Section 19 Flood Investigation Report

Date: 7th June 2024

Section 19 Flood Investigation Report: Steventon, Vale of White Horse, Oxfordshire
Date of Flood Incident: 5th January 2024

Revision Schedule

Version	Date	Details	Author	Checked	Approved
1	10/05/2024	Draft Section 19 Flood Investigation Report	James Feest		
2	07/06/2024	Oxfordshire County Council Section 19 Final Flood Investigation Report		Chris Brown	Clare Mills
3	05/02/2026	Check for accessibility	AF	C Brown	C Mills

Executive Summary

This investigation has reviewed flooding that occurred within Steventon on the evening of the 4th through to the 5th January 2024.

Rainfall from Met Office named Storm Henk, saw damaging winds and heavy rain to southern and central parts of England and Wales. Exceptionally heavy rainfall, during the event was close to the monthly average. This coincided with significant rainfall in the previous month which had already saturated soils and likely increased stream baseflow.

Within Steventon over 20 residential properties and businesses internally flooded in multiple locations, from both main river Ginge Brook and a number of ordinary watercourses through the village.

Flooding from out of channel flows on the left bank of Ginge Brook upstream of Church Lane at the south western end of Steventon crossed fields and entered the upstream end of ordinary watercourses through the village.

There are multiple restrictions to channels through the village both on Ginge Brook and ordinary watercourses that contributed to the flooding.

Flooding out of the left bank of Ginge Brook between Steventon and the A34 led to flows down the bridleway back towards Milton Lane and into watercourses at the downstream end of the village. This was coupled with foul water flooding at this location from reported inundation of the Thames Water pumping station on Milton Lane.

There are several recommendations for general maintenance and improvement works to reduce risk in the future.

Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
Raise and discuss the issues and recommendations within this report at the periodic multi agency meetings. Invite the Parish Council and flood working group along to specific meetings to discuss issues in more detail	Lead Local Flood Authority (LLFA)	All Authorities
Environment Agency to advise Steventon Parish Council on assessment of feasibility and cost benefit for flood storage on Ginge Brook upstream of Steventon	Environment Agency (EA)	Parish Council
Review the frequency of maintenance of highway drainage assets, and look to increase the frequency of cleansing, in line with the current Countywide Highway Maintenance Programme and funding.	OCC Highways	
Further investigation of rivers Ginge Brook and Moor Ditch around A34 for obstructions to flow, silt levels, current flood spill locations and bank levels.	EA	Landowners
Desilt and reprofile roadside ditch and grips on The Causeway	Landonwers/OCC Highways	
OCC Highways to inspect highway culverts and ensure clear to accept flows.	OCC Highways	
Work with landowners to look at opportunities for schemes to manage flows upstream to ordinary watercourses to slow the flow such as nature based solutions (natural flood management) through partnership working.	LLFA, VWH	Landowners, Parish Council
Sections of watercourses and culverts are cleared of silt as highlighted in the analysis section by riparian landowners. The District Council and Environment Agency can assist with informing the riparian landowners of their duties as the land drainage authority.	Landowners	EA/VWH

Provide detail to residents on the operability of the Ginge Brook river gauge on Stocks Lane	EA	Parish Council
Assess existing arrangement and ongoing requirement for culvert trash screens on ordinary watercourses using latest Culvert, screens and outfall manual	LLFA, OCC Highways	
Evaluate the flood risk impact of public right of way timber footbridge off Castle Street and potential modification to deck level.	EA/OCC Countryside	
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs. Many properties have already carried out measures on their properties, but further funding and support may be available to help more people;	Homeowners	VWH, EA, OCC
Local community volunteer approaches to improve the community's ability to plan, respond and recover from flooding; link to local community emergency plans	All	Communities and Residents
VWH to use their powers under the Land Drainage Act 1991 to ensure Riparian owners carry out required maintenance.	VWH	Landowners
Pumping station and foul sewers to be checked for capacity issues, surface water connections, and blockages. Remedial works to be carried out as necessary to minimise surface water entering the system and increase capacity. Ensure the existing foul system is not compromised from future development proposals.	TW	LLFA
Flood assets to be added to the local flood register	LLFA	

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1. INTRODUCTION

1.1. Lead Local Flood Authority (LLFA) Investigation

Section 19 of the Flood and Water Management Act (F&WMA) states:

1) On becoming aware of a flood in its area, a Lead Local Flood Authority must, to the extent that it considers it necessary or appropriate, investigate: -
   a. which risk management authorities have relevant flood risk management functions, and
   b. whether each of those risk management authorities has exercised, or is
   c. proposing to exercise, those functions in response to the flood.

2) Where an authority carries out an investigation under subsection (1) it must: -
   a. publish the results of its investigation, and
   b. notify any relevant risk management authorities.

The LLFA have a set criteria which determines when a S19 report is required. The criteria is set out below.

LLFA/OCC Criteria

- Internal flooding (excluding to basements) to five or more residential properties or businesses within and area of 1km2.

- Internal flooding of a business premises employing more than 10 people within an area of 1km2.

- Internal flooding (excluding to basements) of at least one property or business for one week or longer.

- Flooding of one or more items of critical infrastructure, which could include hospitals, health centres, clinics, surgeries, colleges, schools, day nurseries, nursing homes, emergency services (police, fire, ambulance) stations, utilities and substations.

Caused a transport link to be impassable:

- Motorways, trunk roads, Class A and B highway closures shall all be investigated.

- Class C highways – 10 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.

- Class U highways – 24 hours or more unless the route is the only means of access, or is primary route for critical infrastructure then reduce to 4 hours.

- All rail link closures shall be investigated.

Any flooding event that a risk management authority deems significant but does not meet the agreed thresholds should be put forward to the Agency flood group meeting for consideration.

1.2. Site Location and context

The village of Steventon is located approximately 6.5km to the south of Abingdon town centre and 14km south of Oxford.

Parts of the village including many of the properties affected in the January 2024 flooding are located in Environment Agency defined flood zone 3. Land within flood zone 3 has a high probability of flooding from rivers and the sea (where applicable).

