

Report on river flooding in Whitchurch-on-Thames in January and February 2014

Updated edition, 10th August 2020



by
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Preface

This report describes the River Thames floods of January and February 2014 and the investigations afterwards. Three separate flood-related events, listed below, occurred during these floods. The first is not preventable but avoidance action can be taken on the second and third.

1. **The rise and fall of the Thames** – *This flooded gardens and threatened properties already known to be at risk. The scale of the flood event in a historic context is discussed in Chapter 1, together with the difficulties of preventing entry of flood water into properties.*
2. **Flooding of Eastfield Lane** – *A restriction of the culverted village watercourse on property south of Eastfield Lane caused floodwater to back up and escape from a roadside drain, flooding the road and nearby gardens. This could have been prevented if the culvert had been maintained, as explained in Chapter 2.*

Recommendation: *work with the owners of land through which the watercourse passes, whether culverted or not, who are ‘Riparian Owners’ and are responsible for its function and maintenance.*

3. **Sewage escape and toilet flushing problems** – *The Eastfield Lane sewage pumping station’s capacity was briefly overwhelmed during each of the two flood peaks. This was caused by an ‘unauthorised’ ingress of surface water into the foul system. Thames Water subsequently investigated this event and installed telemetry to help identify the entry point. This is discussed in Chapter 3.*

Recommendation: *work with TW towards ensuring surface water does not enter the foul system.*

Related documents

*In an earlier edition of this report there were various Appendices containing detailed information and photographs. These have been updated and placed in a separate document entitled “**Flooding in Whitchurch – Background Notes**”.*

*The flash flood of June 2020, which caused damage inside The Greyhound, is dealt with in a report entitled “**Flash Flooding in Whitchurch on 16th June 2020**”.*

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Introduction

This report summarises the knowledge gained during and after the river flooding of 2014, in the belief that it will prove useful to the community in the future when another similar or greater flood sweeps down the Thames valley.

Detailed information of a range of topics relevant to local flooding has been collated in a separate document: “**Flooding in Whitchurch – Background Notes**”. Topics include the ‘mysterious’ village watercourse, local topography and geology, historical flood events and water levels, man made changes to ground levels in the High Street, water table behaviour, road drains, culverts in private ownership, etc, including information that has come to light following the flash flood in June 2020.

The flood of 2014 had two periods when the river level peaked, one in January and one in February. The peak in each case was equivalent to a flood which might be expected on average once in five or ten years. However, the overall flood event lasted for an unusually long time, delaying by three months the reconstruction of the toll bridge, which had started in the autumn of 2013. The three photographs in Figure 1 show the river in flood on 6th January (upper two photos) and 23rd January (lowest photo) 2014.

During the two flood peaks a number of low-lying properties were affected and some elevated properties were isolated. Mill Drive was flooded. Part of Eastfield Lane was covered by flood water rising from a roadside drain, affecting pedestrians and access to two properties. Sewage erupted from a kitchen sink external drain in Eastfield Lane and other properties reported slow flushing of ground level toilets. The private road extending Eastfield Lane towards the river was also flooded.

Once the flooding had subsided, parish councils in South Oxfordshire were asked by John Backley, SODC facilities manager, to report on how the flooding affected their area. In response, a preliminary version of this report was submitted by Whitchurch parish council to SODC later that year.

Acknowledgments

This report has been written by two long-term village residents, John Southey and Richard Wingfield. Thanks are due to many individuals who have provided their observations, including photographs, maps and access to their property. Sri Srirathan of Monson Ltd, along with employees of OPC (OCC’s drainage contractor), who on 18th January 2014 investigated what lay beneath various manhole covers and road grilles. A subsequent meeting with Dave Baldwin at Crowmarsh Gifford filled in more gaps. Staff of the Thames Water Customer Resolution department were most helpful in confirming their actions in January and February 2014. Information on river levels is from the Environment Agency.



