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Ask for:
Your Ref:
Our Ref:
Date:

Dear Member

KENT FLOOD RISK MANAGEMENT COMMITTEE - MONDAY, 17 NOVEMBER 2014

I am now able to enclose, for consideration at next Monday, 17 November 2014 meeting of the Kent Flood Risk Management Committee, the following report(s) that were unavailable when the agenda was printed.

Agenda No	Item
4	<u>Southern Water response to Winter 2013/14 Floods</u> (Pages 3 - 32)

Yours sincerely

A handwritten signature in black ink, appearing to read 'Peter Sass', is written over a light blue horizontal line.

Peter Sass
Head of Democratic Services

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To: Kent Flood Risk Management Committee – 17th November 2014

From: Michael Harrison, Chairman of Kent Flood Risk Management Committee

Subject: Southern Water response to Winter 2013/14 floods

Classification: Unrestricted

1. Background

1.1 Following the flooding in Winter 2013/14 Cabinet requested a paper to explore the issues that arose and identify areas for improvement. The paper that was produced included 17 recommendations, it was tabled at Cabinet on 7th July 2014 and formally approved. This paper was reported to Kent Flood Risk Management Committee on 21st July 2014.

1.2 Recommendation 13 of the report was for “EA / Southern Water to respond to queries / concerns regarding the perceived lack of / effectiveness of their rivers & flood management systems / assets”. Paul Crick, Director of Environment, Planning and Enforcement, wrote to Matthew Wright, Chief Executive, Southern Water, to ask him to explain what Southern Water had done in response to the flooding. His response is included in Appendix 1 of this report.

1.3 The Environment Agency is due to publish a report into the winter flooding.

2. Recommendations

That Members:

- Note the Southern Water letter (Appendix 1); and
- Consider any matters arising from the letter.

Michael Harrison, Chairman of the Kent Flood Risk Management Committee

Contact Officer: Max Tant, Flood Risk Manager 03000 413466
max.tant@kent.gov.uk

Background documents: Report to Cabinet on the Christmas / New Year 2013/14 Storms and Floods (7th July 2014)

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Paul Crick
Director of Environment, Planning and Enforcement
1st Floor, Invicta House
County Hall
Maidstone
Kent
ME14 1XX

Your ref

Our ref

MW/EC

Date

24 October 2014

Contact

Tel 01903 272393

Fax

Dear Paul

I am writing in response to your letter dated 29th September 2014, requesting that Southern Water provides you with information on how we responded to the flooding experienced during the winter of 2013-14. We are committed to working with other flood risk management authorities across our region, including Kent County Council (KCC), and as such welcome the chance to comment on last winter's flooding. In doing so, I would first like to stress that in 2013-14 Southern Water:

- Engaged regularly with Lead Local Flood Authorities (LLFAs), the Environment Agency (EA) and other flood risk authorities across our region, actively taking part in Flood Risk Management Boards and the Southern Regional Flood and Coastal Committee.
- Worked in partnership with other agencies and as part of a multi-agency response to winter flooding across our region.
- Was an active Steering Group Member on a number of flood and coastal erosion projects across the south east.
- Invested heavily (more than £5M) to survey and seal sewers and manholes in areas susceptible to groundwater flooding.
- Conducted an extensive programme of work to seal sewers, where we identified significant leaks, not just in our sewer system but also in some customers' lateral drains. This meant that we only needed to deploy tankers after higher groundwater levels were reached in many areas, when compared with previous flood events.
- Developed in-house, and deployed our unique Eco-Filter process, to reduce the impact on discharges to streams and watercourses.
- Improved our sewer network serving a number of vulnerable areas, so that it was better able to withstand infiltration from groundwater.

In direct response to each of the subjects you have specifically raised queries on, I would like to update you as follows:

Published reports on floods occurring due to our assets

Annually under Section 18 of the Flood and Water Management Act 2010, the EA has a duty to report on flood risk management and mitigation. Along with other water and sewerage companies, Southern Water provided a report to the EA in April 2014 that outlined progress over the previous financial year. There was significant emphasis on the issues surrounding the 2013-14 flooding, but we highlighted the good progress on infiltration reduction and other flooding related investment that has been made, or is ongoing.