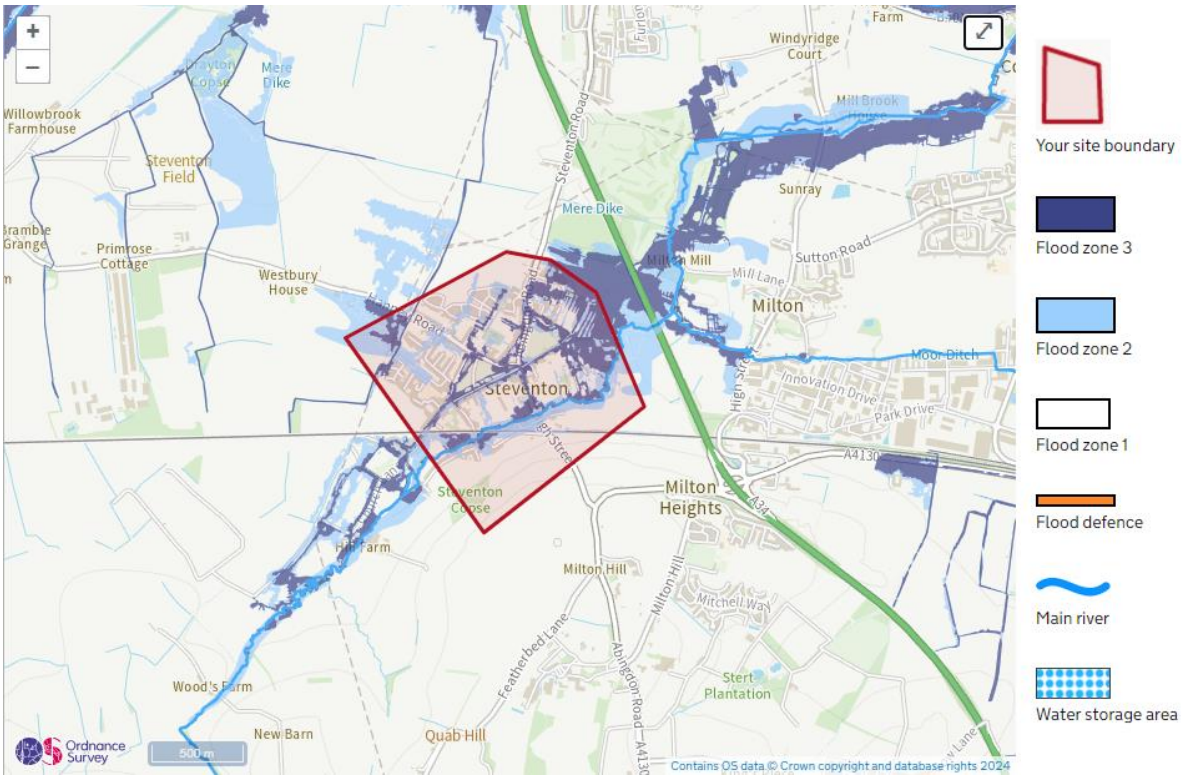

Figure 1 - Environment Agency Flood Map for Planning

Surface water flood maps available from the Environment Agency highlight that most of the village is considered at low risk. Low risk means that this area has a chance of flooding of between 0.1% and 1% each year. Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. There are also small areas shown at a medium risk of surface water flooding, areas with a chance of flooding of between 1% and 3.3% each year. These areas are shown as light and medium blue in Figure 2 below, with the high risk as dark blue being confined to around the channel boundary of Ginge Brook.

Figure 2 - Environment Agency risk of flooding from surface water map

The Ginge Brook, designated as main river, runs from west to east across the southern end of Steventon. There are multiple other smaller ordinary watercourses within Steventon, including unnamed watercourses that run parallel to the north of the main river alongside Vicarage Road/The Causeway and down to The Green, before joining The Ginge to the east of the village.

Both the unnamed watercourses and The Ginge are culverted in various locations under roads and accesses to properties.

1.3. Previous flood events

A review of flooding in Steventon has identified a number of previous events affecting the village. Historic data has been taken from an Environment Agency report produced after the 2007 flood.

November 1894	Catchment-wide flooding in the Thames catchment. Highest levels downstream of Oxford since records began. Numbers of properties affected unknown.

June 1903	Flooding on the upper Thames. Highest levels locks upstream of the Cherwell since records began. Numbers of properties affected unknown.
March 1947	Catchment-wide flooding in the Thames, including the Lee catchment. Over 10,000 properties affected.
July 1968	Flooding in the mid to lower Thames and severe flooding in the Mole and Wey catchments - Approximately 10,000 properties affected.
November 1974	Flooding in the lower Thames and its tributaries including Addlestone Bourne, Blackwater, Beam, Loddon, Emm Brook.
Easter 1998	Flooding in the Cherwell catchment – Approximately 1000 properties affected
October/November 2000	Catchment-wide flooding in the Thames - Approximately 1100 properties affected.
January 2003	Catchment-wide flooding in the Thames. Over 500 properties affected.
July 2007	73 properties flooded in Steventon
January 2014	Multiple properties flooded in Steventon and across Oxfordshire
February 2020	Multiple roads closed from flooding in Steventon during Storm Ciara and Storm Dennis

2. RECENT FLOOD ISSUES AND INVESTIGATION

2.1. Recent flood event

The Met Office's report into Storm Henk, the eighth storm of the 2023-2024 storm season, describes damaging winds and heavy rain to southern and central parts of England and Wales on 2 January 2024. Heavy rain from storm Henk contributed to significant flooding problems, following the wet weather during autumn and December 2023. Between 1 October 2023 and 4 January 2024, parts of the East Midlands, north-east England and eastern Scotland received more than 150% of the 1991-2020 long term average rainfall for the four-month period October to January.

In Oxfordshire, communities within the districts of Vale of White Horse and South Oxfordshire were the worst affected by this with multiple locations within these two districts experiencing more than 5 properties internally flooded.

In Steventon, it is reported by the Parish Council that over 20 properties and businesses were internally flooded with up to 30cm of water depth damaging floors, cupboards furnishings and more, with many other properties experiencing flooding of garden space or driveways.

2.2. Rainfall data analysis

Between 3pm on 4th January 2024 until around 1am the next morning, the Environment Agency rain gauge in Abingdon recorded 30.7mm of rainfall.

In general, for December 2023 over 150% of the average rainfall fell across the month in Oxfordshire. This led to ground conditions with lower infiltration capacity in advance of the Storm Henk event rainfall on 4th January.

Detailed hourly rainfall has been obtained from the rain gauge in Abingdon from mid day on the 4th Jan through to the morning of the 5th and is tabulated below.

Hour	Rainfall (mm)	Cumulative Rainfall (mm)
12:00 – 13:00	0.0	0.0
13:00 – 14:00	0.0	0.0
14:00 – 15:00	0.0	0.0
15:00 – 16:00	0.4	0.4
16:00 – 17:00	3.4	3.8
17:00 – 18:00	5.7	9.5
18:00 – 19:00	5.1	14.6
19:00 – 20:00	7.0	21.6
20:00 – 21:00	2.9	24.5
21:00 – 22:00	2.8	27.3
22:00 – 23:00	1.9	29.2

23:00 – 24:00	0.8	30.0
24:00 – 01:00	0.6	30.6
01:00 – 02:00	0.1	30.7
02:00 – 03:00	0.0	30.7
03:00 – 04:00	0.0	30.7
04:00 – 05:00	0.0	30.7