Figure 1 - Views of the river in flood, January 2014. Upper, from the Dolphin Centre car park; middle, from the temporary pedestrian bridge; lower, Eastfield Lane from the air

1 - The rise and fall of the Thames

This chapter reviews the 2014 flood in the context of earlier major floods. It also discusses the use of sandbags for protection of properties.

River levels and historical precedents

Figure 3 below shows the two periods in January and February 2014 when the river was at its highest. Further river level graphs are shown in the separate document containing 'Background Notes'.

In this and related documents, flood levels are quoted in metres above Ordnance Datum, abbreviated to 'mAOD'. (*Note: the Environment Agency website quotes flood levels as heights above the datum of the local measuring station.*)

Table of historic flood levels

The peak river levels at a point immediately downstream of the lock for five flood events are shown in the table below. Also included in the table for interest are the dates and rankings of other historic flood events, taken from a paper of 2004 from the UK Centre for Ecology and Hydrology, Wallingford, which examined the long period of records kept at Shillingford Wharf, not far upstream from Whitchurch.

Flood event in year shown	Peak river level (mAOD)	Probable ranking
1809		Highest recorded
November 1894	40.82	2 nd highest
1821		3 rd highest
1768		4 th highest
March 1947	40.57	5 th highest
1852		6 th highest
Jan-Feb 2014	40.27	7th highest
Jan 2003	40.16	
July 2007	39.93	

The rankings must be regarded as approximate. Direct comparison between historic floods is complicated by changes made over the years to the level and shape of river weirs, by changes in channel shape caused by siltation and dredging, and by land use changes.

The 1947 event has been regarded by the Environment Agency as the benchmark for the '100 year flood', which is the flood with a return period of 100 years, or with a 1% probability of occurring in a given year. This event had a particular characteristic as it occurred when there was a sudden thaw in the catchment after a winter of heavy snowfall

on frozen ground. The melting snow could not drain into the ground and unusually high levels of run-off occurred.

The table indicates that four earlier events may have exceeded the 1947 flood. For one of these (1894) there is a flood mark on the Whitchurch lock keeper's cottage, showing the upstream water level at just beneath the window ledge.

The authors would like to suggest that a flood marker for the 1947 event should be made and fastened to the wall at The Greyhound to remind residents of the flood risk.

Ordnance Survey maps of Whitchurch show a 41 mAOD spot height, corresponding to the benchmark engraved into the wall of the old fire station beside The Greyhound in the High Street. See Figure 2 below.

