Internal Review into the 12 and 25 July 2021 storms in London

Actions taken, lessons learnt and further actions to be taken

November 2021

This Thames Water report summarises our Internal Review of the actions taken before, during and after the storms of 12 and 25 July 2021 in London. The report also outlines the lessons learnt and the measures the company will take to mitigate the impacts of similar events in the future.

1. Overview

On 12 and 25 July, large parts of London were hit by intense storms which resulted in the flooding of many homes and businesses as well as a number of schools, hospitals and London Underground stations. On both occasions, the severity of the storms was more than expected and our customer service fell short of what people should rightfully expect.

We have carried out a rigorous Internal Review to examine the actions taken ahead of, during and after the storm. This has identified where we could and should have done better, and the measures required to ensure we are better prepared and able to respond to future intense storms, given the increasing likelihood of such extreme weather in the future.

The two key areas in which we let our customers down were in our initial response on the ground, and how we could have better supported those trying to contact us.

In parallel, we have commissioned an Independent Review into the causes and impacts of the flooding, with a detailed assessment of how our sewer systems performed. This Independent Review will also identify actions for Thames Water and other flood risk management partners on how, individually and collectively, we can make London more resilient to extreme rainfall. We expect the Independent Review to complete in Spring 2022, with interim reports as it progresses.

It is our intention to include an update on the actions identified in this report with our response to the findings of the Independent Review.

2. Executive summary

Background to the July storms

The Met Office provided 'yellow' weather warnings[1] ahead of both the 12 and 25 July storms, forecasting a range of rainfall intensities, covering the whole of the south east region. The forecast for the 25 July storm was upgraded to 'amber' during the storm.

The Met Office records show that the rainfall on both days was exceptional. On 12 July, a month's worth of rain fell in an hour and on 25 July, a month's rain fell in a couple of hours. The sewer flooding in west London on 12 July was worsened by high tides that coincided with the storms, closing the combined sewer outfalls, preventing the system from overflowing into the Thames.

How did we respond to the storms?

As is standard when weather warnings are issued, we convened proactive 'adverse' weather meetings with our operational teams to assess the risk to our services, customers and the environment. Given the uncertainty of how much rain would fall and where, we followed the Met

[1] An explanation of the Met Office's weather warnings can be found at www.metoffice.gov.uk/weather/guides/warnings

Office's 'most likely' forecast of 20-30mm of rain and its prediction of 'low likelihood of medium impacts'. We prepared actions based on the expected scenarios and ensured that all relevant teams were aware of the risk. The rain that subsequently fell across London was far in excess of this forecast.

Our Customer Contact Centre response

Due to the exceptional events on 12 and 25 July, we received more than double the number of daily expected telephone calls and contacts via social media, in just a few hours. This overwhelmed our Customer Contact Centre and led to unacceptably long waiting times, with many customers hanging up.

Our communications with stakeholders

We always aim to keep key elected representatives proactively informed as this helps our partners and our customers respond to incidents. In not being able to better estimate the severity of the 12 July storm, we did not proactively communicate with the elected representatives in the affected areas, which led to them having to contact us and mixed messages being issued. Following the lessons learnt from the 12 July storm, we engaged with the councillors and MPs ahead of the 25 July storm and all partners received better aligned customer communications.

Our operational response to the storms

On the evening of 12 July, the London Resilience Group convened a 'major incident call', which we attended and offered resources to support the affected Boroughs. The only request for help from Thames Water was for a list of vulnerable customers.

In the days following the storms, we had between 75 and 111 teams supporting customers and working to keep our networks flowing in the affected areas. We supplemented these with an additional 16 specialist crews secured from around the UK, to help with the clean-up of our customers' properties. As the impacts of the 12 July storm stretched across the capital, this effort was spread widely and therefore thinly across the area and was not well co-ordinated with the Boroughs' responses.

On 25 July, our response was better co-ordinated with Borough responses, but we still struggled to support all our customers due to the scale of the impact.

Who was affected?

We estimate more than 1,000 properties, including homes, businesses, schools, hospitals and London Underground stations were flooded – the majority of these from the 12 July storm. Our work to establish the full facts of who and what was flooded is ongoing, and this will be validated by the Independent Review.

In the meantime, we need customers who were affected to formally report their property as flooded by completing and submitting our Sewer Flooding Questionnaire[2]. It is only by our customers reporting flooding to us in this way that we will understand the full impact of both storms so we can provide the right support, as well as determine future risk and how to manage it better.