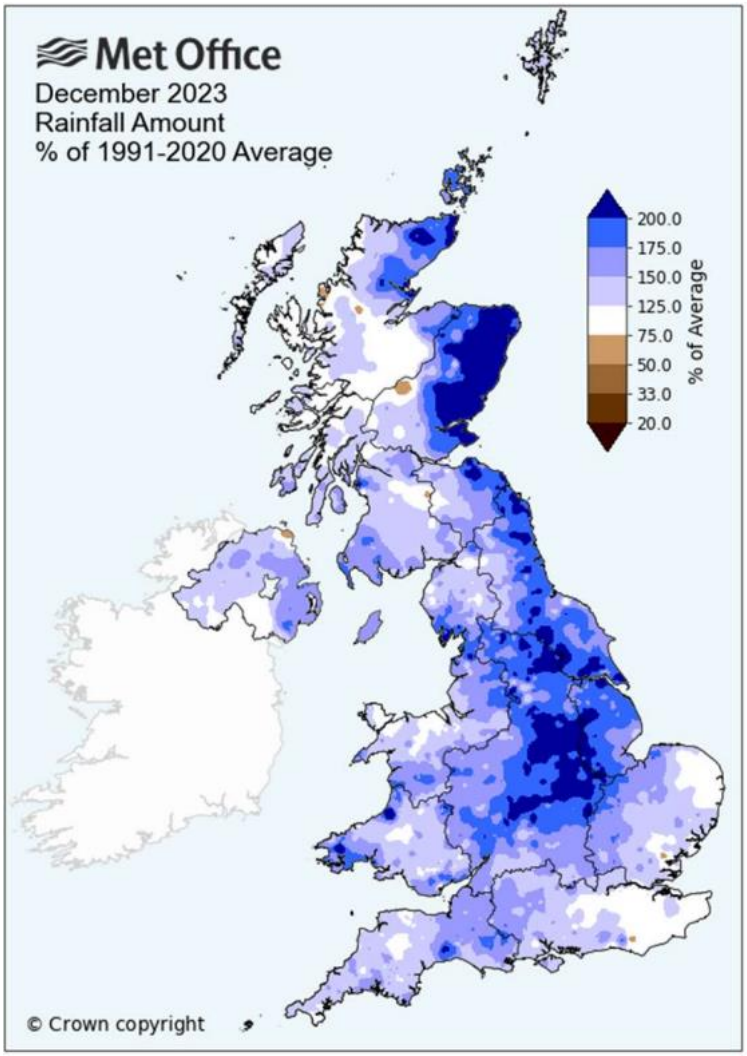

Figure 3 - Met Office December 2023 rainfall % of monthly average

2.3. Site visits and observations

Multiple site visits were carried out by Oxfordshire County Council, Vale of White Horse District Council, and the Environment Agency after the flood event. The EA's Community Information Officers also yvisited during the flooding to speak to residents and record data/photographs.

Initially two meetings with flooded residents on High Street and Vicarage Road took place in January. On 22nd February a full river walkover from upstream of Steventon looking at Ginge Brook, ordinary watercourses through the village to downstream of Steventon at the A34 and the offtake to Moor Ditch was carried out with OCC, VWH Council, the EA and members of Steventon flood group.

On this site visit anecdotal evidence suggested that at the upstream end of Steventon, Ginge Brook in the flood event broke the left bank, with these flows crossing the adjacent field and entering an ordinary watercourse that runs down to Vicarage Lane and The Causeway. This was supported by reports of a sharp rise in the levels in this watercourse downstream that was otherwise within capacity until that time.

Figure 4 - Out of channel flows from Ginge Brook into ordinary watercourse upstream of Steventon

Focussing on the main river, Ginge Brook, there are multiple culverts and bridges from this upstream point through the village including highway culverts, the crossing under the rail line as well as a public right of way footbridge. It was reported that flooding occurred at each of these.

From upstream, at the first of these Ginge Brook was seen to be at the soffit level of a timber footbridge behind properties on Castle Street during the site visit. Residents

reported that the deck of the new bridge replaced in 2023, was lower than the previous. The Environment Agency and OCC Countryside team have since been in contact to discuss whether this is the case and any flood risk effect this bridge may have.

Figure 5 - Timber bridge on footpath off Castle Street

The next, a highway culvert on Stocks Lane that also was reported to have capacity issues in the January event is the site of the Environment Agency's river level gauge. Residents stated on the site visit that they believed the maximum recorded level on the gauge is lower than the peak river level in flood events. It was agreed on site that

the Environment Agency would report back to the Parish with information on the gauge and its recording in response to their query.

After this the river undergoes a couple of near 90 degree turns either side of the culvert under the rail line on Stocks Lane. This culvert was also reported to be at or over capacity and water backing up flooded properties upstream of this point.

The final culvert within Steventon where flooding occurred was the highway culvert under High Street adjacent to Station Yard. Flooding from this culvert affected around 8 residential properties and 2 businesses, flows down the High Street from this location added to ordinary watercourse flooding around the Causeway/Milton Lane junction.

The below image taken in gardens behind flood affected properties on the west side of High Street shows the tide mark from the January event at around 40cm depth.

Figure 6 - Tide mark in rear garden of property on High Street

Once downstream of the village to the east, Ginge Brook takes a turn to the north through fields and farmland where it then runs alongside the bridleway between Steventon and Milton.

Flood levels on the bridleway were as deep as 30cm in places at the time of the February site visit, outside of flood conditions elsewhere and over a month after the 4th January event, shown below.

Figure 7 - Bridleway (left) in flood during February site visit

The offtake to Moor Ditch, another main river fed by Ginge Brook was observed to be dry at upstream end at the time of the site visit however flows were entering this channel at a point approximately 150m south of the offtake through overland flows out of Ginge Brook and through a culvert under the A34 that joins Moor Ditch, as well as reported to be flowing up to 30cm deep through the underpass further south of this during the flood event.

When looking at the multiple ordinary watercourses through Steventon, water levels from baseflow were relatively high on the February site visit. It was observed that multiple property accesses have relatively small culverts on these watercourses, however maintenance of culverts and channels by resident riparian owners was seen in most locations to be good as the maintenance of these is carried out by residents

alongside general garden work. There was little obstruction to flows other than services to properties crossing the channels at various locations.

There are two trash screens on the watercourses, one at the junction of Vicarage Road and The Causeway under a short section of highway culvert, and one on the same watercourse outside the entrance to St Michaels C Of E Primary School.

On 8th May, a site visit with the flood group and OCC highways was undertaken to discuss highway drainage assets including culverts. It was agreed that additional surveying of the culverted sections of watercourses to better understand the connectivity in some locations and cleansing where necessary would be carried out. It was observed on that site visit that the open channel behind properties on Barnett Road was relatively overgrown with vegetation and agreed that discussion with the riparian owners was necessary to carry out works to clear this and reduce restrictions to flow.

2.4. Assessment

There are many culverts on both the main river through Steventon and the multiple ordinary watercourses. Because flooding occurred at the majority of the culverts through Steventon, it would not be practical to recommend modification to these with a view to increase capacity as whilst these do vary in size, increased flows through each would lead to a greater flood risk at the next. Also aside from the significant expense of such work, a greater conveyance through the whole of Steventon in modification to them all would lead to increased flows on Ginge Brook through to Sutton Courtenay, Milton and Didcot via Moor Ditch, and also locations on the Thames.

Whist there is no recommendation into modification of structures on systems on Ginge Brook through Steventon, there are multiple locations where there is a significant cross sectional loss in channel through siltation. Widespread desilting of the river is not recommended in this report however sections with slower flow and larger deposits around the rail culvert by Stocks Lane and the section at the A34 would benefit from reduction in silt levels.

In relation to Ginge Brook, properties flooded from lack of capacity of either culverts or open channel in five distinct locations through Steventon. These are marked in red on the two plans below, notably backing up at multiple culvert inlets.

On the ordinary watercourses through Steventon flooding occurred at numerous culverts and crossings, in part due to the small cross sectional area of these and service crossings as mentioned in the previous section of the report.