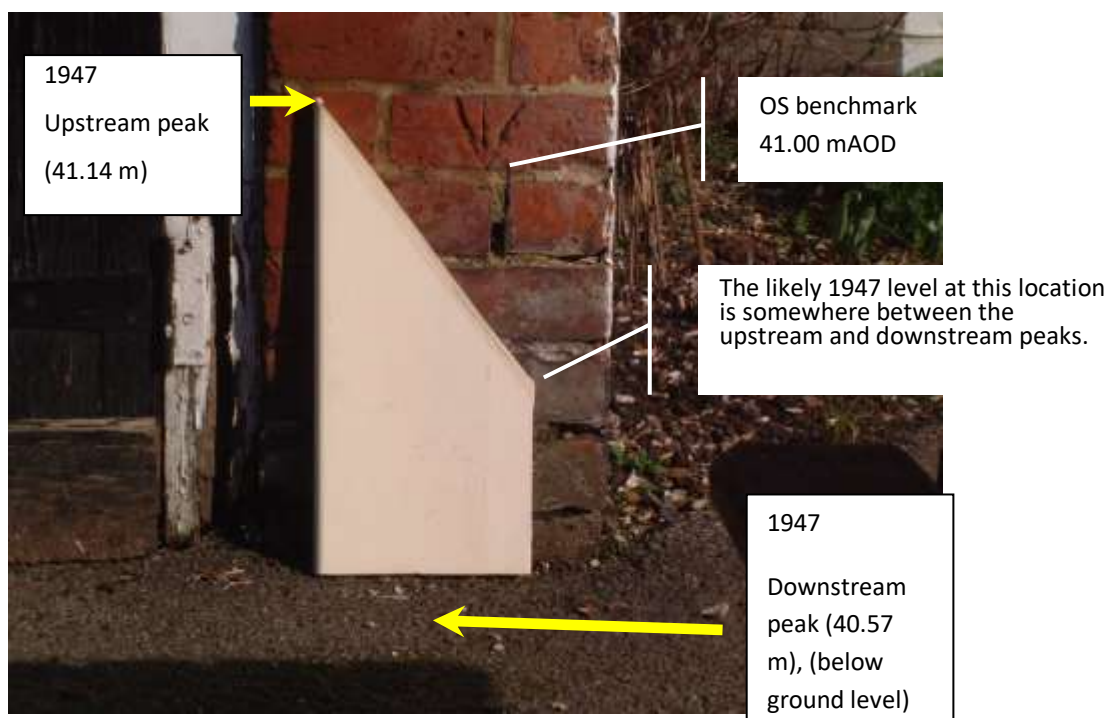


Figure 2 – Estimating the 1947 flood level at The Greyhound

Figure 2 also shows an estimate of the peak water level in 1947. It could not have been lower than the downstream river peak level, nor higher than the upstream. The assumption that it was about midway between those levels seems reasonable.

Properties in the village that were flooded in 2014 experienced considerably lower levels than they would have done in 1947. In 2014 the peak levels were around 300 mm lower than those of 1947 so did not cause the widespread flooding of 1947, which covered the area in the vicinity of The Greyhound. However, the flash flood of June 2020, which was caused by a rainstorm and was independent of river flow, provided a glimpse of what this larger scale flooding would have looked like as it filled the “Greyhound bowl” to a maximum depth of around 350 mm.

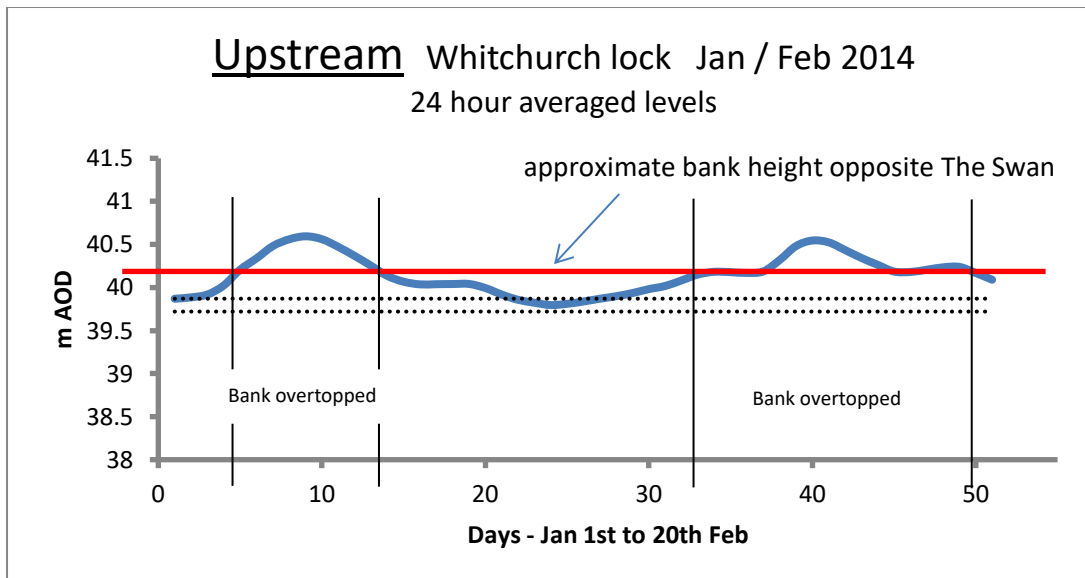


Figure 3 – Two periods when the bank upstream of the weir was overtopped

In Figure 3 the range of normal river levels is shown by the pair of dotted lines.