[2] Available from www.thameswater.co.uk/help/emergencies/flooding

Lessons learnt and key actions

We have completed a thorough Internal Review, undertaking a series of internal meetings with each of our teams to establish the facts of what happened and when, and to capture and assess the lessons learnt. This allowed us to develop the forward-looking actions necessary to improve the service we provide and reduce the impact on our customers in the preparation for further extreme weather events occurring in future. We also participated in the 'storm debrief' workshops led by the London Resilience Group.

We have identified the following **six key areas for improvement**, supported by the lessons learnt and **14 actions** to address these:

1. Our response to adverse weather warnings
2. Our approach to customer service and ability to respond to contact from customers
3. Our ability to use data to gauge the impact of adverse weather
4. Our communications with stakeholders
5. Our incident response processes
6. Our onsite response.

Actions already underway

We have already implemented a number of solutions to help improve our response and how we work with others ahead of the next storm. Some of the actions are longer term solutions that will require more time to develop.

3. Background to the July storms

On 12 and 25 July 2021, two storms produced extremely heavy rainfall causing widespread surface water and sewer flooding across London.

12 July 2021

On the morning of 11 July, the Met Office issued a 'yellow' weather warning for the following day. This warning covered the entire south east region and provided a range of possible rainfall intensities with a 'most likely' forecast of 20-30mm of rain. It predicted a 'low likelihood of medium impacts'.

In fact, more than a month's worth of rain fell in under an hour and some areas received nearly 80mm of rain (170% of July's average rainfall) over the course of the storm, with Kensington, Westminster and Hammersmith the most affected. The Met Office has confirmed return periods of up to 179 years for the amount of rain that fell in one hour.

London has two sewer systems: A 'combined' sewer, which serves mainly central London, where foul wastewater and rainwater are collected in the same sewer and go to a sewage treatment works for treatment, before being released to a river; and a 'separate' system, which serves the rest of London, where the foul wastewater is collected in a sewer and goes to a sewage treatment works, and a separate surface water sewer that collects the rain and takes it to a river.

During very heavy rainfall, the mixed rain and wastewater in the combined sewers in central London can overflow into the Thames through a number of emergency outlets. However, the high tides that coincided with both of the July storms closed the flaps on these outlets that prevents the tide from entering the sewer system. This meant that the sewers could not overflow into the Thames, to their maximum capacity, and so the wastewater backed up, potentially increasing the extent of the sewer flooding. The Independent Review will investigate how significant this impact was and to what extent the Thames Tideway Tunnel, once it is operational, will alleviate this in the future.

25 July 2021

On the morning of 21 July, the Met Office issued a 'yellow' warning for the following Sunday. Again, this warning covered all of the south east region. In the days leading up to the storm, the Met Office issued further warnings about the severity of the storm, forecasting a low likelihood of extreme rainfall levels – again, around 25mm was still considered the most likely with a 'low likelihood of significant impacts'.

On the afternoon of 25 July (during the storm), the Met Office upgraded its weather warning to 'amber' due to heavy showers and thunderstorms stretching from north east Surrey to western Essex. More than a month's worth of rain fell in a few hours, with Walthamstow receiving nearly double the average July rainfall. The Met Office has confirmed a return period of 118 years for the amount of rain that fell in one hour.

4. How did we prepare for the storms?

When severe weather is forecast, including any weather warnings, our operations control centre convenes an 'adverse weather' meeting to review the forecast, supported by our own weather expert. They collectively assess the risk to our customers and the environment. They consider both what impacts may occur and the likelihood of them happening. Based on this assessment, operational teams are briefed and using their local knowledge, either prepare to take action or undertake interventions to manage the risk.

12 July 2021

Following the 'yellow' weather warning provided by the Met Office on the morning of 11 July 2021, we held an adverse weather meeting. Given the uncertainty of how much rain would fall and where it would fall, we planned on the basis of the Met Office's most likely scenario of 20-30mm. This information was passed to relevant managers to ensure they had the right information to decide what action needed to be taken.

25 July 2021

The Met Office issued a 'yellow' warning on Wednesday 21 July for the following Sunday. We held an adverse weather meeting and, based on lessons learned from 12 July, ensured that all the relevant teams were more engaged and more preparatory activities were carried out. This involved cancelling some pre-planned work to ensure more teams were available.

This forecast was also discussed with the teams responsible for managing our ongoing response to the 12 July incident and, as a contingency, we placed tankers strategically to

support the areas previously impacted. There was an additional adverse weather call on 22 July and further proactive actions were agreed. Given the most likely forecast level of rain and preparatory actions taken, we were comfortable that our incident preparation was sufficient.