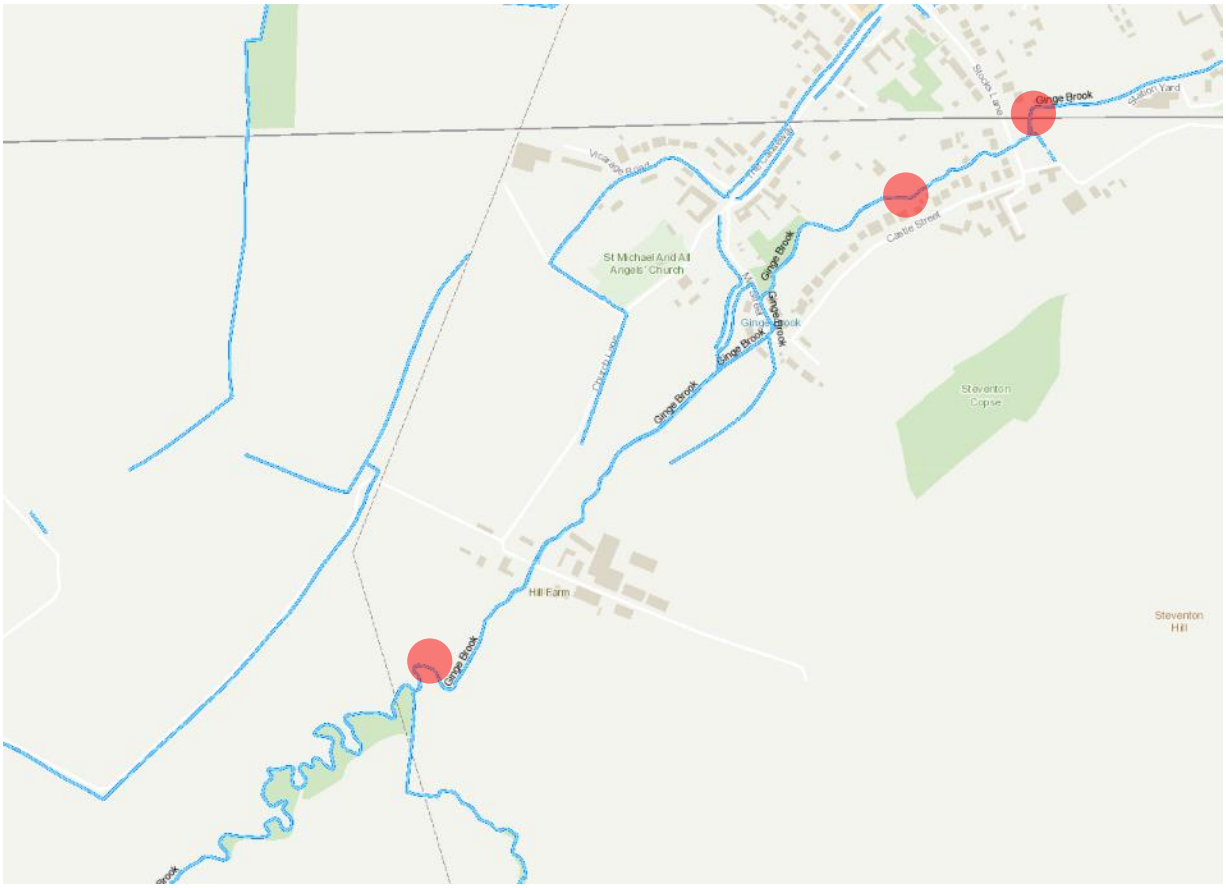

Figure 8 - Main river flood locations 1

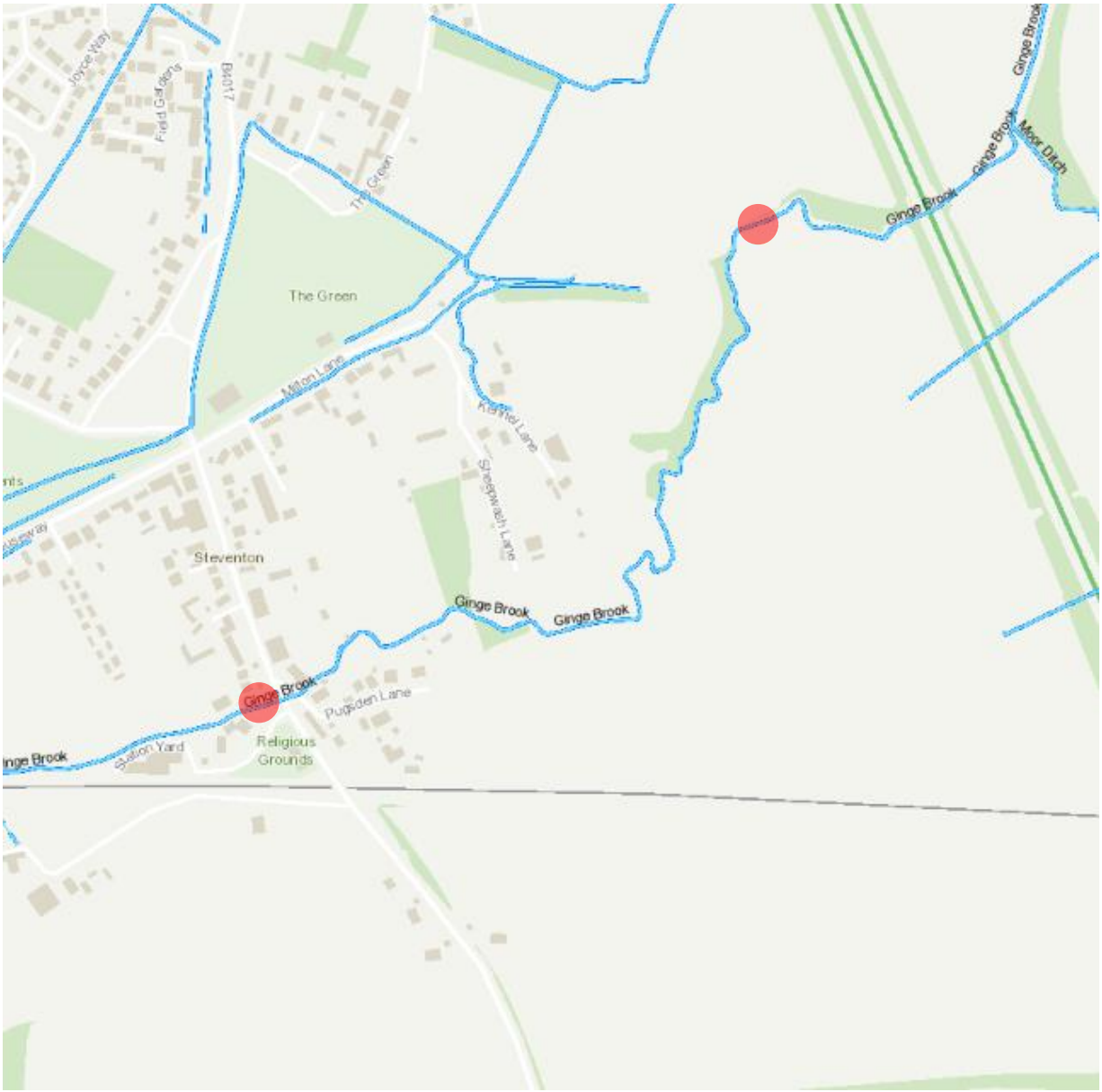

Figure 9 - Main river flood locations 2

The furthest upstream of these on Ginge Brook, south of Mill Farm, flooded on the left bank into farmland. These flood flows crossed this land and entered the ordinary watercourse running in parallel to the main river to the west. The combination of already high levels in the ordinary watercourse and the additional cross catchment flows affected one property internally on Vicarage Road and contributed to high levels and flooding through the centre of Steventon

It is recommended that the Environment Agency advise the Parish Council on assessments made into the feasibility and cost benefit assessment for flood storage and other options for reducing fluvial flood risk for Ginge Brook through Steventon and downstream communities.

