mitigate flooding in Broadwell and Kencot. Discussed WODC's production of Parish Flood Report. |

The District Council has liaised with the Environment Agency, Oxfordshire County Council and Thames Water. The Environment Agency has carried out visual surveys of the flooded areas affected by the main river.

The District Council has contacted some of the owners of properties that flooded in July 2007. Some residents of Kencot Parish also procured the qualified services of "Water Resource Associates", who undertook a detailed analysis of the causes and potential solutions, of the flooding problems experienced by Kencot Parish. Some of their findings have been included in this report but only as support to WODC proposals.

4.3.1 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

To date the owners of 28 residential properties in the Parishes of Broadwell and Kencot (9 for Broadwell and 19 for Kencot) have received Emergency Flood Relief Grant Aid, however it is acknowledged that this is not the total number of properties affected 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.

4.3.2 Flooding History

From discussions with local residents it was noted that the parishes of Broadwell and Kencot, particularly the area around the Kencot Bottom Highway Bridge, flooded at least six times in the last 44 years.

5.0 PROBLEMS AND CAUSES

5.1 Plans

Figure 1 below is a map showing areas in Broadwell & Kencot where flooding occurred in July 2007.

Appendix 2 contains a single map showing:

- **Broadwell & Kencot Parish boundary**
- **Environment Agency** - main rivers and enmained water courses in the area.
- **Flood Zone 2, January 2008** - 0.1% annual probability of flooding occurring or low to medium risk. Previously referred to as 1:1,000 year flooding.
- **Flood Zone 3, January 2008** - 1% annual probability of flooding occurring or high risk. Previously referred to as 1:100 year flooding

Note – this EA map has been updated to reflect the events of July 2007. All references to flood zones in this report refer to the previous EA flood zone map i.e. pre July 2007.

5.2 Area 1 – Broadwell to Kencot Thoroughfare

Eight properties flooded in July 2007, either side of the Kencot to Broadwell Thoroughfare, from the B4477 Broughton Poggs to Carterton junction to Asthall Farm.

Flooding originated from an open watercourse running from the northern side of “Kencot House” before being culverted under the village of Kencot (from “Kencot House” to the side of a property called “Ivy Nook”). Flooding was/will be attributable to either or a combination of the following: (i) insufficient capacity of the culvert. (ii) Lack of maintenance to the culvert. (iii) The new combined sewer, which is currently being installed by Thames Water to run under the village, to take 1 in 30 year events. will be unable to cope with a significant increase in discharge caused by events similar to those of July 2007.

The cause of flooding is the following:

5.2.1 Excess overland flow caused by culvert surcharging north of “Kencot House”

Large volumes of flood water discharge across and through “Kencot House” to flood properties downstream either side of the Broadwell to Kencot Thoroughfare.

5.2.2 Culvert blockage, collapse or tree root obstruction

Soft blockages, siltation, structural failure, unlikely obstructions or tree root ingress obstructing the clear flow path within the culvert between “Kencot House” and “Ivy Nook”.

5.2.3 Under-sized culvert between “Kencot House” and “Ivy Nook”

Under-capacity and poorly located culvert running from “Kencot House” to “Ivy Nook”. The culvert is located through housing development in Kencot which gives rise to a risk of flooding, to properties located along its footprint, during peak rain storm events.

5.2.3 Combined Sewer

Excess surface water will reach the newly constructed combined sewer, which will run under the villages of Broadwell and Kencot, to the newly constructed pumping station and rising main.

Thames Water are currently installing a pumping station, to the rear of the “Chilli Peppers” Public House (formerly known as the Five Bells) and rising main to discharge into an existing sewer running under the B4477.

5.3 Area 2 – Kencot Bottom Highway Bridge

Fourteen properties were flooded in the Kencot Bottom Highway Bridge area in July 2007.

This was caused by any or a combination of the following: (i) Crooked “dog-leg” alignment of Kencot Bottom as it passes to the rear of Manor Farm and Manor Cottage. (ii) Restricted opening under the bridge leading to surcharging upstream. (iii) Restricted opening leading to surcharging under the small bridge located in the garden of Manor Farm. (iv) Narrow channel along Kencot Bottom downstream of the bridge.