The final 2013-14 report was issued by the EA on 19th September 2014 and can be viewed via <https://www.gov.uk/government/publications/managing-flood-and-coastal-erosion-risk-april-2013-to-march-2014>. It clearly cites Southern Water's previous work to reduce groundwater infiltration (through sewer and manhole sealing) and the positive impact that this had during the 2013-14 floods. It also refers to the cost of 2013-14 flooding and the £20M total flood response spend by our organisation.

There was reference in the EA report to £6M worth of investigations and repairs during 2013-14, including in villages along the River Nailbourne, and the benefits of such investment being seen in many catchments across our region during the winter. It referred to Southern Water only needing to use tankers when higher groundwater levels than previously experienced were reached. Nevertheless, tankering and over-pumping costs peaked at around £150,000 a day, with more than 330 staff involved and 117 tankers in use. Indeed, at its peak Southern Water was pumping out around 125 million litres a day of excess water from its sewerage system – enough to fill 50 Olympic sized swimming pools.

This goes some way to demonstrate the extreme conditions that were experienced and dealt with by our workforce throughout Kent, Sussex, Hampshire and the Isle of Wight. Groundwater levels were at a record high during the wet weather of 2013-14, resulting in 40 groundwater flooding locations across our region.

Asset improvements to prevent flooding

In 2013-14, Southern Water invested more than £6 million to survey and seal sewers and manholes in areas susceptible to groundwater flooding across our region. As part of our Wastewater Pumping Station Total Care Programme, we have Total Care Plans (TCPs) identified for 500 sites selected in favour of pollution and flooding. The Programme started on March 2013 and some 470 sites had TCPs completed by the end of December 2013, reducing the risk of future pollution events and flooding. The TCP work has focussed on driving resilience and performance, but a small number of sites (less than 10) within the Programme were impacted by groundwater during 2013-14.

Increased sewer network resilience

During the current 5 year Asset Management Period of investment covering 2010-15, we have undertaken resilience assessments of our key assets, in order to identify where these require enhanced protection and justified future investment. Certain operational sites, such as Sandown Water Supply Works, were flooded by surface water during the 2013-14 wet weather. Those few operational sites that were actually flooded during 2013-14 continued to operate, despite the severe weather conditions.

As well as contending with flood waters, storm conditions had a significant impact on our assets during 2013-14, with some 250 pumping stations losing power during the Christmas

2013 storm alone. To counter this risk, we routinely undertake criticality assessments on our sites to determine the impact of power outages. Such assessments include reviewing vulnerability to power outages, as well as the impact of outages on customers and/or the environment.

Where the frequency and consequence of outages is deemed unacceptable, e.g. it results in internal flooding or a serious pollution incident, then a permanently installed generator is required. Where the frequency of outages is low or has minimal impact, then we rely upon mobile generators, which are located at strategic centres such as Ashford, Maidstone and Tonbridge. Alternatively we use tankers to take the flow from pumping stations and discharge it at local wastewater treatment works. Our experience over the last winter has shown our risk based approach to be effective and has not required us to install additional generators.

Other measures to prevent flooding

We have been working in a number of other ways to help prevent flooding. Being actively involved in a number of flood and coastal erosion projects across our region has helped to better inform these projects, provide valuable input and guidance and also to maximise protection of our own assets. LLFAs have valued our input and representation on their respective Flood Risk Management Boards, as well as the Southern Regional Flood and Coastal Committee. Drawing upon lessons learnt during previous floods, including the West Sussex 2012 floods, we have worked well with LLFAs and other flood risk management authorities to respond to the unprecedented weather conditions experienced across the south east during 2013-14.

Our collaboration with other flood risk management authorities has influenced our planning investment, in both the current (2010-15) and the next 5-year Asset Management Period (2015-20). From 2015 we plan to focus on wider adoption of Surface Water Management Plans, adoption of technology to allow integration of different flood mechanisms and real time management of the 'whole drainage' network. We also want to ensure that there is a clearer understanding of roles and responsibilities for all parties going forwards and to maintain partnership working, including multi-agency responses.