Protecting properties

The slow rise, long duration and slow fall of a Thames river flood makes it difficult to protect properties at risk in low lying areas. Floodwater will seep through the ground itself and into the foundations, as well as flooding across gardens. Sandbags are not good at preventing this, unless backed up by other measures such as membranes and pumps. However, sandbags are good at diverting running water or for short term relief during flash flooding. Diversion of running water is illustrated by photos in Chapter 2, Flooding of Eastfield Lane.

The SODC website now advises: *“Homeowners have responsibility for protecting their own properties from flooding – we do not routinely supply sandbags during times of flooding. You should note that sandbags are often not the most effective solution to flood prevention, and you should research what would work best for your property.”* Further information is offered here: <http://www.southoxon.gov.uk/services-and-advice/environment-and-neighbourhood-issues/severe-weather/flooding> .

Oxfordshire County Council offers information on all aspects of flood risk in its recently published Flood Toolkit: <https://www.oxfordshirefloodtoolkit.com/> .

2 - Flooding of Eastfield Lane

This chapter deals with the reasons behind the flooding of one area of the village and describes the two independent drainage systems that operate there. It covers investigations made after the flood

Source and destination of the water

During the flood, river water flowing along the village watercourse from above the weir (and therefore under the influence of the higher river level upstream of the weir) emerged from drains at:-

- The large manhole cover outside the old fire station in the High Street
- One, possibly two road drains in Eastfield Lane
- A manhole cover in the front garden of Chiltern Edge
- A manhole cover to the side of Chiltern Edge
- A manhole cover in the rear garden of Chiltern Edge

