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11 September 2019

Dear Councillor Spalding

THAMES WATER RESPONSE TO COUNCIL SCRUTINY RECOMMENDATIONS

Thank you for the invitation to speak at the Royal Borough of Kensington and Chelsea's Public Realm Scrutiny Committee meeting on 23rd July 2019 and your subsequent letter dated 1st August 2019.

We very much appreciated the opportunity to hear from the committee members and the members of the public who were present at the meeting and to explain our new proposals which no longer involves the construction of a tunnelled sewer.

Our response to your recommendations in your letter of 1st August is given below. For ease of reference, each recommendation is indicated in blue with our response underneath in black. A question raised at the Scrutiny Committee, but not included in your letter, related to the robustness of FLIP solutions as a long-term solution. We have responded to this question in the final section of this communication (item number 7).

We should state that our new proposal and the decision not to build the tunnelled sewer were also explained in our letter dated 12th February which had been prepared in response to the Council's letter dated 25th January 2018. Further additional information in this respect was also provided in March 2018. In order to bring all the information relating to this matter together and for your ease of reference, I have attached these previous correspondences.

1. Thames Water to provide more information on the SuDS being implemented upstream in other boroughs;

   The sewer network in Kensington and Chelsea is part of the North London catchment which drains into the Beckton Sewage Treatment Works. The North London catchment comprises 19 boroughs. In your above recommendation it is correctly recognised that the flows from the upstream boroughs in North London have an impact on the sewer network in Kensington and Chelsea. However, it is equally important to note that the flows from the downstream boroughs can also have an impact. For example, if a large intensity rainfall reaches the downstream boroughs first before moving onto the Counters Creek catchment, the downstream sewers can potentially fill up which may in turn result in the flows from Kensington and Chelsea not being able to drain freely.

Our future plans include implementation of Sustainable Drainage Systems (SuDS) in all of the 19 North London boroughs which includes Kensington and Chelsea and all the upstream and downstream boroughs.

We are creating an opportunity to deliver SuDS in partnership with the councils and as part of our draft submission to Ofwat will ring fence £150k for 2 years (2020-2022) for each council to apply for SuDS funding. A very simple assumption is £75 per square metre which means that 0.2 hectares can be delivered per £150k investment. As mentioned earlier, there are 19 boroughs in North London, so there could be around 4 hectares of SuDS implemented using Thames Water funding. It is also estimated that another 2 hectares can be implemented in North London in collaboration with the other third parties (like developers).

A further investment of £6m (approximately 6 hectares) is also planned to be made in one of North London boroughs. The selection of this borough will be based on the hydraulic benefits achieved in respect of the sewer network. Both Kensington and Chelsea and Hammersmith and Fulham have not been shortlisted for this £6m investment.

Similar investments to the above are being made in respect of the South London catchment and the Thames Valley region.

Notwithstanding the above, it is worth noting that there have already been significant investments in SuDS within the Counters Creek catchment, not only as part of the Counters Creek Flood Alleviation scheme but other Thames Water initiatives. Further details of this are included in our response to your second recommendation below.

2. Thames Water to redouble its efforts to roll out such schemes in the Counters Creek catchment areas;

We did redouble our efforts to roll out SuDS within the Counters Creek catchment after 2015. You may recall that we started by the implementation of the three SuDS schemes at Melina Road, Mendora Road and Arundel Gardens under the Counters Creek scheme. At the same time, we explored other opportunities outside the Counters Creek scheme. This led to the implementation of SuDS at White City (West Way and Australia Road), Queen Caroline Street and Field Road in collaboration with the developers. We then introduced new SuDS investment following the decision not to proceed with the Counters Creek Storm Relief Sewer; this resulted in the implementation of SuDS at Greenside Road, Godolphin Road, Munster/Eddiscombe Road, Rostrevor Road, Bassein Park/Wendell Road.

I am sure you would agree that the above works amount to a significant investment already.

