WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report: Hanborough

August 2008

Contents

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 powers[1] 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[2] land owner, and permissive powers[1] under Land Drainage Act 1991, Public Health Act 1936, Highways Act 1980 and Environmental Protection Act 1990.

Private land owners - duties as a riparian land owner.

1.3 Consultation and consent

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

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

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

1.4 Response to this report

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

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

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

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

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

1.5 Legal

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

Flood Grants

- WODC Flood Grants totalling £250.00 given out.

Reports

- WODC Parish Flood Report for Hanborough completed in August 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

3.1 General

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 Hanborough 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 Hanborough 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 Hanborough and flood related issues raised by residents
- A presentation of the problems and causes of flooding in Hanborough 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 Hanborough 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
Land and highway drainage capacity over-loaded by run-off from fields surrounding the village of Long Hanborough	Provide upstream balancing ponds, at locations to be determined.
Blockages in the Long Hanborough culverts.	Clear/ maintain culverts and highway drainage.
Blocked gullies at Long Hanborough village.	Clear and maintain gullies on a regular basis.
Landform and ground conditions at Riely Close	Provide a submersible pump to force the highway runoff back out of the cul-de-sac
Design and location of landfill site access on Lower Road	Provide additional culverts to re-direct excess water

3.2 SURVEY

3.2.1 Description of area

The Parish of Hanborough is approximately 869 Hectares (2146 acres) in size.

Hanborough lies mainly on a small hill to the North and East of Witney on the main A4095 trunk road. The Parish comprises mainly of agricultural land to the north and south of this highway. The main populated area is situated alongside the highway, and is known as Long Hanborough. Less than a kilometre along the highway heading east, there is a junction with Church Road connecting Long Hanborough with Church Hanborough, a smaller conurbation approximately a kilometre to the south. The area was once ancient farmlands dating back to William the Conqueror and has supported a clay brick industry, saw mills, and gravel pits in the more recent past as well as livestock and crops.

The main Evenlode River flows around Hanborough from the north-west in a clockwise direction to the south where it continues on through Eynsham to the River Thames. A Critical Ordinary Watercourse, the Caverswell Brook, flows from the north-west in an anticlockwise direction through the parish and is culverted beneath Lower Road to the southern most part prior to discharging into the Evenlode.

The main Railway line from Oxford to Hereford traverses the Evenlode valley at the eastern end of the village crossing the highway via a cutting under the main A4095. Half a kilometer east of the railway cutting, the Evenlode too, crosses beneath the A4095.

All roads entering / leaving the parish do so from relatively low lying areas which historically form flood plains for the watercourses flowing around it.

3.2.2 Survey approach

Visual walk-over surveys have been undertaken. Photographs of some of the flood affected areas are in Appendix 1.

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

3.2.3 Meetings

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

Date	Main participants and Venue	Description
23/07/08	Meeting and site visit by Jeff Mason, Consultant Engineer with Peter Britten, Parish Chair, Frances Hancox, Parish Finance Officer and residents affected by flooding in Hanborough Parish	Discussions with the parishioners regarding the probable causes of floods and their effects on the community.

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.

3.2.4 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

To date the owners of 1 residential property in the Parish of Hanborough 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.

3.2.5 Flooding History

Flooding to property in the parish does not occur on a regular basis because of its elevation but in recent extreme rainfall events flood waters have entered one property and have come close to entering others.

4.0 PROBLEMS AND CAUSES

4.1 Plans

Appendix 2 contains three map showing:

Figure 1 – Areas of flooding in Hanborough in July 2007

Figure 2 – A single map showing;

- **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.

4.2 Causes of Flooding

Flooding to the A4095 at both east and west ends of the village and to Lower Road at the Caverswell Brook culvert occurs on a regular basis causing concern to residents, delays to commuters and could present risk to life through delays to emergency services or by vehicle accidents. Heavy flooding has also been reported in Riely Close, a small cul-de-sac adjacent to the Methodist Church falling in level, several metres in elevation, away from the main road.