In addition, as a result of its effectiveness, we wish to continue our programme of surveys and repairs, to develop proposals for seasonal overflows with tertiary treatment and to continue to develop Infiltration Reduction Management Plans where necessary across our region.

Work with local communities to explain the risk and improve resilience

Our involvement with local communities has been prominent in those areas of our region where the flooding of 2013-14 was particularly severe. In Kent, a key part of our focus is in the County centred upon the Nailbourne Valley, where we have been working closely with authorities such as parish, borough, district and county councils, the Environment Agency and river management group to jointly resolve the problems caused by groundwater flooding. The following is a summary case study outlining our work on flood protection in village communities along the Nailbourne:

Nailbourne flood protection scheme

Work began in early 2013 on a £1 million programme to tackle the problem of high levels of groundwater flooding the sewer network in villages along the Nailbourne

Recent flooding

We were recently using five tankers and five temporary pumps to remove wastewater from the sewers serving the villages along the Nailbourne.

Investigations

In 2013, engineers used remote operated CCTV cameras to extensively survey over ten kilometres of sewers and 250 manholes. Sources of groundwater infiltration were identified. The main locations were:

- Bridge, near Brewery Lane and Mill Lane
- Bourne Park, at Bishopsbourne
- Charlton Park
- Barham
- Substantial leaks were also found elsewhere along the valley.

Between Sept 2013 and Jan 2014, over 3.5 km of sewers were repaired.

We are working closely with authorities such as parish, borough, district and county councils, the Environment Agency and river management group to jointly resolve the problems caused by groundwater flooding.

Benefits

Due to the severity of the flooding this year, the repairs were not able to eliminate groundwater entering the sewers, but Southern Water did not need to start using tankers until the groundwater level at Little Bucket borehole had risen to 80m, compared to a level of 78.5m in 2013 when tankering commenced.

Biological treatment units have been installed at four of the five over-pumping locations along the bourne, to improve the quality of the water being discharged.

Planned Work

A flow monitoring survey to identify remaining areas of infiltration will be carried out when groundwater levels fall slightly.

Contribute to a Surface Water Management Plan led by the lead flood Authority.

A study will be carried out in Spring 2014, of the potential for an emergency discharge at an appropriate location in the catchment. The discharge would include some elementary treatment.



Geographical coverage of our improvements

In your letter you have stated that the geographical areas where residents have raised questions for Southern Water are Tonbridge, Five Oak Green and the villages of the Nailbourne Valley and have asked where else we have undertaken improvements in response to the 2013-14 floods. In relation to the 2013-14 floods in Kent and associated improvements that have been identified or implemented since, I would like to take the opportunity to update you on key geographical locations as follows:

Nailbourne Canterbury area - This was the worst impacted area in 2013-14, where the sewerage system was inundated with groundwater during the winter. To ensure drainage within the system, Southern Water needed to over pump the sewerage system at five locations: Barham, Bishopsbourne, Patricxbourne, Bekesbourne and Littlebourne. In addition, we utilised tankers at various locations including Barham, Patricxbourne and Bridge. We have previously invested in sewer sealing to reduce the level of infiltration, and this has proved effective as the requirement for over pumping was reduced, i.e over pumping commenced at a higher groundwater level than previously experienced and also ceased when the groundwater level was higher than previous events. Since the event we have installed non-return valves at key properties, which will prevent them from flooding due to the sewerage system backing up. We have also refurbished the major pumping station, School Lane. The station now has more modern variable speed pumps and new control equipment. This will allow the station to operate at the maximum possible for the downstream sewer capacity. Although not yet tested under high groundwater levels, it is likely that it will pump more than prior to its refurbishment, thus reducing our reliance on the over-pumping.