The next location of flooded properties adjacent to Ginge Brook in January was around a bridge and two culverts on Castle Street and Stocks Lane. Flooding at

these locations was reported by residents to be over 60cm. It has been raised by those affected that culverts notably those owned by Network Rail at this location are heavily silted. An assessment into this siltation and its impact on the conveyance of the main river through this location should be carried out by the Environment Agency to advise and enforce where required works by riparian owners where there is a potential for flood risk.

As residents reported potential issues with the river level gauge on Stocks Lane, it is also recommended that the Environment Agency assess the operability of it and advise residents of their findings.

Further downstream where Ginge Brook crosses under the High Street, B4017 (culvert shown below) next to the junction to Station Yard, backing up at this culvert led to out of channel flows, through the rear of properties on the west of the road. There were 8 residential properties and 2 businesses flooded internally around this location. Flows through and around properties and onto High Street continue down towards the village green around Milton Lane/The Causeway junction. These flows meet that from flooding from the ordinary watercourses at this location.

Figure 10 - Ginge Brook highway culvert on High Street

Two ordinary watercourses run mostly parallel through Steventon along each side of The Causeway from the upstream end at Vicarage Road, until at High Street the

down to Milton Lane and Abingdon Road on The Causeway. There are multiple culverted property access crossings, some of which have a relatively small cross section or are partially obstructed by services crossing the channel.

There were conflicting reports on the significance of the overland flow from upstream agricultural land impacted in the January flood on ordinary watercourses. Engagement with landowners on possible changes to farming practices that reduce flood risk such as direction of cropping, and providing advice on grants available for wild grass buffer strip planting on field margins to slow surface water flows may be beneficial.

Like the structures on the main river there are limited options on these watercourses in modifying structures to reduce flood risk although there are multiple smaller improvements that could be made. Desilting of culverts for example at the junction of Vicarage Road and The Causeway as well as an assessment for the potential removal of the makeshift vertical bar trash screen is recommended. This current screen may create more of a blockage risk at the inlet to the relatively short straight section of highway culvert than prevent within the culvert. An inspection and desilting where required of the two Network Rail culverts under the rail line on the Causeway would also reduce the backing up of water at this location.

The ordinary watercourses through Steventon flow downstream of Milton Lane where they pass through farmland and join Ginge Brook at the southern boundary of Drayton Park golf course. The rate at which these watercourses can discharge to Ginge Brook at this location was limited due to the high levels of the main river.

As mentioned in the previous section, riparian maintenance of ordinary watercourses outside of properties through Steventon is generally good. However - to ensure this maintenance is continued the Steventon Flood Group should work with OCC and the District Council to remind residents of their riparian responsibilities and including maintenance of those sections owned by the Parish Council.

Foul water flooding was reported at the Thames Water pumping station at the bottom end of Milton Lane by residents. It is recommended that further investigation is taken by Thames Water into the operability of the system at this location. This includes the pumping station and foul sewers, checking for capacity issues, surface water connections, and blockages. In addition remedial works are to be carried out as necessary to minimise surface water entering the system and increase capacity both for its operation at present and with any proposed future development.

Downstream of Steventon on Ginge Brook, lower channel capacity within a 350m section around its crossing under the A34 led to flooding out of the left bank to the bridleway between Steventon and Milton. This flooding was present during multiple months of winter and was observed on site visit on 22nd Feb 2024. Flood flows onto the bridleway were seen to be running back towards Milton Lane and into other watercourses contributing to the flooding experienced by residents at the bottom end of the village. An indicative plan of these flow routes is shown below. Flooding at this

location over the right bank also contributed to flooding to properties in other locations outside of Steventon during the January event.

Figure 11 - Left bank out of channel flow from Ginge Brook

Residents have made attempts to patch low spots in the bank of Ginge Brook at multiple locations to prevent flood waters running out of channel and back towards Steventon however the narrow width of the raised earth bank between watercourse and bridleway leaves limited structure against continued erosion.

Greater fall on Ginge Brook downstream of the Moor Ditch offtake around 100m downstream of the A34 showed that the river was within capacity. The approximately 350m section either side of the A34 has very little gradient and as a result deposited silt over time which has reduced the cross sectional area of the channel as shown by flooding occurring at this point continually over the winter months in 2023/24.

This section is not the original course of Ginge Brook. Mapping from OS one inch 1885-1903 in figure 13 shows the historical route of Ginge Brook, which runs almost parallel to the alignment of Steventon Road south to north, the modern river runs in what was previously the cut for Milton Mill. As this alignment is a man-made channel at a potentially shallower gradient, the river may not self-cleanse of silt in the same way as the historical river would have, and this section is heavily silted relative to other locations on the same river through Steventon and down to Drayton Mill.

The abandonment of the original river course would also reduce the conveyance by having one channel now that was not built for the full flow of Ginge Brook instead of the previous two. Figure 14 shows the current main river alignment overlaid on the previously mentioned OS 1885-1903 mapping.

Figure 12 - OS 1 inch map 1885-1903 showing historical alignment of Ginge (Mill) Brook

Figure 13 - OS 1 inch overlaid with modern river alignment (blue)

Figure 14 - Siltation approx. 40% of channel capacity downstream end of culvert under A34

It is recommended that the Environment Agency assess this 350m section of river for the benefit of desilting work by landowners to increase conveyance from the approximate location of the historical offtake to Milton Mill and abandoned original river channel upstream of the A34 to the offtake to Moor Ditch downstream of the A34.

The offtake of this main river, not flowing during the flood event and in February was inspected on 16th April and clearance of silt built up over the inlet was cleared to allow flows into the upstream end of Moor Ditch.

Figure 15 - Moor Ditch offtake inlet after offtake silt clearance

Figure 17 – Silt build up adjacent to

Figure 16 - Moor Ditch flowing after offtake inlet clearance

Additionally further investigation is recommended into interface between rivers Ginge Brook and Moor Ditch between Steventon and Milton in relation to the current overspill locations in flood both on the left and right bank and alternative routes for these flows.

3. CONCLUSIONS

This investigation has reviewed flooding that occurred within Steventon on 5th January 2024. Rainfall from named storm, Storm Henk, saw damaging winds and heavy rain to southern and central parts of England and Wales. Exceptionally heavy rainfall, during the event was close to the monthly average. This coincided with significant rainfall in the previous month which had already saturated soils and likely increased stream baseflow.

Within Steventon residential properties and businesses internally flooded in multiple locations, from both Ginge Brook and a number of ordinary watercourses through the village.

Flooding from out of channel flows on the left bank of Ginge Brook upstream of Church Lane at the southwestern end of Steventon crossed fields and entered the upstream end of an already at capacity ordinary watercourse through the village.

As there are multiple restrictions and flooding from culverts throughout the village on Ginge Brook, an increase in capacity at any of these culverts would likely increase peak flow and flood risk at the next downstream. Because of this no recommendation except with further modelling could be recommended to alter any of these structures.

Continued maintenance by riparian owners and some modifications to structures through the village on ordinary watercourses would have some flood risk benefit. Private resident maintenance of culverts and channels is seen as generally good through Steventon however there are some locations on these ordinary watercourses where inspection of culverts and clearance where necessary are recommended.

Foul water flooding reported by residents on Milton Lane requires further investigation by Thames Water into the operability of the system at this location on sewers and the pumping station for its operation at present and with any additional future development

Flooding out of the left bank of Ginge Brook between Steventon and the A34 led to flows down the bridleway towards Milton Lane and into watercourses at the downstream end of the village, causing them to back up, contributing to flooding. Clearance of silt in the channel of Ginge Brook around the A34 and further investigation into the out of channel flows that affect both Steventon and other communities from adjacent to Moor Ditch is recommended.