4.2.1 Area 1 – Witney Road, A4095 Western Approach

One property on Witney Road, Hanborough was badly flooded in July 2007 resulting in it being unoccupiable for several months. The property is situated on the western perimeter of the village on the A4095. This is a natural low point of the highway and highway drains fall towards this low point from the east and west. A large rural catchment to the north and north-west of the highway falls towards this same point forming the beginning of the Caverswell Brook. This rural catchment supports several under ground springs which indicate that a perched aquifer may exist beneath this area of land. There are several ponds along the northern edge of the carriageway and to the west of the low point which are continuously full suggesting that these are probably fed by the underground springs. There is a smaller pond further north of these on higher ground which is also water bound throughout the year indicating that the water table in this area is very high.

The cause of flooding is the following;

4.2.2 Run-off from the fields exceeds the capacity of the highway drainage system

During heavy rainfall, runoff from this rural catchment combines with runoff from the highway ditches and piped drains culminating at the low point close to and opposite the flooded property on Witney Road. Then it crosses beneath the highway through a series of relatively small diameter piped culverts and discharges into a ditch approximately 50 metres away in a field to the south. This field is a sizeable rural catchment, which also slopes down towards the low point from the west, culminating approximately 20 metres away from the flooded property on the south side of the highway.

In July 2007, rainfall intensities were such that the quantities of runoff arising from the rural and highway catchments flowed into the Witney Road property from the highway and from the fields to the west of the

property. The highway drainage system is overwhelmed by this amount of water and requires regular maintenance to clear debris from gullies and pipes to be effective at all. The ditches to the north and south of the highway fill quickly; the north ditch surcharging the highway culvert and the highway drainage system, causing overflows into the carriageway. Once water levels in the highway reach several centimeters in depth, water breaches the drop kerbs at the property accesses and floods the property.

4.3 Area 2 – Riely Close

From observation and anecdotal evidence it is apparent that runoff from Main Road and from Hanborough Manor CE School accumulates at the bottom of the cul-de-sac and ponds to a depth of several centimeters. The school catchment area is comprised of roofs, car parks and access roads. It is uncertain whether any discharge from the school playing fields flow towards the cul-de-sac, this requires further investigation.

The causes of flooding are as follows;

4.3.1 Highway runoff

Runoff from Witney Road and Hanborough Manor CE School floods the roads in Riely Close.

4.3.2 Landform and ground conditions

This area is a low point created by gravel works which were located here historically. The gravel now removed, has left a dense heavy clay layer which prevents natural infiltration to any useful extent. To the south of the cul-de-sac, the ground rises steeply to a height of approximately three metres above road level and forms a natural barrier to flows from the cul-de-sac. The water therefore becomes trapped in the cul-de-sac.

4.4 Area 3 – Eastern Perimeter of the A4095, Witney Road

Flooding regularly occurs at the junction of the A4095 and Lower Road to the east of the village.

The causes of flooding are as follows;

4.4.1 A combination of highway and rural runoff

The main highway slopes from the village down to this point quite steeply for several hundred metres. Lower Road is also mainly higher than the junction although the gradient is not so apparent. Fields to the north and north-west of the A4095 tend towards the Evenlode River at this point but some runoff from them will flow onto the highway through the field boundary gates and from the highway ditches once the highway ditches at the base of the slope are full.

4.4.2 Design of highway drains

The highway drains through the junction are running very flat and are probably designed to discharge to the ditches on the south of the main highway and east of Lower Road. It is likely that the head pressure created in the highway drains by the runoff higher up the A4095 to the west and over-ground flows from the east part of the A4095 and Lower Road will surcharge the system at the junction to the point where water will be forced out of the drains back onto the carriageway.

4.4.3 Blocked highway gullies

It has been observed that highway gullies at the Evenlode Bridge to the north channel of the highway are blocked and heavily vegetated and are likely to be a contributing factor in the flooding.

4.4.4 Landform around the Railway Bridge

To the west of the Lower Road / A4095 junction at a higher elevation is the bridge over the railway. On the western approach of this bridge, 'Ponding' occurs during rainfall events. Even events of a moderate nature can cause the system to flood at this point. The Witney Road approach here is in a depression between the highway to the west and the railway bridge hump. The depression is bounded to the north by the stone wall of a pumping station and to the south by an embankment. Water collects in this depression due to overloading of the highway drainage system. It is probable that blockages of gullies and pipes are responsible for the ponding. It is uncertain where the highway drain discharges from this point and this requires further investigation.