Nailbourne Elham area – Southern Water experienced inundation of the sewerage system in both Elham and Ottinge last winter. This was the first such event since the winter of 2000-01. To ensure the free drainage of the sewerage system, we over-pumped diluted wastewater (c.90% groundwater) from The Orchards Pumping Station into the Nailbourne. To minimise the impact of this discharge, we installed a temporary treatment facility to improve the discharge quality. We have since undertaken a CCTV examination of the sewerage network and as a result will be undertaking jetting of parts of the sewerage system to remove fat build up and root ingress. We will be replacing a sewer liner, previously inserted in the sewer pipe to seal the sewer, as it has been distorted and is no longer effective. In addition, we will be sealing three manholes where infiltration has been identified. This work will be completed during the Autumn of 2014. We are also investigating the possibility of isolating a section of the sewerage system, prone to flooding under high groundwater conditions, and servicing the area by tanker.

We are looking at the possibility of providing temporary pumping of a small section of the sewerage system in Ottinge to allow permanent drainage to all properties in the catchment. This review will be completed by the end of October 2014 and if suitable the solution will be implemented in November 2014. In this catchment we have replaced a number of manhole covers that were submerged by groundwater, with sealed units, this will prevent the ingress of significant amounts of water.

Petham Bourne - The Bourne was evident again last winter, which is the first time since the winter of 2000-01. The high ground water level caused surcharging of the sewerage system leading to discharging from two manholes in the grounds of the Stiner School, near Chartham. In recognition of this, Perry Court Pumping Station, has undergone refurbishment over the spring and summer of 2014 and the opportunity has been taken to up-rate its pumping capacity by a factor of three. We believe that this improvement will be sufficient to maintain free drainage in the system and should prevent the overflowing of the manholes in the future.

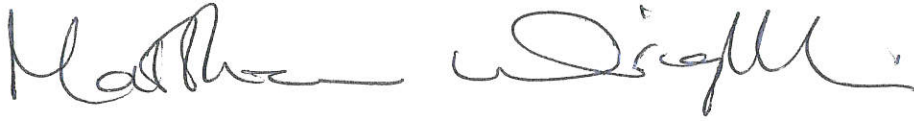
Alkham Valley - Our sewerage system suffered infiltration as a result of the high groundwater levels in 2013-14. Although not as severe as elsewhere, this led to some external flooding and several customers suffering restricted toilet use. We assisted by using tankers as required. A CCTV survey undertaken, after the flows had subsided, did not show any points of groundwater ingress.

Preston & Elmstone - We have replaced a number of manhole covers with sealed units to prevent surface water ingress. In addition, a number of sewers have been jetted to ensure that operate at full capacity. The operation of Court Lane Pumping Station allowed flows to back up in the catchment and cause some garden and highway flooding. As a result of this, the station was overhauled to ensure it operates at maximum capacity. Court Farm Pumping Station had previously undergone refurbishment, but its reliability is not as good as we would like and so we are considering the option to replace it with a conventional submersible pumping station.

Ickham and Wickhambreaux - the majority of the issues in this location during 2013-14 were associated with fluvial flooding from the Nailbourne, which caused our wastewater pumping station to fail and prevented an immediate response. We are currently reviewing an appropriate means of protecting the site with bespoke flood protection barriers, which is complicated by its location at a road junction.

I hope that you find this response to your queries useful. Should you have any further questions or concerns on any aspect of our flood risk management work then please feel free to contact me again.

Yours sincerely

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Matthew Wright
Chief Executive Officer

Kent County Council Flood Risk Management Committee



November 2014



Paul Kent

Wastewater Strategy Manager

Martin Banks

Sewerage Policy Manager



Agenda



- Southern Water's role in flood management
- Impact of winter 2013/14 flooding
- General improvements
- Area specific flooding
- Preparation for winter 2014/15
- Flood protection methods

Flooding – Regional Involvement



- Engage with Lead Local Flood Authorities
- Actively involved in Flood Risk Management Boards and Southern Regional Flood and Coastal Committee
- Member of Steering Group on flood and coastal erosion projects
- Involved with Surface Water Management Plans
- Work closely with Environment Agency, District Councils and local communities

- Aiming for the development and delivery of holistic solutions to flooding problems