4. RIGHTS AND RESPONSIBILITIES

4.1. Communities and Residents

Communities may consist of the Town or Parish Council, Flood Forum, Community Group and affected residents, amongst others.

Communities and residents who are aware that they are at risk of flooding should take action to ensure that they and their properties are protected.

Community resilience is important in providing information and support to each other if flooding is anticipated. Actions taken can include subscribing to MET Office email alerts for weather warnings, nominating a Community Flood Warden, producing a community flood plan, implementing property level protection and moving valuable items to higher ground. Finally, individual households can create their own personal flood plans, such as collating important documents for quick removal from the property, torches, waterproof clothing etc.

Oxfordshire County Council has produced a number of flood guides covering various subjects, some of which relate to this type of flood incident. The relevant guides have been identified and are available at: www.oxfordshirefloodtoolkit.com

4.2. Lead Local Flood Authority (LLFA)

As stated within the introduction section, OCC as the LLFA has a responsibility to investigate flood incidents under Section 19 of the F&WMA.

The LLFA also has a responsibility to maintain a register of assets which have a significant effect on flooding from surface runoff, groundwater or ordinary watercourses (non-Main River) as detailed within Section 21 of the F&WMA. The register must contain a record about each structure or feature, including the ownership and state of repair. OCC is also required to keep a record of flooding hotspots across the county.

OCC's practices relating to third party assets is to notify third party owners of their asset forming part of a flood risk system, and assist by advising those third party owners on the condition of their assets and their maintenance responsibilities.

As Lead Local Flood Authority, OCC will be looking for support from other risk management authorities, communities and individual home owners to ensure flood incidents are reported, and any assets which have a significant effect on flood risk are recorded on the asset register.

While OCC can suggest possible causes of flooding, and make recommendations to ensure flood risk is mitigated as far as possible, the F&WMA does not provide OCC with the mandate or funding to act on identified causes of flooding or force risk management authorities to undertake any recommended actions.

4.3. Highway Authority (Oxfordshire Highways)

Oxfordshire Highways have a duty to maintain the highway under Section 41 of the Highway Act 1980 but subject to the special defence in Section 58.

New highway drainage systems are designed to Highways England's Design Manual for Roads and Bridges (Volume 4, Section 2). They are only required to be constructed to drain surface water runoff from within the highway catchment rather than from the wider catchment.

There are historic drainage systems in historic highways which can become the responsibility of the Highway Authority due to dedication, as opposed to adoption. These drainage systems may not have been designed to any standard.

Oxfordshire Highways undertake regular highway drainage cleansing. Identify and develop a detailed plan of their assets.

If flooding occurs OCC will assess the capacity of the highway assets and identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works should be considered.

Oxfordshire highways should assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities.

4.4. Water Authority - Thames Water Utilities (TW)

Water and sewerage companies are responsible for managing the risks of flooding from surface water, foul water or combined sewer systems. Public sewers are designed to protect properties from the risk of flooding in normal wet weather conditions. However, in extreme weather conditions there is a risk that sewer systems can become overwhelmed and result in sewer flooding.

Sewerage undertakers have a duty, under Section 94 of the Water Industry Act 1991, to provide sewers for the drainage of buildings and associated paved areas within property boundaries. Since the 1st October 2011 the majority of private sewers and lateral drains in England and Wales were transferred into public ownership, meaning they are now the responsibility of the relevant sewerage undertaker.

A public sewer is a conduit, normally a pipe that is vested in a Water and Sewerage Company or predecessor, that drains two or more properties and conveys foul, surface water or combined sewage from one point to another, and discharges via a positive outfall.

There is no automatic right of connection for other sources of drainage to the public sewer network. Connection is therefore discretionary following an application to connect.

4.5. Vale of White Horse District Council (VWH)

District Councils have powers under Section 14 of the Land Drainage Act 1991 (LDA) to undertake flood risk management works on ordinary watercourses (non Main River) where deemed necessary.

Under Section 20 of the LDA, District Councils have the powers to (by agreement of any person and at that person's expense) carry out any drainage work which that person is entitled to carry out. Agreement may not be required in certain emergency or legally upheld situations.

Vale of White Horse District Council also has delegated authority from OCC/LLFA to serve notice on persons requiring them to carry out necessary works to maintain the flow of ordinary watercourses under Section 25 of the LDA and receives funding from the LLFA to do this.

The District Council is the Planning Authority and has a role in Building Control and the Building Regulations.

4.6. Environment Agency (EA)

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through national and strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery.

The EA also has operational responsibility for managing the risk of flooding from main rivers. Main rivers are usually larger river and streams and include all watercourses defined on the main river map which can be accessed at https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/StatutoryMainRiverMap&Mode=spatial

The responsibility for maintenance and repair of rivers lies with the riparian owner, but the EA have permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991 (WRA).

The EA encourage third party asset owners to maintain their property in appropriate condition and may take enforcement action on a prioritised basis where it is appropriate. They may also consider undertaking maintenance or repair of third party assets only where it can be justified in order to safeguard the public interest and where other options are not appropriate.

Further remit of the EA includes;

- preparing preliminary flood risk assessments and flood risk management plans for flooding from main rivers, reservoirs and the sea (Flood Risk Regulations 2009)

- warning and informing (Ministerial Direction to the National Rivers Authority, 1996)

- regulating activities that may affect the risk of flooding from main rivers (Environmental Permitting Regulations (England and Wales) Regulations 2016)

- Carrying out surveys and mapping (Flood Risk Regulations 2009, Water Resources Act 1991)

- reporting to the minister on flood and coastal erosion risk and how the national and local strategies are being applied by all of the authorities involved (FWMA, 2010)

- acting as a statutory consultee for planning authorities providing advice on planning applications, local plans and environmental assessments regarding flood risk from main rivers and the sea (Town and Country Planning (Development Management Procedure) (England) Order 2015)

4.7. Land Owners and Developers

Land owners are responsible for the drainage of their land and controlling any movement of sediment from their land. Legally, owners of lower-level ground have to accept natural land drainage from adjacent land at a higher level. The exception to this is where the owner of the higher level land has carried out “improvements” such that the runoff from the land cannot be considered “natural”.

Agricultural practices by land owners can be considered as “improvements” to the land, so that cultivation of crops or other land uses can take place. Mitigation works are required on improved land to account for the change in natural land drainage and changes to surface water runoff this can create.

Land owners and developers are responsible for working with the Local Planning Authority to ensure that their development is completed in accordance with the planning permission and all conditions that have been imposed.

Advice for developers is available on the Oxfordshire Flood Toolkit.
www.oxfordshirefloodtoolkit.com/planning/developers/

5. RECOMMENDATIONS

5.1. General

Listed below are the recommendations emanating from this formal Section 19 Flood Investigation Report. All the actions are simply initial recommendations that require discussing in detail to determine their true feasibility.

It is important to note that it is for the relevant responsible body or persons to assess each recommendation in terms of the legal obligation, funding, resource implications, priority and cost/benefit analysis of undertaking such action.

The recommendations may be included within the action plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programmes, as appropriate.

Authorities should work together Look into funding opportunities to carry out the listed actions. There are multiple funding sources which could contribute to schemes and improvement works going forward. The majority schemes will require elements of partnership working and contributions to be successfully funded. They are likely to need to provide multiple benefits such as improving flood resilience whilst also managing water levels, reducing drought risks, helping nature recovery as well as climate adaptation.