5.3.1 Crooked alignment of Kencot Bottom

Severe “dog-leg” alignment of Kencot Bottom leads to water turbulence, surcharging and overspill adjacent to the garden of “Manor Cottage”. At full flow the sharp deflection in alignment of Kencot Bottom leads to flooding of adjacent property.

5.3.2 Restricted opening at Highway Bridge

The road bridge has insufficient capacity during peak storms with water surcharging several times a year. In addition, the bridge is in poor condition with blocks of masonry missing and a low soffit on the downstream side.

5.3.3 Restricted opening under bridge in garden of Manor Farm

An ornamental bridge in the garden of Manor Farm has insufficient clearance to avoid surcharging upstream and adjacent flooding.

5.3.4 Narrow channel downstream of Highway Bridge

The channel of Kencot Bottom is reduced in width downstream of the highway bridge arising to insufficient clearance for the free flow of water. As in 4.3.3 this leads to surcharging upstream and adjacent flooding.

5.4 Area 3 – Kings Lane

Four properties were flooded at the junction of the Broadwell to Kencot thoroughfare and Kings Lane in July 2007.

This was caused by any or a combination of the following: (i) Blocked highway drain running under the field south of “Dodges Cottage”, (ii) Blocked gullies and open channel at the carriageway edge opposite “Sunnyside”, (iii) Under-sized highway drain to replace (i) above.

5.4.1 Highway drain blockage or tree root obstruction

Soft blockages, siltation or tree root ingress obstructing the clear flow path within the highway drain understood to be located to the rear of “Dodges Cottage”.

5.4.2 Highway drain structural failure or under capacity

Structural failure or under capacity of the highway drain understood to be located to the rear of “Dodges Cottage”.

5.4.3 Localised obstructions and blockages to highway drainage

There are alleged numerous and repetitive blockages to gullies and connections located at the head of Kings Lane on the Broadwell to Kencot thoroughfare. Additionally an open channel opposite “Dodges Cottage”, “Newmans Cottage” and “Sunnyside” is overgrown and silted up. This obstructs the clear run-off of highway drainage.

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.

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 (6.0).

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.

West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Broadwell & Kencot

June 2008

| Option ref | Problem overview | Description of work required | | | | | Key issues | | | Comments |
|--|--|---|--|--|---|--|--|--|----------------|-----------------|
| | Options | Environment Agency | Oxfordshire County Council | Thames Water | WODC | Private/ Riparian | Effectiveness | Effects on adjacent land | Cost | |
| | | For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk | For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk | For queries Tel: 08459 200800 | For queries Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk | Broadwell & Kencot Parish Council | | | | |
| Area 1 – Broadwell to Kencot Thoroughfare | | | | | | | | | | |
| | Eight properties flooded – estimated frequency every 10 to 20 years. <u>Primary causes</u> - (i) Insufficient capacity of the culvert under Kencot thoroughfare. (ii) Lack of maintenance to the culvert. (iii) The new combined sewer (which is currently being installed by Thames Water to run under the village) will be unable to cope with a significant increase in discharge caused by events similar to those of July 2007. | | | | | | | | | |
| Action 1 | Provide balancing pond north of “Kencot House” to attenuate flow prior to entering the culvert under Kencot. | EA to undertake this work to protect properties fronting the thoroughfare. The existing pond north of “Kencot House” is to be dredged and tributaries cleaned out. EA to carry out flood risk mapping of the Main River. EA comments required. | | | WODC to co-ordinate works with this proposal. | | Provides 1 in 100 year flood protection. | Requires land to the rear of “The Old Rectory” and “Kencot House” to construct balancing pond. | £100k to £500k | |
| Action 2 | Locate, jet out and clear tree routes within culvert under Kencot between “Kencot House” and the side of “Ivy Nook”. | | OCC to undertake this work in conjunction with Thames Water. OCC comments required. | Thames Water in conjunction with OCC to undertake this wall. (Thames Water comments received) | WODC to co-ordinate works with this proposal. | | Provides protection to properties fronting the Broadwell to Kencot thoroughfare. | | £5k to £50k | Adopted culvert |
| Action 3 | Divert watercourse from Kencot to the west of “Dovecote Barn” crossing under the B4477 to the west of “The Old Rectory”. Construct open watercourse from crossing to St Georges Church to meet Kencot Bottom at “Ivy Nook”. | EA to provide discharge consent into Kencot Bottom. + diversion consent | OCC to undertake this work. OCC comments required. | | WODC to co-ordinate works with this proposal. | Requires agricultural land take (owners TBA). Agreement required between with OCC to undertake the work. | Provides protection to properties fronting the Broadwell to Kencot thoroughfare. | Requires wayleave and access rights to construct new culvert under adjacent property. | £100k to £500k | |