Impact of Winter 2013/14

- The autumn/winter weather first impacted with the St Jude storm event (28th October)
- Problems faced, included pluvial, fluvial and tidal flooding, high winds, widespread power outages and access difficulties
- Worst of the protracted issues were associated with high groundwater levels and infiltration into the sewerage system
- Required tankering and over pumping to alleviate sewer surcharging
- Became a 24/7 response with our own staff and contractors, at peak, expenditure of £150k/day, 330 staff involved and almost 120 tankers in use (across Kent, Sussex, Hampshire and Isle of Wight)

Improvements to Date

- Flood Alleviation Schemes (property protection)

- Dover (Brookfield Place)
- Maidstone (Buckland Road)
- Tunbridge Wells (Camden Road)
- Gillingham (Cherry Tree Road)
- New Romney (Station Approach)
- Benchley (Fairmans Lane)

46 properties prevented from flooding - £7.5m

- Infiltration Reduction

- Inspected 10km of sewers 250 manholes
- 3.5km sewers repaired last year
- 4km sewers repaired in previous years

- Total Care Plans

- Commenced in 2013 to improve reliability of our wastewater pumping stations
- Stripping and inspecting every pump and valve - repairing/replacing where necessary
- Full electrical inspection of panels/ MCC - repairing/replacing where necessary



Example of Improvements



Village	Location	Issue	Action/Result	Date
Ottage	Manholes off Canterbury Road	Surface water ingress through leaking manhole covers	Existing 20 covers replaced with sealed covers	Jun-14
Ethan	Hag Green	Root ingress in sewer	Root removal and sewer sealing	2014 (Q4)
	Between Canterbury Road and Hag Green	Root ingress in sewer	Root removal and sewer sealing	2014 (Q4)
	Hag Green	Persistent unexplained	Replace sewer lines	2014 (Q4)
	The Ockhads	Class inferential casts	Repair sewer	
	Between Hag Lane and The Ockhads	Class inferential casts	Repair sewer	
Barkon	Valley Road	Infiltration (leaking joints)	Get sealing of sewer	2005/06
	The Greenway/Devington Street	Infiltration	Sewer sealing	2013
Egpton	North west of village	Infiltration (leaking joints)	Get sealing of sewer	2005/06
		Infiltration	Sewer sealing	2013
Bishopsbourne	Cladon Park and The Street	Infiltration (leaking joints)	Get sealing of sewer	2005/06
	Bourne Park	Infiltration (leaking joints)	Get sealing of sewer	2005/06
	Cladon Park (vicinity of cricket pitch)	Significant infiltration	Get sealing and lining of sewer	Oct-11
Bishopsbourne	Cladon Park (vicinity of Brown's Cottage)	Significant infiltration	Sealing, lining and O-lock installation	2013
	Cladon Park (vicinity of Brown's Cottage)	Significant infiltration	Get sealing of sewer and spray coating of manholes	Mar-11
	Leak sewer through the village	Significant infiltration	Re lay sewer	Sep-12
	Park Lane	Significant infiltration	Sewer lining	2013
			Use sewer at end of Old Post Office	Jul-14

Bishopsbourne

Bourne Park

Sealing and lining

Village	Location	Issue	Action/Result	Date
Bedge	Bourne Park Road	Infiltration (leaking joints)	Get sealing of sewer	2005/06
		Infiltration (leaking joints)	Get sealing of sewer	Aug-11
		Infiltration (leaking joints)	Get sealing of sewer	2005/06
	Fotickouree Road	Infiltration	Sewer sealing	2013
		Infiltration	Sewer lining	2013
Fotickouree	Private drive (vicinity of Fotickouree Road)	Significant infiltration	Get sealing of drive made stable by construction	Sep-12
	Behind south of Bowers Lane	Sewer manholes in the field floods to land	Replace 20 covers with sealed covers	Jun-14
	Bowers Lane/Bedge at Way	Infiltration	Sewer sealing	2013
	Old Palace Road and Fotickouree Road	Infiltration	O-lock installation and manhole sealing	2013
Bekesbourne	Manholes in the vicinity of Court House and Riverside Cottages	Ingress directly from the Mill House	Existing 20 covers replaced with sealed covers	Jun-14
	Properties to south east of village	Property protection	Installation of manhole valves	2014 (Q4)
	Old Palace Road	Infiltration (leaking joints)	Get sealing of sewer	2013
School Lane	School Lane	Infiltration	Sewer sealing, manhole sealing	2013
	School Lane Pumping Station	Refurbs mechanical and electrical equipment	Pumps and control panels replaced	2014 (Spring)
Pumping Stations	Ottage	Can the output from the station be increased?	Review capacity of rising main	
	The Ockhads Pumping Station	Can the output from the station be increased?	Limited by capacity of Ottage PS	Mar-14
	School Lane Pumping Station	Can the output from the station be increased?	Refurbishment will increase flows to 1.25 l/s, suggested that downstream sewer capacity is 200 l/s. Also need to consider impact on Newham Valley WWTW	
	Haggate Street Pumping Station	Can the output from the station be increased?	Currently 34 l/s, maximum incoming capacity 48 l/s, potential to increase to 96 l/s but need to consider use of capacity of downstream sewer	