At the scrutiny meeting it was noted that the SuDS investments have been mainly in Hammersmith and Fulham and not in Kensington and Chelsea. This is because our investments were governed by the hydraulic benefits to the sewer system and the development opportunities available in the catchment and not by borough boundaries.

In addition to the above, the massive investment in the Thames Tideway Tunnel due to be commissioned in 2024 is worthy of consideration. Although the primary objective of this project is to improve river water quality, there will be some hydraulic benefit to the sewer network and its future resilience.

We believe that with the amount of investment made we have provided viable flood protection to the properties impacted by flooding in the Counters Creek catchment. In the future, Thames Water will continue to prioritise its investment based on customers' needs.

3. Readiness to share the Independent Advisory Group report's findings and the WSP findings;

Please see below a statement provided by the Independent Advisory Group. The WSP summary report is included in the attached documents.

"The IAG have been informed by Thames Water that in considering the current proposal to address the flood risk in Counters Creek by a solution essentially involving FLIPS and local sewer upgrading schemes, OFWAT considers the scheme to be cancelled. We have been asked for our opinion on this specific point. The IAG does not agree with this point of view – to be clear, we do not consider the scheme to be cancelled. In arriving at our view, we have taken into account the following:

1. *The proposal originally presented to OFWAT in the Change Protocol, which formed the basis of the final determination of the AMP6 business plan (FDBP), included a mix of different measures including a tunnel (commonly referred to as the Strategic Tunnel), local sewer upgrading proposals and FLIPs. The present proposal retains two of these elements.*
2. *In the FDBP the defined customer benefit was to provide protection to 1766* (see note at bottom of page) properties where flooding had been recorded. We understand that the current proposal will deliver a substantial part of this customer benefit.*
3. *There have been significant changes to the local environment and to the understanding of current system performance that justify the reasons for a major review and development of alternative strategies for managing flood risk in the area."*

NOTE * From the 1766 properties we have protected 1031; from the remaining 735 properties, 439 had not been impacted by sewer flooding and 296 were not interested in our offer of protection despite our repeated requests. The reason for the 296 customers not being interested could be that they had either not experienced any sewer flooding or had converted their basements and provided their own protection as required under the current Building Regulations.

Following our catchment investigations and customer contacts we found that around 100 properties in addition to the 1766 properties had also been impacted by flooding. These 100 properties are being protected by our current proposal.

4. Thames Water sharing information on the scale of the risk in Royal Borough of Kensington and Chelsea and in which streets this risk was greatest.