West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Broadwell & Kencot

June 2008

| Option ref | Problem overview | Description of work required | | | | | Key issues | | | Comments |
|--|---|---|--|--|---|--|--|--|----------------|----------|
| | Options | Environment Agency | Oxfordshire County Council | Thames Water | WODC | Private/ Riparian | Effectiveness | Effects on adjacent land | Cost | |
| | | For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk | For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk | For queries Tel: 08459 200800 | For queries Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk | Broadwell & Kencot Parish Council | | | | |
| Action 4 | Provide new surface water tank sewer under Kencot thoroughfare between "Kencot House" and "Ivy Nook". Highway, roof, driveway and yard drainage to be connected to new sewer thus changing the status of combined sewer to foul only. Thames Water to make adjustments to each property as required. | | | Thames Water is to undertake this work. Thames Water comments required | WODC to co-ordinate works with this proposal. | Thames Water to serve notice on all land owners to gain access as required. | Provides 1 in 30 year flood protection as per "Sewers for Adoption". | Notice to be served on all land owners if required to gain access. | £100k to £500k | |
| Area 2 - Kencot Bottom Highway Bridge | | | | | | | | | | |
| | Fourteen properties flooded – estimated frequency every 1 to 5 years. <u>Primary causes</u> - (i) Insufficient capacity of road bridge to allow the free passage of water under during peak storms. (ii) Poor condition of road bridge with a low soffit level and spalling masonry. (iii) Crooked alignment of Kencot Bottom watercourse at the approach to the bridge. | | | | | | | | | |
| Action 1 | Realign Kencot Bottom adjacent to Manor Cottage in open watercourse or twin pipes. | EA to approve size of culverts if this option is preferred over an open watercourse. EA comments required. | | | WODC to co-ordinate works with this proposal. | Work to be undertaken in either open cut watercourse or twin pipes depending on agreement between the EA, The National Trust and Roger Goodenough (owner of Manor Cottage). The National Trust to wholly fund the works. | This option will prevent flooding of "Manor Farm" and "Manor Cottage" gardens/ driveway etc. | Work to be undertaken on private land. | £5k to £50k | |
| Action 2 | Provide a new box culvert highway bridge in place of the existing crossing of Kencot Bottom. | EA to confirm to OCC size of box culvert. EA comments required. | OCC to undertake this work and provide full funding. OCC comments required. | | WODC to co-ordinate works with this proposal. | Work is to be undertaken and funded wholly by OCC. | This option will prevent surcharging and flooding of "Manor Farm" and adjacent properties | | £100k to £500k | |