Bekesbourne

School Lane

Pumps and control panels replaced



Site Specific – Nailbourne – Canterbury Villages



Nailbourne

- Tankering commenced January and over pumping/tankering ceased May
- Typically sequential, commence with tankering, when flows are in excess of tankering capability, then resort to over pumping
- Over pumping at 5 Locations
 - Barham (and tankers)
 - Bishopsbourne (and tankers)
 - Patrixbourne (and tankers)
 - Bekesbourne
 - Littlebourne
- Discharge rates 20-50l/s
- In addition to the above locations, tankers utilised at Bridge

Nailbourne – Elham and Ottinge

- In Elham and Ottinge two events recorded
 - 2000/01 - wettest year on record
 - 2013/14 – wettest winter on record
- Groundwater infiltration leading to restricted toilet use and flooding in Water Farm
- Alleviate flooding and protection of Affinity Water source by over pumping
- Undertaking jetting, sealing manholes, root removal and replacement of previous liner that has failed, possibility of protecting Water Farm with a non-return valve



Elham and Ottinge (cont)

■ Ottinge

- Managed surcharged sewers by tankers
- Undertaken raising/sealing/replacement covers for 8 manholes



- Plans to replace tankers with temporary pumped discharge directly to Ottinge Pumping Station

Over pumping

Groundwater levels impacted by rainfall events, when levels are very high it causes surcharging of the sewerage system

- prevents free drainage, can lead to flooding and restricted toilet use
- Address by removing excess flows by tankering or over pumping
- Due to volume of groundwater in the sewers, over pumping only means of realistically managing the sewerage system
- Approval sought from the Environment Agency prior to commencing
- Discharge quality similar to that of some of our wastewater treatment works

Bio-treatment units



- Developed in-house
- First of their kind in the Country
- Improves the quality of the discharge