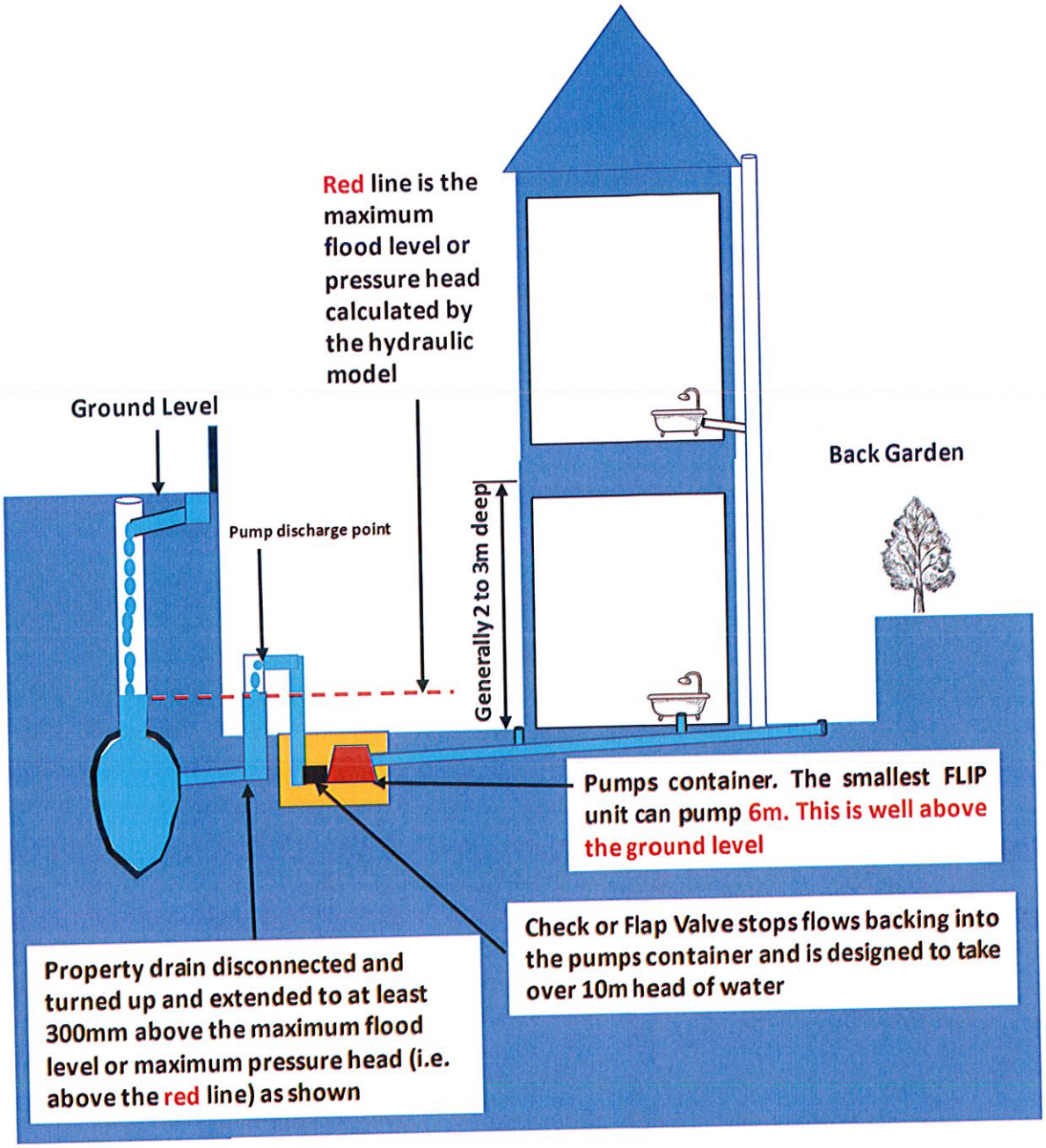
   The enclosed document entitled "Streets protected by FLIP devices" shows the total number of properties protected in the streets through FLIP installations.

   We have addressed the issue of reported sewer flooding. Generally, the other basements (namely those without any reports) do not seem to have been impacted by sewer flooding in the past based on our customer communications and consultations. There is therefore no reason to think that these other basements will be at risk in the future. The risk of future sewer flooding should therefore be limited along any street irrespective of the number of FLIPs installed in that street.

   There are several reasons for basements not to have been impacted by sewer flooding in the past; the basement is higher than the neighbouring basements, the basement is not connected to the property drain (i.e. the basement is just a cellar), the property is already protected by a flap valve or the customer has implemented flood protection measures when converting the basement.

5. Thames Water to provide data of a technical nature on the levels of water pressure the FLIP devices and non-return valves could cope in storm events (1 in 30yrs, 1 in 40yrs, 1 in 50yrs events);

   At the meeting there seemed to be some confusion in respect of the way FLIP devices operate. The diagram and the explanation on the following two pages should help to clarify this matter.



- The red line on the diagram indicates the maximum anticipated design water level (or static pressure) in the sewer. The level of the red line is calculated using the hydraulic model based on a rainfall intensity of 1 in 30yr return period plus an allowance for climate change. **Based on the hydraulic model, in this catchment, the red line is generally below the ground level but above some of the basement levels.**
- The connection pipework from the property into the basement is disconnected and taken above the red line as shown in the above sketch.
- The FLIP device pumps the flows higher than the red line. As you can see from the above diagram the pump discharge point is higher than the red line by a minimum of 300mm.
- Therefore, as you can see, the flows from the sewer cannot back into the FLIP device.