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| Option ref | Problem overview | Description of work required | | | | | Key issues | | | Comments |
|----------------------------|---|--|---|----------------------------------|---|---|---|--|--------------|----------|
| | Options | Environment Agency | Oxfordshire County Council | Thames Water | WODC | Private/ Riparian | Effectiveness | Effects on adjacent land | Cost | |
| | | For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk | For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk | For queries Tel: 08459 200800 | For queries Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk | Broadwell & Kencot Parish Council | | | | |
| Action 3 | Remove and re-build small bridge in the garden of Manor Farm with a higher soffit level. | The EA is to advise the private land owner, and serve notice, regarding replacement of the bridge. | | | WODC to co-ordinate works with this proposal. | Work to be undertaken and funded wholly by the private land owner. The EA is to serve notice on the private land owner. | This option will improve the flow capacity of Broadwell Brook and reduce surcharging. | Work to be undertaken on private land. | £5k to £50k | |
| Action 4 | Widen the channel of Broadwell Brook on the left bank downstream of the bridge for ten meters. | The EA is to undertake and wholly fund this work. EA comments required. | | | WODC to co-ordinate works with this proposal. | | This option will improve flow capacity of Broadwell Brook and reduce surcharging. | Work to be undertaken on private land. | £5k to £50k | |
| Area 3 – Kings Lane | | | | | | | | | | |
| | Four properties flooded – estimated frequency every 10 to 20 years. <u>Primary cause</u> - insufficient and ineffective highway drainage outside “Dodges Cottage”, “Newmans Cottage” and Sunnyside” | | | | | | | | | |
| Action 1 | Locate, jet out and clear tree routes within the highway drain located to the south of “Dodges Cottage”. | | OCC to undertake this work. OCC comments required. | | WODC to co-ordinate works with this proposal. | Work to be undertaken and funded wholly by OCC. | Alleviates local flooding but is not effective in extreme events. | | £5k to £50k | |
| Action 2 | Provide a highway drain to the south of “Dodges Cottage” discharging to the same existing watercourse. | EA to confirm extent of allowable discharge. EA comments required | OCC to undertake this work. OCC comments required. | | WODC to co-ordinate works with this proposal. | Work to be undertaken and funded wholly by OCC. | | Requires wayleave across agricultural land south of “Dodges Cottage” | £5k to £50k. | |

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Broadwell & Kencot

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| Option ref | Problem overview | Description of work required | | | | | Key issues | | | Comments |
|------------|--|---|---|---|--|-----------------------------------|-------------------------------|--------------------------|------------|----------|
| | Options | Environment Agency | Oxfordshire County Council | Thames Water | WODC | Private/ Riparian | Effectiveness | Effects on adjacent land | Cost | |
| | | For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk | For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk | For queries Tel: 08459 200800 | For queries Tel: 01993 861000 or e-mail enquiries@westoxon.gov.uk | Broadwell & Kencot Parish Council | | | | |
| | | | | | | | | | | |
| Action 3 | Clear out the open channel, gullies and jet connections outside “Dodges Cottage”, “Newmans Cottage” and “Sunnyside”. | | WODC to undertake and co-ordinate works with this proposal. (OCC comments required) | | WODC to undertake and co-ordinate works with this proposal. | | Effective localised solution. | | Up to £5k. | |

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Area 1 – Broadwell to Kencot Thoroughfare

7.1.1 Maintenance

The following on-going maintenance is recommended:

- Action 2 – EA in conjunction with Thames Water are to locate, jet out and clear tree routes within the culvert under Kencot village between “Kencot House” and the side of “Ivy Nook”. OCC are to empty gullies and later pipes on a regular basis 2/3 times a year to ensure free discharge of highway drainage.

7.1.2 Flood defence improvement schemes

The following flood defence improvement scheme recommended:

Mid-Term (under 1 -2 years)

- Action 1 – EA to provide a balancing pond with outlet control on land to the north of “Kencot House”. This will enable flow to be attenuated, prior to entering the culvert under Kencot, and limit the risk of downstream flooding through control of the upstream catchment area run-off. A balancing pond will receive high volumes of discharge at high rates of flow and throttle discharge to a low level.

7.2 Area 2 – Kencot Bottom Highway Bridge

7.2.1 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Action 1 – The National Trust is to undertake realignment of Kencot Bottom adjacent to Manor Cottage. Realignment is to be carried out in open watercourse or twin pipes. The National Trust is to fund all works and the EA is to confirm the size of culverts if this sub-option is recommended.
- Action 3 – The National Trust is to Remove and re-build the small bridge in the garden of Manor Farm, with a higher soffit level.