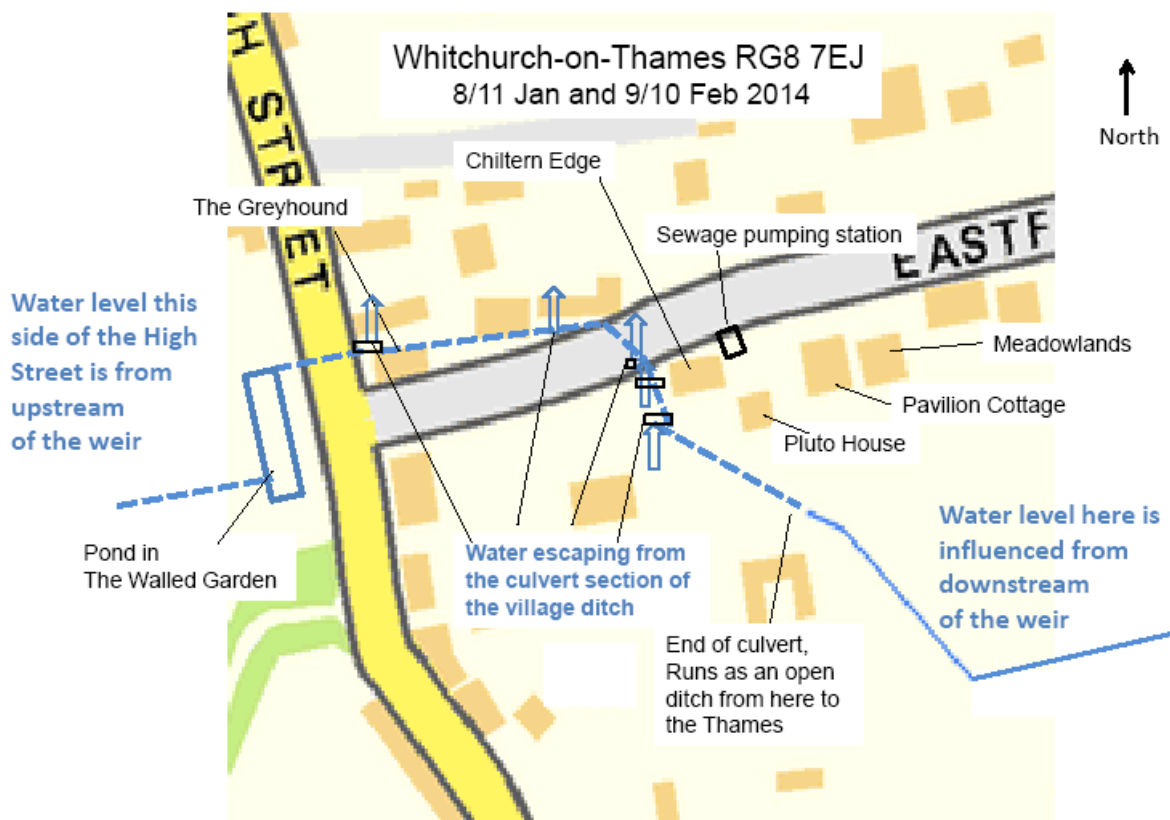


Figure 4 – Street plan showing (in blue) the route of the culverted village watercourse and where floodwater emerged



Figure 5 - Schematic of the two road drain systems in Eastfield Lane, looking north

The escaping water, unable to flow as intended along the culvert southwards and then south-eastwards towards the river, flowed east along Eastfield Lane. Most then flowed south between the houses until it met Thames floodwater, at a level influenced by the river below the weir, creeping up the rear gardens of the houses.

Some of the escaped water running east along Eastfield Lane was accepted by a roadside drain outside Pluto House, which flows eastwards and then turns south in a 150mm diameter pipe, as shown in Figure 5, about 350m in length, heading for the Thames independently from and downstream of the village watercourse. Surface water flowing along this "Pluto House" drain slightly reduced the amount of water lying on the road, but its flow was hindered by frequent blockage of the drain grille by leaf litter.

For a brief period during the flood peaks in January and February a length of Eastfield Lane was impassable to pedestrians without boots.

Fortunately, the small volume of water escaping from the manhole cover outside The Greyhound in 2014 was insufficient to enter the pub. By contrast, during the 2003 river flood the pub was flooded by a similar escape of Thames flood water that backed up along Eastfield Lane, crossing the slight watershed outside The Gables, as the result of an inadequately sized culvert south of Eastfield Lane, that had been constructed privately in around 1999. That culvert was subsequently replaced by SODC in 2003, using a larger 450mm diameter one. See "Flooding in Whitchurch - Background Notes".



Figure 6 - Floodwater in Eastfield Lane on 10 January 2014

The tidemark visible in Figure 6 indicates that the floodwater was close to flowing over the watershed outside The Gables and then threatening the High Street.



Figure 7 - Water from the restricted culvert flowing around the garden level room of Pavilion Cottage, Eastfield Lane

In Figure 7, the downstream-influenced water level in the back garden, to the left of the picture, is around 400 mm lower than the upstream-influenced level of water flowing out of the culvert and down into the front garden.



Figure 8 – More effective use of sandbags to divert water during the February 2014 peak

Figure 8 shows water from the partly blocked culvert being successfully diverted from running into the front garden of Pavilion Cottage by sandbags laid across the entrance.

With the benefit of hindsight, this was partly a road drainage issue and should have been brought to the attention of OCC Highways to solve, in addition to using SODC's sandbags to alleviate the symptoms.

Sandbags

Sandbags were delivered to Eastfield Lane by SODC in response to requests by the Parish Council in January 2014. Some can be seen in use in Figures 7 and 8.

Sandbags are useful for diverting running water, but on their own will not prevent ingress of standing water. In the event of a prolonged period of high water levels, as in a Thames flood, they need to be backed up by membranes and pumps.

See Chapter 1 for more on the use of sandbags, including sources of advice.