Suction Screening



Improves the quality of the discharge and prevents pump blockage



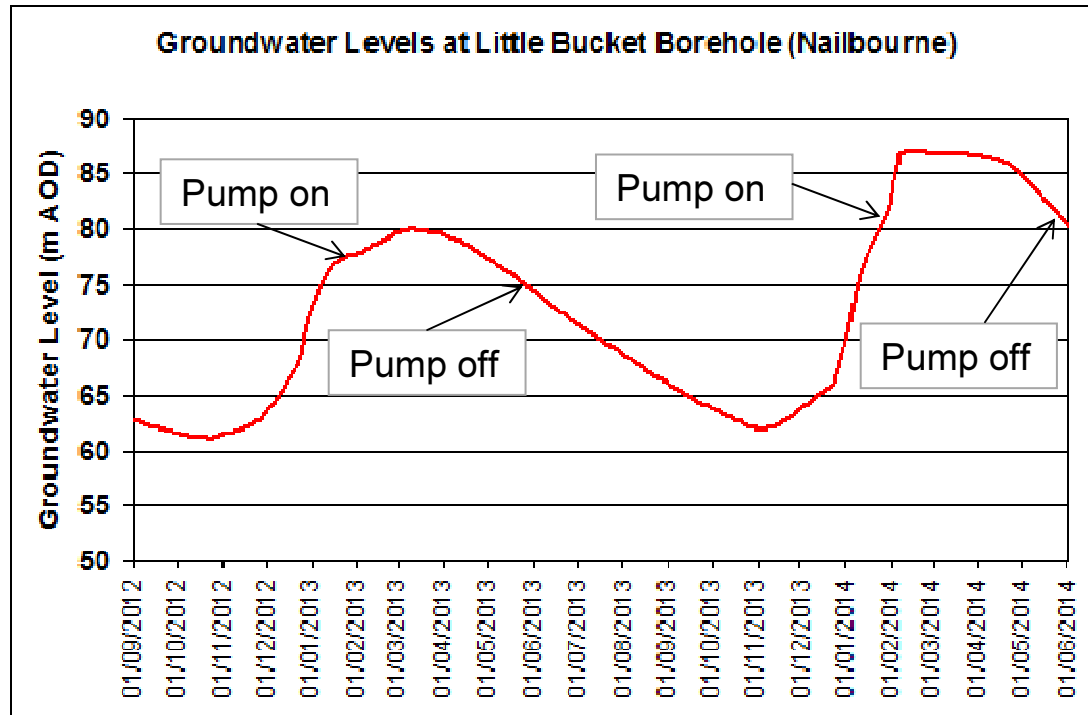
Effluent Screening



Improves the quality of the discharge by fine screening



Nailbourne Improvements



Above suggests that investment has proved successful, over pumping intervention started later and finished earlier than previous year with respect to groundwater levels.

Petham Bourne

- Flooding from manholes in the grounds of the Stiner School
- First occasion since 2000/01
- Water ingress and reliability/capacity of pumping station believed to be the cause



- 8 manholes, repaired, sealed or water tight covers fitted
- Pumping station refurbished, pumps replaced with modern day equivalent, threefold increase in capacity

Five Oak Green and Tonbridge

Five Oak Green

- Historic flooding has been associated with the reliability of Larkfield pumping station. Refurbished several years ago and since proved reliable
- The problems in the winter of 2013/14 were associated with the surface water system. Our investigations highlighted the following issues;
 - downstream water courses restricting flow, causing backing up and flooding from the system
 - partial blockage in the surface water system causing surcharging and flooding
 - heavy deposits in the attenuation tank, causing loss of storage
- Issues now addressed

Danvers Road/Barden Road, Tonbridge

- Flooding in this area dominated by fluvial flooding associated with the River Medway, led to overloading of both the foul and surface water sewerage systems
- We have since undertaken jetting of the surface water sewers to remove any sedimentation

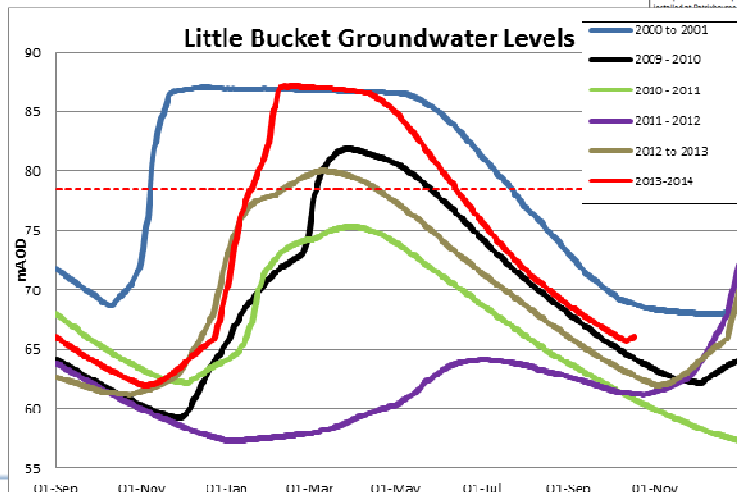
Other Locations

- Alkham Valley
 - Experience of some garden flooding and restricted toilet use, addressed with tankering as and when required. Post event cctv failed to identify any groundwater ingress locations.
- Preston and Elmstone
 - Overloading believed to be from surface water, manhole covers replaced
 - Court Lane pumping station refurbished
 - Court Farm PS refurbished, unfortunately little improvement in reliability, considering replacement
- Ickham and Wickhambreaux
 - Protection of Drill Lane pumping station from fluvial flooding