There are several funding options available which can be explored through multi agency working groups such as,

- Flood & Coastal Erosion Risk Management (FCERM) ○ Flood Defence Grant in Aid (FDGiA)
    - ○ Local Levy Regional Flood and Coastal Committee (RFCC)
- DEFRA Natural Flood Management Funding
- Woodland Creation Grants
- Agricultural & Environmental Schemes (Countryside Stewardship)
- Funding sources relating to development and regeneration, such as section 106 agreements, Community Infrastructure Levy (CIL) and New homes bonus
- Non-government organisations and charitable trusts
- Community fundraising and events
- Lotteries (Heritage Lottery Fund, Big Lottery, Arts Council
- Volunteering
- Nature for Climate Fund
- Grants from other government departments, such as BEIS, MHCLG, DfT, DfE (for example, Flood Resilient Schools)
- UKRI – the research councils funding
- Business in the community
- Green recovery challenge fund
- Partnership funding (for example, contributions from partners, local authorities, businesses, and communities etc.

5.2. Main Recommendations

Recommendation	Lead Stakeholders	Consulting stakeholders
Raise and discuss the issues and recommendations within this report at the periodic multi agency meetings. Invite the Parish Council and flood working group along to specific meetings to discuss issues in more detail	Lead Local Flood Authority (LLFA)	All Authorities
Environment Agency to advise Steventon Parish Council on assessment of feasibility and cost benefit for flood storage on Ginge Brook upstream of Steventon	Environment Agency (EA)	Parish Council
Review the frequency of maintenance of highway drainage assets, and look to increase the frequency of cleansing, in line with the current Countywide Highway Maintenance Programme and funding.	OCC Highways	
Further investigation of rivers Ginge Brook and Moor Ditch around A34 for obstructions to flow, silt levels, current flood spill locations and bank levels.	EA	Landowners
Desilt and reprofile roadside ditch and grips on The Causeway	Landonwers/OCC Highways	
OCC Highways to inspect highway culverts and ensure clear to accept flows.	OCC Highways	
Work with landowners to look at opportunities for schemes to manage flows upstream to ordinary watercourses to slow the flow such as nature based solutions (natural flood management) through partnership working.	LLFA, VWH	Landowners, Parish Council
Sections of watercourses and culverts are cleared of silt as highlighted in the analysis section by riparian landowners. The District Council and Environment Agency can assist with informing the riparian landowners of	Landowners	EA/VWH

their duties as the land drainage authority.		
Provide detail to residents on the operability of the Ginge Brook river gauge on Stocks Lane	EA	Parish Council
Assess existing arrangement and ongoing requirement for culvert trash screens on ordinary watercourses using latest Culvert, screens and outfall manual	LLFA, OCC Highways	
Evaluate the flood risk impact of public right of way timber footbridge off Castle Street and potential modification to deck level.	EA/OCC Countryside	
Property flood resilience (PFR) measures which improve the resilience of the community before a flood occurs. Many properties have already carried out measures on their properties, but further funding and support may be available to help more people;	Homeowners	VWH, EA, OCC
Local community volunteer approaches to improve the community's ability to plan, respond and recover from flooding; link to local community emergency plans	All	Communities and Residents
VWH to use their powers under the Land Drainage Act 1991 to ensure Riparian owners carry out required maintenance.	VWH	Landowners
Pumping station and foul sewers to be checked for capacity issues, surface water connections, and blockages. Remedial works to be carried out as necessary to minimise surface water entering the system and increase capacity. Ensure the existing foul system is not compromised from future development proposals.	TW	LLFA

Flood assets to be added to the local flood register	LLFA	

5.3. Communities and Residents

(e.g. Town/Parish Council, Flood Forum, Community Group, landowners and affected residents)

Nominate a Community Flood Warden to help coordinate the following:

- Preparing Household Emergency Plans for vulnerable properties in this area.
- Regularly inspecting ditches and pipework in the area of flood risk. Report blockages or other issues to the landowner and the LLFA.
- Explore options for property level protection and implement any recommendations. This could include additional drainage at the rear of properties, self-sealing air bricks and flood barriers.

Information on Flood Prevention measures for Home Owners, Communities and Businesses can be found on the Flood Toolkit:
www.oxfordshirefloodtoolkit.com/risk/prevention

Residents should check whether they are at risk of flooding by using the long term flood risk service www.gov.uk/check-long-term-flood-risk.If they are at risk of flooding they should sign up for flood warnings by visiting sign up for flood warnings-gov.uk.

Permanent measures such as installing floodgates, raising VWH, OCC and the EA can provide advice on these matters and more information can be found at:
www.oxfordshirefloodtoolkit.com/emergency/preparation
https://nationalfloodforum.org.uk/

Explore community wide solutions (e.g. attenuation areas, overflow routes, tree planting). Use the Flood Toolkit Funding Tool to find sponsors who may be willing to help fund improvement projects: www.oxfordshirefloodtoolkit.com/risk/funding

Continue to report flood incidents to the Lead Local Flood Authority at: www.oxfordshirefloodtoolkit.com/emergency/report-flood. Endeavour to obtain as much evidence of flood events as possible, such as photographic and video evidence.

Residents to explore obtaining Government subsidised flood insurance via Can Flood Re help me? https://www.floodre.co.uk/

5.4. Lead Local Flood Authority (LLFA)

LLFA team to work with the Oxfordshire County Council Resilience Team and the EA to set up and support a community based Flood Warden Network.

Assist the Oxfordshire County Council Resilience Team, the EA and other flood management authorities to support the community in the production of a Community Flood Plan and provide advice to residents on how to explore options for property level protection.

Inform owners of the drainage systems and watercourses within the overall surface water catchment area of their legal responsibilities.

Re-establish the Agency flood group meetings to discuss problems and to look at strategies to combat flooding due to Climate Change. Have periodic meetings with the local flood group to discuss the issues and recommendations with representatives from key authorities.

Work with VWH in looking at opportunities for schemes to manage flows upstream such as nature based solutions through partnership working.

5.5. Environment Agency (EA)

The EA is responsible for taking a strategic overview of the management of all sources of flooding and coastal erosion. This includes setting the direction for managing the risks through national and strategic plans; providing evidence and advice to inform Government policy and support others; working collaboratively to support the development of risk management skills and capacity; and providing a framework to support local delivery.

The EA also has operational responsibility for managing the risk of flooding from main rivers. Main rivers are usually larger river and streams and include all watercourses defined on the main river map which can be accessed at https://environment.data.gov.uk/DefraDataDownload/?mapService=EA/StatutoryMain RiverMap&Mode=spatial

The responsibility for maintenance and repair of rivers lies with the riparian owner, but the EA have permissive powers to carry out maintenance work on main rivers under Section 165 of the Water Resources Act 1991 (WRA).

The EA encourage third party asset owners to maintain their property in appropriate condition and may take enforcement action on a prioritised basis where it is appropriate. They may also consider undertaking maintenance or repair of third party assets only where it can be justified in order to safeguard the public interest and where other options are not appropriate.