Responsibility of Riparian Owners

The OCC website states: *“Oxfordshire County Council is responsible for coordinating the management of flood risk from surface water, groundwater and ordinary watercourses. However, this does not mean that they can or will undertake works to fix a flooding issue, but they can investigate to find out who the Riparian Owner is and therefore who is responsible; and advise on potential solutions. The cost of any works to fix these flooding issues will be charged back to the responsible person or organisation.”*

The SODC website has this to say on the Riparian Owner’s responsibilities: *“A riparian owner is responsible for accepting water from their upstream neighbour and transferring this, along with any existing drainage from their own property, freely, to their neighbour downstream”*.

Investigation into the cause of the culvert restriction south of Eastfield Lane

The cause of the flooding in Eastfield Lane in 2014 was a partial restriction in the drainage culvert downstream of the roadside drain, somewhere between the last manhole in the rear of the garden of Chiltern Edge and the culvert’s exit at Pavilion Cottage where it meets an open ditch. This was a preventable occurrence. Regular inspection and maintenance is recommended to ensure it does not happen again.

This culvert can have water lying in it for months after a flood event as it does not seem to be free draining. The presence of water causes difficulties for a CCTV survey. The reason for the failure to drain properly is being investigated (August 2020).

The open ditch from the culvert exit at Pavilion Cottage to the rear garden of the adjacent property, Meadowland, was subsequently cleared later in 2014 and a silt trap dug at the culvert exit.

By September 2015, the water table had dropped sufficiently to enable a closer examination from the garden of Pavilion Cottage. A piece of chestnut paling fence was found some two metres into the culvert from where it discharges into the ditch, along with accumulated leaf litter. This was cleared using drain rods, although it was not easy to dislodge.

This may have been a partial cause of the blockage which caused flooding of Eastfield Lane. The only way is to confirm the extent to which the culvert is free-flowing is to examine the full length from the ditch outfall back to the roadside manhole at Chiltern Edge. A topographic survey along the full length of the village watercourse is also recommended to properly understand the hydraulic constraints on the system.

3 - Discharge of sewage

This chapter describes the most serious aspect of the 2014 floods, which is one for which action can be taken to avoid a repetition.

During both the flood peaks, the pumping station at Eastfield Lane was overwhelmed by the ingress of a substantial volume of surface water. This filled the sump of the pumping station and its pumping capacity was insufficient to deal with the rate of ingress. The head in the sewerage system became unusually high, filling sewers at some distance from the facility. Some ground level toilets became slow to flush and one property experienced a discharge of raw sewage from their kitchen sink external drain on both occasions.

Thames Water refers to such an event as an “unauthorised discharge of surface water”. Despite investigations, including an aerial survey, the source has not been identified as far as is known. From the timing and pressure, it is thought that the entry point lies somewhere west of the High Street, above weir level. It seems possible that an inspection pit cover was lifted in an attempt to drain floodwater. Thames Water have since installed telemetry in relevant sections to give them early warning and help trace the source.

The village’s foul system is not designed to take surface water, though it can cope with minor seepage during times of flood. The fact that Eastfield Lane happened to flood adjacent to the pumping station is a coincidence and has been ruled out as the cause.

All the village’s sewage is treated at a facility in Manor Road, after which the treated effluent flows to the river. Water from sinks, baths, and toilets from above Manor Road flows by gravity to the treatment plant and sewage from below Manor Road is collected and transferred uphill via the pumping station in Eastfield Lane. The Eastfield Lane pumping station has sufficient storage and reserve pumping capacity for short term peaks / power outage / pump failure etc. At the time of both discharge incidents, both the duty and reserve pumps were in working order. Thames Water are understood to have replaced one pump recently as a precaution

Thames Water welcome reports of any unusual flow behaviour – slow flushing of ground floor toilets for example. This helps them understand what is happening locally. They say the more reports they get the better. **Thames Water’s contact number is 0800 216 9800.** See also Appendix B.

As an incidental point of interest, Whitchurch house owners who contact Thames Water to confirm that their rainwater does not enter the foul system can claim a reduction in their water charges.