Mid-Term (under 1 -2 years)

- Action 2 – OCC are to provide a new box culvert highway bridge in place of the existing crossing of Kencot Bottom.
- Action 4 – The EA is to widen the channel of Broadwell Brook on the left bank downstream of the bridge.

7.3 Area 3 – Kings Lane

7.1.1 Maintenance

The following on-going maintenance is recommended:

- Action 1 – The EA in conjunction with OCC are to locate, jet out and clear tree routes within the highway drain located to the south of “Dodges Cottage”.
- Action 3 – OCC to clear out the open channel, gullies and jet connections outside “Dodges Cottage”, “Newmans Cottage” and “Sunnyside”.

Appendix I: Photographs



Kencot Church (area 1)



Ivy Nook, Kencot (area 1)



Imposed drainage sign, Broadwell (area 1)



Kencot Green (area 1)



Watercourse adjacent to Kencot Manor (area 1)



Culvert outlet watercourse at Ivy Nook, Kencot (area 1)



Kencot Cottages (area I)



Water being pumped out of properties in Kencot (area I)



Highway drainage Kencot to Broadwell (area I)



Kencot southern approach (area I)



Watercourse north of Kencot House (area I)



Highway drainage outside Kencot (area I)



Watercourse outlet to culvert mouth, Kencot House (area I)



Kencot House (area I)



Greystone, Kencot (area I)



Highway drainage culvert vent in Kencot (area I)



Highway drainage culvert vent in Kencot (area I)



Kencot southern approach (area I)



Kencot Bottom near Manor Farm (area 1)



Recently dredged water, rear of Kencot cottages (area 1)



Watercourse junction with Kencot Bottom (area 1)



Dredged debris, Kencot (area 2)



Cottages north east of highway bridge (area 2)



Cottage north-west of highway bridge (area 2)



Manor Farm - National Trust (area 2)



Kencot Bottom between Mulberry cottage and Manor cottage (area 2)



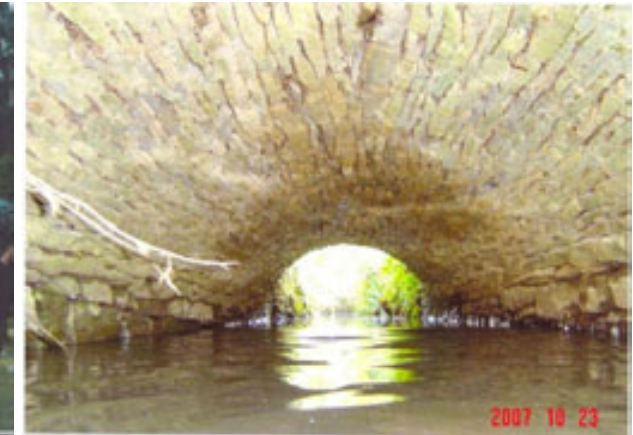
Kencot Bottom highway bridge (area 2)



January 2003 Flooding - Cote House (area 2)



January 2003 Flooding - Brookside (area 2)



July 2007 Flooding - Kencot Bottom bridge (area 2)



July 2007 Flooding - Bridge Cottage (area 2)



July 2007 Flooding - Cote House (area 2)



January 2003 Flooding - Manor Cottage (area 2)



July 2007 Flooding - Holly Cottage (area 2)



July 2007 Flooding - Brookside (area 2)



July 2007 Flooding - Mulberry Cottage (area 2)



Ditch opposite Sunnyside, Broadwell (area 3)



Kings Lane, Broadwell (area 3)



Route for proposed highway drain in Broadwell (area 3)



Broadwell Church (area 3)



Sunnyside, Broadwell (area 3)



Dodges Cottage, Broadwell (area 3)



The Old Manor, Broadwell (area 3)



Old Pump on ditch opposite Sunnyside, Broadwell (area 3)



Blocked gullies outside Newman cottage, Broadwell (area 3)