4.5 Area 4 - Southern Perimeter, Lower Road

The Caverswell Brook crosses Lower Road via a 2 metre wide concrete box culvert approximately 2 km south of the A4095 junction. The Brook catchment to the north, south and west of this culvert is expansive and includes open fields and woodlands. A hedgerow and drainage ditch runs north to south along both sides of Lower Road to the north of this culvert and south to north along both sides of Lower Road to the south of it.

The cause of flooding is as follows;

4.5.1 Design and location of the Landfill Site access on Lower Road

The access to a new landfill site is situated adjacent to the culvert and to the south and west of it. It has been necessary to remove hedgerows and ditches to provide this access. The access comprises flexible asphalt paving and a plastic 450mm diameter drain has been installed beneath the paving to replace the ditch. This pipe outfalls to the Brook at the western culvert headwall.

Surface water from the rural catchment areas to the south and west of the water course has been observed in large quantities discharging across the access and flowing into and across Lower Road causing traffic congestion and delays as well as posing danger to vehicles.

It is likely that the access installed as described has reduced the amount of interception, attenuation and diversion of over-ground flows from the north and west catchment which were previously controlled by the boundary ditches and hedge rows. It is also possible that by introducing a large impermeable surface adjacent to the brook, extremely fast runoff in peak storm conditions overloads the brook upstream of the culvert causing it to overflow into the carriageway. Further investigation is required.

5.0 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.

Area		1		2
Flooded Properties & Causes		One property flooded on west Witney Road Primary causes (i) Run-off from the fields exceeds the capacity of the only available drainage system, the highway drainage system. This system was not designed to deal with land run-off		Highway flooded at Riely Close Primary Causes (i) Highway run-off (ii) Landform and ground conditions
Options		**1**	**2**	**1**
Description of options		Replace drop kerbs with standard height kerbs and raise levels to the western perimeter of the property by bunding or using an impermeable barrier. Upsize the existing highway culverts.	Extend ditch in the field south of the highway. Provide attenuation to the north of the highway to control the runoff from the northern rural catchment	Provide a submersible pump and pipes situated in a chamber below ground at the bottom of the cul-de-sac which could force the highway runoff back out of the cul-de-sac. Options for dealing with the discharged water are discussed in the Conclusions and Recommendations Section 6.0
Responsible Agencies	**EA** For queries Tel: 08708 506506		EA participation and consents required	
	OCC For queries Tel: 08453 101111	Work would need to be initiated by OCC as highway would be affected		Work would need to be initiated by OCC as highway would be affected, and ongoing maintenance would be required
	Thames Water For queries Tel: 08459 200800			
	WODC For queries Tel: 01993 861000	WODC to facilitate work on this proposal	WODC to facilitate work on this proposal	WODC to facilitate work for this proposal, agreement needed on who would fund a feasibility study and design
	Private/Other Organisations	Private landowners agreement required to carry out work and maintain in perpetuity	Private landowners agreement required to carry out work and maintain in perpetuity	
Effectiveness/ Effects on adjacent land		Prevents flooding of west Witney Road properties in moderate events, calculations would need to be carried out to confirm effectiveness against extreme events	Provides 1 in 100 year flood protection. Requires land to the north of the property	Prevents flooding of road at Riely Close in a moderate event, , calculations would need to be carried out to confirm effectiveness against extreme events
Cost		£5k to £20k	£20k to £50k	£20k to £50k

Area		3		4	
Flooded Properties & Causes		Highway flooded on east Witney Road Primary causes (i) A combination of highway and rural run-off (ii) Design of highway drains (iii) Blocked highway gullies (iv) Landform around the Railway Bridge		Highway flooded at Lower Road Primary Causes (i) Design and location of landfill site access on Lower Road	
Options		**1**	**2**	**1**	**2**
Description of options		Undertake gully emptying and a drain survey to investigate the extent of the problem and the feasibility of providing attenuation or upgrades of the highway drainage	Upgrade the outfall from the highway drains to reduce the frequency of flooding and make the system less maintenance dependent.	Installation of a further culvert to the highway ditches to the south of the access and upgrading of adjacent ditches	Provide attenuation further upstream of the Caverswell Brook culvert
Responsible Agencies	**EA** For queries Tel: 08708 506506	EA participation and consents required			EA participation and consents required
	OCC For queries Tel: 08453 101111	Work would need to be initiated by OCC as highway would be affected	Work would need to be initiated by OCC as highway would be affected, and ongoing maintenance would be required	Work would need to be initiated by OCC as highway would be affected, and ongoing maintenance would be required	
	Thames Water For queries Tel: 08459 200800				
	WODC For queries Tel: 01993 861000	WODC to facilitate work for this proposal, agreement needed on who would fund a feasibility study and design	WODC to facilitate work on this proposal	WODC to facilitate work on this proposal	WODC to facilitate work for this proposal, agreement needed on who would fund a feasibility study and design
	Private/Other Organisations	Private landowners agreement required to carry out work and maintain in perpetuity		Private landowners agreement required to carry out work and maintain in perpetuity	Private landowners agreement required to carry out work and maintain in perpetuity
Effectiveness/ Effects on adjacent land		Feasibility study would determine effectiveness and effects on adjacent land	Prevents flooding of the road in moderate events		Provides 1 in 100 year flood protection. Requires private land to be used for this purpose
Cost		£10k to £20k	£10k to £20k	£5k to £20k	£20k to £50k