Appendix A – Minutes of meeting with SODC, 20th May 2014

Whitchurch-on-Thames Parish Council

Minutes of Meeting on Tuesday 20 May 2014 at SODC offices, Crowmarsh Gifford

Present: Ann Ducker, Leader SODC
Pearl Slatter, Councillor SODC
Harry Butterworth, Chairman Whitchurch PC
John Southey, Whitchurch Flooding & Drainage Forum
Richard Wingfield, Whitchurch Flooding & Drainage Forum.

1. **Purpose of meeting.** To progress actions coming out of a village report on the Jan/Feb 2014 flooding and those from a meeting on 1 May at SODC offices between Dave Baldwin (of Monson Ltd), John Southey and Richard Wingfield. Dave Baldwin was unable to be present on 20 May.
2. **Report.** A preliminary draft of the illustrated report, prepared by John Southey and Richard Wingfield, has been circulated electronically. The title is “*Report on flooding in Whitchurch-on-Thames, January and February 2014. Draft 30 April 2014.*”
3. **Culvert survey.** Funding is sought by the village for a camera survey of the surface water drainage culvert which passes east-west under the village on an uncertain route. It is thought that there is a restriction of some sort towards the downstream end and that this caused the flooding in Eastfield Lane during the recent flood events. The connection between the culvert and the road drainage system also needs clarification. Ann Ducker confirmed that such investigation work would not come under the government’s funding for flood remediation measures nor would SODC fund it, so it would be up to the parish to find funding. She recommended involving all the landowners before any survey as the responsibility for any remediation work on a culvert on private land would be the landowner’s.
4. **Old drawings of road drainage.** Dave Baldwin was going to ask Gordon Hunt of OCC if he knew of any layout drawings of the road drainage in Whitchurch. To be followed up.
5. **Land ownership along culvert route.** From upstream to downstream the land ownership is thought to be as follows:
see below
 - The Walled Garden House. The flow enters the large pond in the garden at its southern end and flow out from its north-eastern corner under the garden wall and across the road towards the Greyhound.
 - *OCC Highways (under the High Street)*
 - The Greyhound (Punch Taverns,)
 - The Gables
 - No 1 Eastfield Lane
 - No 2 Eastfield Lane
 - *OCC Highways (under Eastfield Lane)*

- Chiltern Edge
 - Pluto House
 - Pavilion Cottage The culvert ends at the boundary of Pluto House and Pavilion Cottage and discharges to an open ditch which leads to the Thames.
6. **Silt trap at the Greyhound.** ***see below* The silt trap outside The Greyhound has been recognised by OCC Highways as their responsibility and maintenance action is scheduled for 22 May. Mike Smith of OCC has arranged for the contractor to tell RW the time of this visit so that he or JS can attend. The connection between silt trap and culvert is unclear.
7. **Sewage in gardens.** During the recent flood peaks, the sewage pumping station in Eastfield Lane was overwhelmed by ingress of surface water into the sewage collecting system. This caused flushing difficulties for many houses and in at least one property there was sewage emerging from a kitchen waste gully in the garden (May Cottage). The PC is concerned at this situation, especially as the Eastfield House care home is about to be much enlarged. Ann Ducker suggested involving MP John Howell in order to obtain confirmation from Thames Water that the pumping facilities are adequate.

Minute by RW, 21.5.14

****Note added August 2020:** In this list the two furthest upstream landownerships are not mentioned. These are Walliscote farm land, since acquired by the owner of Hopton, and The Walled Garden Retreat.*

*****Note added August 2020:** The underground brick chamber accessed via a manhole outside the old fire station at The Greyhound was, at the time of the above meeting, assumed to receive road drainage and to function as a silt trap. However, observations during the flash flood of 16th June 2020 demonstrated that it does not do so and that the two drainage systems are independent. It appears that at some time in the past it might have been used to receive road drainage into the village culvert, but that has not happened in recent times.*

Appendix B – Minutes of meeting with Thames Water, 26th September 2014

Whitchurch-on-Thames Parish Council Note of Meeting with Thames Water on Friday 26th September 2014 in the Village Hall, to discuss drainage problems