- If a more intense rainfall than 1 in 30yr return period is experienced and the red line (or pressure) rises, then the flows can back into the FLIP device, but the Check or Flap Valve shown on the above diagram would prevent the flows entering the pumps container.
- **The smallest FLIP device can pump to a head of 6m**. The basements are approximately between 2 and 3m deep, therefore the pumps can pump to a level well above the red line and also well above the ground level. This means that even under the extreme circumstances of the rainfall intensity exceeding 1 in 30yr return period, the pumps can continue to pump the flows through the Flap Valve into the sewer. **The Flap Valve can take pressures higher than 10m which is again well above the red line and ground level**. Below is a web link to the FLIP supplier's Technical Data Sheet (Compli 1000 range):

  https://www.jung-pumps.co.uk/wp-content/uploads/2018/12/JUNG-PUMPEN-COMPLI-1000.pdf

- For rare rainfall events such as a 1 in 40 or even 1 in 50yr return period, the FLIP devices will continue to prevent sewage flooding, but please remember that the gullies in the road (which are the responsibility of the Highway Authority) are unlikely to be able to cope with such large rainfall events. This means that the surface water run-off will not be able to enter the sewer system and will therefore flood the highways. The surface water from a flooded highway may lead to over-land flooding impacting the light wells leading to basements, possibly resulting in basement flooding. This kind of flooding is not caused by the sewer but short-comings in the capacity of surface drainage such as highway drainage.

6. Confirmation of Thames Water's endorsement that large areas of permeable surfaces are vital to flood mitigation

London is a built-up area and provision of large areas of permeable surfaces are generally feasible through development opportunities. Conversion of built up areas to permeable surfaces do have a positive impact in the reduction of flows into the sewer network and can create headroom for climate change.

Thames Water supports the provision of permeable surfaces through development opportunities and will continue to work with the developers and planning authorities for the implementation of these. Thames Water support the requirements of Policy 5.13 of the London Plan and Policy SI13 of the Draft London Plan July 2019 which require development to utilise SuDS and to follow the drainage hierarchy. Thames Water also support the London Sustainable Drainage Action Plan 2016 which sets out a long-term strategy and actions for increasing sustainable drainage implementation.

7. Additional information:

At the meeting concern was expressed about the robustness of FLIPs as a solution, seeing them as more of a short-term solution to localised basement flooding. A statement by Thames Water in relation to its previous proposal of constructing a storm relief sewer was read out. In the statement Thames Water had indicated that FLIPs do not address the surcharge within the sewerage system and that a storm relief sewer, as a long-term solution, was required.

Thames Water have been installing FLIP devices routinely as permanent installations. Indeed, FLIPs were also part of the previous solution which included the tunnelled sewer. These devices do not address the surcharge within the sewerage system but prevent the flows backing up the property connections resulting in containment of the flows within the sewer system. FLIPs are robustly engineered and with the appropriate regular maintenance carried out by Thames Water have a long service life. All installed devices become part of Thames Water's asset register, and are maintained and serviced as appropriate, including emergency call out.

The presentation attached to this communication, and submitted to the Council previously, summarises the maintenance regime, providing statistics on number of units visited between 2017 and 2018. Thames Water believes that the maintenance, both preventative and reactive, is robust.

With respect to the Thames Water statement read out at the meeting, we now have more information on the basements and a better understanding of the flooding mechanism. We do believe that FLIPs are a robust solution for the following reasons:

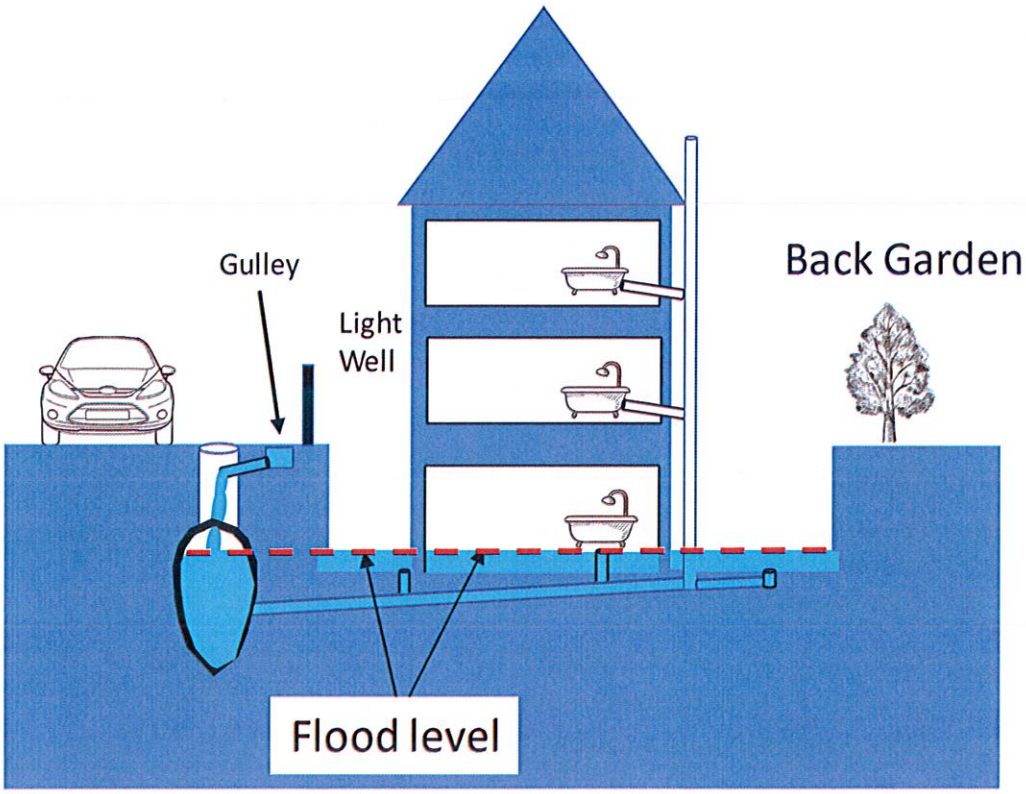
a. The number of reported flooding incidents in recent years particularly after the rainfall events of June 2016 and May 2018 have reduced significantly. This has demonstrated that the FLIPs installed within the catchment have been effective. Indeed, Thames Water have been installing FLIPs since early 2000 and a review of their past performances has demonstrated that they do offer a robust and long-term solution.

b. The Storm Relief Sewer had been designed for a 1 in 30 year return period rainfall. As explained under item 5 above, a FLIP device can continue to protect the basements even if the rainfall intensity goes beyond 1 in 30 year.

c. Our new proposal includes extensive SuDS measures as explained under item 2 above within the catchment. Many of these were not in our original proposal which included the Storm Relief Sewer. The new SuDS reduce the flows into the sewer network and work together with the FLIP devices to provide a robust and long-term solution.

d. When we further investigated the basements, we found that the storm relief sewer could not protect many of the basements. This is because we found that

many basements were as deep as the local sewer in the road. Therefore, in intense rainfall, the flows could back up from the local sewers into the basements irrespective of the operation of any Storm Relief Sewer. The diagram below should help to better demonstrate this critical point:



- The flood level is indicated in red. We found that at many locations the basements were at a similar level to the sewer. As you can see this means that water can back up into the basement before the sewer is full.
- To prevent flooding, the flows had to be diverted from the local sewers to lower the red line. This would have resulted in extensive works being implemented whilst our assets were not even at full capacity.
- The proposed Storm Relief Sewer had five connection points to the sewer network. This would have meant that the flood level or the red line could be lowered to below basement levels only in the vicinity of these connection points. The flooded basements are spread over a large area. It was neither practical nor viable to connect the local sewers, many of which were located away from these connection points into the proposed storm relief sewer. Therefore, the storm relief sewer on its own had limited impact on flood protection.

I hope the above information has addressed your recommendations but if you have any further queries please do not hesitate to contact me.

Yours sincerely

Martin Hoff

Head of Major Projects, Thames Water