As wider context, in the period January-July 2021, we had had nearly 70 'yellow' weather warnings, an average of more than two a week. Only a small percentage of these warnings resulted in flooding. If we were to plan for the worst weather scenario in each of these, we would struggle to deliver the necessary planned work to maintain and improve our systems, making us more vulnerable to bad weather.

5. Our Customer Contact Centre response

We aim to ensure that we have enough people on duty in our Customer Contact Centre to answer the phone within two minutes at any time. We forecast this demand based on historic information on the number of calls previously received on any date and time and make an adjustment for circumstances that may generate more calls, e.g., around times when customer bills are issued. As a result, the number of customer service agents on duty varies throughout the day, week and month, depending on the expected demand levels. Our contingency plans enable us to draw on additional resources if required.

12 July 2021

Over 12-13 July, we received nearly double the number of wastewater calls we would normally expect (nearly 4,000 calls received, compared to a forecast of 2,055 calls). This overwhelmed the number of people on duty in our Customer Contact Centre, leading to unacceptable waiting times and, understandably, the majority of customers hung up before we could answer their call.

On 12 July, as the storm hit, there was a clear increase in the number of calls from 16:30 onwards, and this happened to coincide with a scheduled 40% reduction in Customer Contact Centre staff after 17:00 as the day shift ended.

In response to this unexpected surge in customer demand, we updated our telephone lines at 17:00 with an interactive voice response ('IVR') message, explaining that we were very busy, that we were prioritising emergency work and encouraging customers to report non-flood issues via our website. This was updated at 20:00 to explain that the delays were due to flooding in London.

During 12-14 July, we received 6,999 online contacts via social media (compared to a forecast of 5,179) and had almost 8,000 website hits on the 'contact us' and 'flooding' pages, with circa 2,500 customers reviewing the incident message we had placed.

25 July 2021

Ahead of the 25 July storm, we made sure that suitable IVR, web and social media messages were in place before the rain started, providing customers with advice on who to contact for help. We also ensured we had our contingency team available in case they were needed.

As we normally receive fewer calls over the weekend, we planned to have less people on duty in our Customer Contact Centre. As we realised the potential impact of the storm, we offered overtime work over the weekend to provide more customer support. However, the uptake was minimal, resulting in fewer customer agents working compared to the eventual customer demand. However, our focus on training additional people meant we could call on more resource to support our customer contact teams, so the impact was reduced.

During 25-26 July, we received exceptional volumes of customer contacts again, with more than double the number of forecasts calls (2,867 calls vs a forecast of 1,391 calls) and social media contacts (4,465 vs a forecast of 1,541 contacts). We deployed all available contact centre agents including trained people from our Billing Customer Service centre.

Despite the additional resources we had put in place, we were still unable to meet the needs of our customers trying to contact us. This resulted again in a large number of customers hanging up before we could answer their calls.

6. Our communications with stakeholders

We know the importance of elected representatives being able to provide accurate and timely information to residents, businesses and other stakeholders in their communities – particularly during such extreme events. We are committed to ensuring we support this.

12 July 2021

As stated in section 4, we were unable to accurately estimate the severity of the storm. We did not therefore trigger our normal 'incident' processes, including proactively contacting councillors and MPs.

The result of this was that many elected representatives were left to contact us the following day seeking essential information. In the weeks and months since, we have met with councillors and MPs, and attended public meetings to provide reassurances, but it is clear that by failing to proactively send out communications to our political stakeholders during the storm, we contributed further to the feeling of abandonment felt by many of our customers.

On the evening of 12 July, London Resilience Group (which oversees major incidents in London) convened a 'major incident call', which we attended and offered help. The only request was from one Borough for a list of customers on our Priority Services Register. On 14 July, we contacted the emergency planning teams (which co-ordinate the local emergency response) in 10 London Boroughs (Barnet, Brent, Ealing, Hammersmith and Fulham, Harrow, Kensington and Chelsea, Kingston, Merton, Richmond, and Westminster) offering our availability to help, no further help beyond what we were already providing was requested.

25 July 2021

We applied the lessons we had learnt from the 12 July storm. Once the Met Office confirmed the 'yellow' weather warning, we proactively communicated our preparatory actions in outline to elected representatives on July 23. We sent this to the majority of the Boroughs in areas which were most impacted by the July 12 storm.

When it became clear the storm was almost as intense as a fortnight previously, we initiated our incident processes, activating the related communications plan. During the evening we contacted local authorities with offers of support and liaised with an MP in the worst impacted area. We also kept in regular contact with the London Resilience Group to ensure we were kept informed of any local issues of which we were not yet aware. On 26 July, we made follow-up contact with and offered support to impacted Boroughs as well as Barts Health NHS Trust.