Further remit of the EA includes;

- preparing preliminary flood risk assessments and flood risk management

plans for flooding from main rivers, reservoirs and the sea (Flood Risk Regulations 2009)

- warning and informing (Ministerial Direction to the National Rivers Authority, 1996)

- regulating activities that may affect the risk of flooding from main rivers (Environmental Permitting Regulations (England and Wales) Regulations 2016)

- Carrying out surveys and mapping (Flood Risk Regulations 2009, Water Resources Act 1991)

- reporting to the minister on flood and coastal erosion risk and how the national and local strategies are being applied by all of the authorities involved (FWMA, 2010)

- acting as a statutory consultee for planning authorities providing advice on planning applications, local plans and environmental assessments regarding flood risk from main rivers and the sea (Town and Country Planning (Development Management Procedure) (England) Order 2015)

5.6. Highway Authority (Oxfordshire Highways)

Regularly check and maintain highway assets through Steventon in line with their current maintenance regimes. Add detailed information of the assets to the OCC Asset Register.

Assess the capacity of the highway assets with support from the LLFA and VWH to identify any areas with insufficient capacity for draining runoff from the highway. Where this leads to flood risk to properties improvement works must be considered.

Assess the suitability of third party drainage systems accepting discharge from Highway Drainage systems and report any unsatisfactory areas to the relevant Risk Management Authorities. Work with the community and LLFA to clarify ownership and maintenance responsibilities for watercourses, particularly where these are located within or near to the highway.

5.7. Water Authority Thames Water Utilities (TW)

Assess the sources of water entering the public sewerage system. Foul sewers to be checked for surface water connections, blockages and capacity issues. Remedial works to be carried out as necessary to minimise surface water entering the system and increase capacity.

Assess the capacity of their assets and identify any areas of insufficient capacity. Where this leads to flood risk to properties improvement work must be considered.

Ensure the existing foul system is not compromised from future development proposals.

5.8. Vale of White Horse District Council

Continue to consult with the Environment Agency and Lead Local Flood Authority as required in respect of planning applications for new developments to reduce flood risk. Aim to ensure that all works are carried out in accordance with the approved plans and documents.

Review the planning policies relating to developments in the vicinity of the flooding incident, together with any flood risk assessments and drainage designs. Consider contacting the developers to take action in the event that any items relating to surface water drainage and flood risk are not evident or ineffective in the final developments or in the construction period.

Utilise their enforcement powers under Section 25 of the Land Drainage Act 1991 where it is considered that riparian owners are failing to maintain ordinary watercourses in their ownership.

Continue regular maintenance of their Ordinary watercourse Assets, in line with current maintenance regimes.

Endeavour to assist other flood risk management authorities and land owners in the preparation of a detailed plan of assets relating to drainage and flood risk, to share with the LLFA and the community.

Support landowners to investigate private drainage and check for blockages and defects with remedial works to be carried out where necessary.

Continue to support homeowners and businesses in providing individual property level protection.

5.9. Land Owners and Developers

Developers should work with local authorities to ensure all development is completed in accordance with approved plans and documents, and planning policy.

Land owners should undertake regular inspection and maintenance of their drainage systems in accordance with a defined maintenance regime. Further, they should identify and develop a detailed plan of their assets to share with the LLFA, other flood risk management authorities and the community.

Land owners should assess the capacity of their drainage systems and identify any areas with insufficient capacity for the collection, conveyance, storage and disposal of surface water. Where this could lead to runoff to the public highway or nuisance to third party private property, improvement works should be considered.

Landowners who are riparian owners are responsible for carrying out work to maintain the natural flow of water in the relevant watercourse. Such work will include the removal of significant blockages and the removal of vegetation if it is causing premature flooding to third party land and or property.

Review the library of flood guides on the Oxfordshire Flood Toolkit.

Agricultural land owners should carry out works to their land to reduce surface water runoff. These include following principles of good soil husbandry and providing land drainage systems such as ditches (https://www.gov.uk/guidance/create-and-use-a-soil-management-plan).

These works help to retain the natural land drainage regime and provide the best soil conditions for the continued agricultural use of the land. Examples of good practice for reducing surface water runoff from agricultural land are:

- Ploughing fields in a perpendicular direction to the slope of the land, reducing the effect of channelling of water over the land when it rains
- Using techniques and machinery to limit compaction of soils
- Growing crops that match the capability of the land, particularly in relation to the timings of activities and not overworking soils through the year
- Providing new ditches, sub-soil drainage and outfalls, and reinstating and regularly maintaining existing ditches. Old existing ditches may be completely filled and difficult to see. The type of soil make-up, type of flora and overall lie of the land can help to determine the routes of filled in historic ditches
- Preventing changes to the levels of the land that would cause channelling of surface water to a single point where this would not naturally occur.

It should be noted that following good practice for managing surface water runoff cannot completely remove the risks of natural land drainage and the associated quantities and flow routes of runoff that can cause flooding.

6. DISCLAIMER

The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

Any recommended actions outlined in this FIR will be for the relevant responsible body or persons to assess in terms of resource implications, priority and cost/benefit analysis of the proposal. Moving forward, these may be included in the Action Plan linked to the Local Flood Risk Management Strategy or in the relevant risk management authority's future work programme as appropriate.

The opinions, conclusions and any recommendations in this Report are based on information provided to Vale of White Horse District Council and Oxfordshire County Council.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Vale of White Horse District Council and Oxfordshire County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommendations.

The implications for producing Flood Investigation Reports and any consequences of blight have been considered. The process of gaining insurance for a property and/or purchasing/selling a property and any flooding issues identified are considered a separate and legally binding process placed upon property owners and this is independent of and does not relate to the information in this report highlighting flooding to properties at a street level.

Vale of White Horse District Council or Oxfordshire County Council do not accept any liability for the use of this report or its contents by any third party.

ACRONYMS

VWH Vale of White Horse District Council
OCC Oxfordshire County Council
EA Environment Agency
TW Thames Water
FIR Flood Investigation Report
F&WMA Flood and Water Management Act 2010
LDA Land Drainage Act 1991
LLFA Lead Local Flood Authority
WRA Water Resources Act 1991

USEFUL LINKS

Highways Act 1980:
www.legislation.gov.uk/ukpga/1980/66/contents

Water Resources Act 1991:
www.legislation.gov.uk/ukpga/1991/57/contents

Land Drainage Act 1991:
www.legislation.gov.uk/ukpga/1991/59/contents

EA - Prepare your Property for Flooding:
How to reduce flood damage Flood protection products and services
www.gov.uk/government/publications/prepare-your-property-for-flooding

EA - Long term flood risk service:
https://www.gov.uk/check-long-term-flood-risk

EA - Sign up for flood warnings:
Sign up for flood warnings - GOV.UK (www.gov.uk)

EA - Up to date information on flood alerts & warnings:
Check for flooding - GOV.UK (www.gov.uk)

Oxfordshire County Council Flood and Water Management Web Pages:
www.oxfordshirefloodtoolkit.com
https://www.oxfordshire.gov.uk/residents/fire-and-public-safety/emergency-planning/community-resilience

Flood and Water Management Act 2010
http://www.legislation.gov.uk/ukpga/2010/29/contents

USEFUL CONTACTS

Oxfordshire County Council Highways:
Tel: 0345 310 1111
Website: www.fixmystreet.oxfordshire.gov.uk

Environment Agency:
General Tel: 08708 506 506 (Mon-Fri 8-6) Call charges apply. Incident Hotline: 0800 807060 (24 hrs)
Floodline: 0345 988 1188
Email: enquiries@environment-agency.gov.uk

Thames Water
Emergency Tel: 0800 316 9800 (select option 1)
Website: www.thameswater.co.uk/help-and-advice/bursts-and-leaks/report-a-leak- orburst-pipe