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Area 1 – Witney Road, A4095 Western Approach

6.1.1 Maintenance

The following on-going maintenance is recommended:

- Cleaning of highway gullies, culverts and drainage systems.

6.1.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Mid-Term (under 1-2 years)

- Action 1 – Replace drop kerbs with standard height kerbs and raise levels to the western perimeter of the property by bunding or using an impermeable barrier. Upsize the existing highway culverts in the road in front of the property. Bunding to field boundary north of highway.

Long-Term (3 years or more)

- Action 2 – Extend ditch in the field south of the highway, towards the highway. Provide attenuation in the fields to the north of the highway to control the runoff from the northern rural catchment.

6.2 Area 2 – Riely Close

6.2.1 Maintenance

The following on-going maintenance is recommended:

- Cleaning of highway gullies, culverts and drainage systems.

6.2.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Mid-Term (under 1-2 years)

Action 1 – Provide a submersible pump and pipes situated in a chamber below ground at the bottom of the cul-de-sac which could force the highway runoff back out of the cul-de-sac. There are 3 options for where the water will then be discharged;

Option 1- It could be pumped over the mound at the south end of the cul-de-sac. The water would then be taken in a carrier drain to the water course or a soak away.

Option 2 – The water could be pumped back up the Riely Close into the highway drain, if there is sufficient capacity in the highway drain to accept it. This option would require OCC to install a return pipe to connect with the highway drainage on Witney Rd.

Option 3- The water could be pumped back onto the school playing field. However, this option requires further investigation and may not be an acceptable solution.

All three options require further investigation and a commitment to ongoing maintenance of the pump. In addition to this the drainage of the school grounds is required to properly predict the over-ground flows from this area and determine how they affect flooding in the area.

6.3 Area 3 – Eastern Perimeter of the A4095, Witney Road

6.3.1 Maintenance

The following on-going maintenance is recommended:

- Clean out blocked gullies and highway drainage systems

6.3.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Mid-Term (under 1-2 years)

- Action 1 – Undertake gully emptying and a drain survey to investigate the extent of the problem and the feasibility of providing attenuation or upgrades of the highway drainage

- Action 2 – Upgrade the outfall from the highway drains to reduce the frequency of flooding and make the system less maintenance dependent.

6.4 Area 4 - Southern Perimeter, Lower Road

6.4.1 Maintenance

The following on-going maintenance is recommended:

- Cleaning of highway gullies, culverts and drainage systems.

6.4.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Mid-Term (under 1-2 years)

- Action 1 – Installation of a further culvert to the highway ditches to the south of the access and upgrading of adjacent ditches

Long-Term (3 years or more)

- Action 2 – Provide attenuation further upstream of the Caverswell Brook culvert to prevent flooding down stream, feasibility for this proposal would also need to be undertaken.

Appendix 1: Photographs

Area 1 – Blocked drain at Witney Road west

Area 1 – West approach to Hanborough showing ground levels

Area 1 – Culvert under Witney Road west

Area 1 – Water spray along Witney Road west

Area 1- Field west of Witney Road

Area 1 – Rural catchment to north of highway, western approach

Area 2 - Riely Close, Long Hanborough

Area 2 – Entrance to Hanborough Manor CE School

Area 3 – West of Witney Road, Railway bridge

Area 4 – Junction with Lower Road

Area 4 – Highway drain into culvert at junction

Area 4 – Entrance to Landfill Site