Preparation for Winter 2014/15

- Proactive preparation, should tankering over pumping need to be deployed, produced Operational Incident Plans per location/village
- Nailbourne specific is the continued interaction with LSNRMG with a view to continuous improvement, through the infiltration reduction plan (IRP)
- Undertaken preventative work to minimise groundwater infiltration volume
- Installed protection measures to prevent flooding to properties (e.g. non-return valves)
- Refurbished and improved vulnerable pumping stations



		OPERATIONAL INCIDENT PLAN	1.4	COUNTY & ISSUE AREA: EFFECTIVE DATE:	Bridge, Nailbourne, Kent
INTERNAL		KEY CONTACTS		TRIGGER LEVELS	
<ul style="list-style-type: none"> SW Incident Team Kent flooding lead Kent East FIT Clancy DOWRA 		<ul style="list-style-type: none"> EA (Canterbury) Canterbury City Council Environmental Health & Engineering Departments Kent County Council Highways Department The Little Stour & Nailbourne River Management Group Bridge Parish Council 		<p>Little Bucket Borehole in the Nailbourne is used to monitor groundwater levels. Tankering operations started when the borehole level reached 80mAOOD in 2014, compared to a level of 78.5mAOOD in 2013. (Note that this level is used as an indicator only and should not be relied upon as a predictor of sewer surcharge.)</p> <p>Regular inspection of the level of flow in the sewer, once the trigger level has been reached, will determine the need for tankering or in extreme events, over pumping.</p>	
<p>The village of Bridge lies within the Newbarn Valley WTW catchment, alongside the Nailbourne watercourse. The catchment population is approximately 6800, with 81.8km of both pumped and gravity sewer services the area. This sewer ranges in diameter from 100-450mm. Villages in the Nailbourne area have suffered from a history of flooding. Flows to the WTW suggest groundwater levels have a significant influence on sewer flows, and as such tankering and overpumping have been used in the past.</p> <p>SW operates a small pumping station at Riverside Close in Bridge. A sewer monitor is located at the Riverside Close.</p>		BACKGROUND		TANKERING DETAILS	
				<p>Tankering took place at Riverside Close between February and June 2013.</p> <p>In 2014, tankering took place at Riverside Close (regular tankering from No. 56 and one load daily from No.5).</p> <p>Tankering operations took place from No's 68 and 70 on the High Street (first time in 2014) - one load daily. (Both customers claimed to have suffered internal flooding but apparently cleaned up themselves so no action required from SW.)</p>	
		CUSTOMER		OVERPUMPING DETAILS	
		<p>at No. 3, 9-27 Riverside Close.</p> <p>contact/complaint from 3 / 5 / 7 / 13 / 15 / 58 / 60 Riverside TU to garden and road flooding; internal flooding at 76 The 2 / 104 The High Street & Beech Hill; No.5 Riverside Close and noise from tankers; Brewery Lane sewers affected.</p>		<p>In 2014 an over pump unit was used at Patsbourne Road (MH7601). However, this was deemed to be an extreme response for the level of sewer surcharging that was experienced and only used for one week.</p> <p>If over pumping to be used at this location then warning signs (of over pumping) should be placed downstream of the discharge. A regime of regular sampling and analysis should be agreed with the EA.</p>	



Flood Protection Methods



- We undertake flood mitigation to approximately 100 properties/year, typically where the cost of a permanent solution is excessive or not cost beneficial
- Mixture of methods
 - Garden re-profiling
 - Water tight doors
 - Airbrick covers
 - Flood barriers (in keeping with the property e.g. purpose made wooden gates)
 - Non-return valves
- Non-return valves most common protection
 - Provide protection against backflow from main sewer
 - Fitted on a priority basis and only where they will provide benefit
 - Not normally suitable for protection against long duration flooding events
 - Need to understand the risk of flooding transfer (better external than internal flooding)

Questions?



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