Present: Harry Butterworth, Chairman of Whitchurch Parish Council
Keith Brooks, Vice-chairman of Whitchurch Parish Council
John Southey (retired MIMechE)
Richard Wingfield (retired MICE)
Andrew Hagger, Asset Management and Network Modelling, Thames Water
Kelly Trussler, Customer Representative, Thames Water

1. Mr Southey explained that flushing problems (slow discharge of toilets) had developed in various parts of the drainage system during floods in January and February this year and that the pumping station had appeared unable to cope. He indicated where sewage had escaped from the collector system, including a continuous fountain at May Cottage coinciding with each of the two peaks of the flood hydrograph. He questioned whether the pumping station at Eastfield Lane had sufficient capacity given modern water usage, more houses, more intense storms and the forthcoming Eastfield House care home development.
2. Mr Hagger said TW would prefer to identify the locations of ingress of surface water into the foul system rather than increase the pumping capacity. He said the pump station, which has two pumps but only one working at any one time (i.e. 'duty standby' rather than 'duty assist'), has had sufficient capacity in normal conditions. He would consult helicopter film footage which should show the peak flood extent in January/February this year as that could help find ingress locations, especially in the part of the village influenced by the river level above the weir.
3. Mr Hagger said TW will consider installing a number of telemetry units at manholes within the collector system, which can indicate either head or flow. These would enable the problem to be properly analysed next time there is a river flood or an intense rainfall event. He will also send an electronic version of the tabled plan of the village showing the foul drainage pipeline routes; also the levels of manhole covers.
4. Mrs Trussler said TW wants to encourage householders to report poor flushing or emerging sewage by means of their **24 hour reporting line 0800 216 9800**. TW finds such reports useful, she said. The PC will prepare a circular which could be distributed to all households with the Bulletin.
5. Mr Wingfield said that the role of the village's land drainage system, partly hidden from view, needed to be understood and was being investigated. It consists of a stream linking upstream and downstream reaches of the river, which crosses under the High Street at The Greyhound. The channel, which has been gradually culverted in recent centuries, can bring water at a head close to the upstream flood level (which

was 40 cm higher than downstream in the Jan/Feb flood conditions) towards the centre of the village. Currently there appears to be a restriction in the culvert somewhere south of Eastfield Lane which probably exacerbated the flooding of Eastfield Lane during the Jan/Feb floods. However the fountain occurring at May Cottage did not seem to be generated by the flow in the land drainage system.

6. Mr Butterworth raised a separate problem of large tanker trucks causing heavy wear and some damage to Manor Road as they regularly transport sludge from the sewage treatment plant. TW agreed to investigate the size and frequency of truck journeys and to consider using smaller trucks.
7. Mr Butterworth and Mr Brooks thanked the TW representatives for coming to discuss the village's problems and said they looked forward to hearing further about reducing ingress, installing instrumentation and mitigating the heavy truck problem.

Note prepared by RW for Whitchurch Parish Council, 29th September 2014

Note added in August 2020: In the event of a repeat of the problem in the future, the comments below from Thames Water may be of interest.

Thames Water encourage people to report sewage problems whenever they occur. These help them build up a picture of the situation and allocate resources accordingly.

*We urge residents to contact us directly on **0800 216 9800** if they have any issues with backing up of sinks, toilets or slow drainage of facilities. We will come out and check the system and carry out work needed to stop the issues. In times of extreme weather, sometimes we have to prioritise our work.*

We do monitor areas both by post code and types of issues reported. If we notice a pattern of issues over time we may look at carrying out further investigation.

If the pumping station was to become overloaded and either not be able to cope with the volumes of water and sewage, or fail, we will again come out and carry out the necessary repairs and assist households where possible. However, if the situation is extreme we sometimes need to wait for the levels to recede before we are able to carry out any work.

Yours sincerely

Lynn Parks, Customer Resolution