We have received a large number of written complaints from customers and stakeholders which we have not responded to as quickly as we should. We have addressed this backlog by increasing the number of people working on replies and aim to have responded to all correspondence relating to the July floods by the end of the year.

7. Our operational response to the storms

12 July 2021

During 12-16 July, we had between 98 and 106 teams working on-site across nearly 2,500 jobs (this compares to a normal average of 1,738 jobs for the same period). This included supporting customers, working to keep our networks flowing by clearing blockages created by the floods and confirming all our systems were working as they should. We also brought in an additional 16 specialist crews, from across the UK to help with cleaning up our customers' properties.

The storm affected a large part of the capital, stretching from Sutton to Brent. As a result, this meant our teams were widely and thinly spread across the area and our on-site presence was not well co-ordinated with Borough efforts. This situation improved once we established a well-resourced drop-in centre on-site at the focal point in Westminster from 15-23 July, with an incident support vehicle staffed by representatives from our customer and operational teams.

25 July 2021

As soon as the storm hit on 25 July, we sent engineers to check on areas that remained a concern from the 12 July incident – including Maida Vale, Kilburn, Hammersmith and Haringey. As the incident unfolded, our engineers were sent to east London to check key strategic sites (mainly pumping stations) and ensure all assets were functioning appropriately.

During 25-27 July, we had between 75 and 111 teams working on more than 2,000 jobs and brought in 16 additional crews to help with property clean-ups. With this incident more widespread than that of 12 July, we made the decision not to create a single drop-in centre and instead our customer representatives followed up with customers after clean-ups were completed.

In total for both incidents, we cleaned up 252 properties.

8. Who was affected?

We estimate that more than 1,000 properties, including homes, businesses, schools, hospitals and Tube stations were flooded to some degree. Approximately three-quarters of these were from the 12 July storm.

Our work to ensure a full understanding of how many properties were flooded is ongoing. It is essential we have all the facts to enable us to identify and put effective flood risk management measures in place. However, capturing data covering every property impacted is always a challenge; many of those affected do not contact us directly to report the issue officially, but instead go to their own insurers or local authority.

Since the July events, we have been working hard with London Boroughs to identify as many affected properties as possible. We are grateful for the support from the Boroughs and the various residents' groups for sharing this vital information.

Earlier in the year, we developed data sharing agreements with local authorities, so all the relevant bodies are now in a better position to exchange information.

We need our customers to report any flooding of their properties using our Sewer Flooding Questionnaire. These are then added to our Sewer Flooding History Database which we then use, together with computer models of flows in our networks, to identify areas at risk and the basis for determining possible actions that can be taken to mitigate the impact of future storms.

Since the July storms, we have sent out more than 400 Sewer Flooding Questionnaires to households we know were impacted and have posted an online link to the Questionnaire more prominently on our website.

We are committed to securing all the facts as to who and what was flooded, and how. We have asked the Independent Review to help gather and validate this data for us. However, it is important we continue to raise customer awareness of the essential need to register their property as flooded through our formal Sewer Flooding Questionnaire channel so we can take due action.

9. Lessons learnt and key actions

In addition to internally reviewing the actions taken before, during and after the storms, we also undertook a series of meetings with our internal teams to capture and assess the lessons learnt, and to develop a further range of forward-looking actions that we consider are necessary for improving the service we provide our customers during extreme weather events and incidents. We also participated in a 'debrief' workshop led by London Resilience Group into the storms. Through these combined efforts, we have identified **six key areas for improvement and 14 actions**:

1. Our response to the adverse weather warnings

Key lessons learnt:

- Given the uncertainty over how much rain would fall and where it would fall, we planned for the 'most likely scenario' and placed too much reliance on local knowledge/issues versus considering the bigger picture and the wider potential impacts
- Although adverse weather conference calls were held, no-one from our Customer Contact Centre attended the calls and we therefore did not allow for the extreme weather when planning how many people should be on duty in the Contact Centre.

Key actions:

1.1. Review the adverse weather preparation process to ensure it enables an appropriate response to all weather conditions, including: Making sure everyone appropriate attends the adverse weather calls, key risks are identified at local and strategic scales and appropriate pre-emptive actions put in place.

Status: Completed. We have made attendance at all adverse weather calls mandatory for all relevant teams and ensured that the risk assessment and risk management actions consider strategic and local impacts.

1.2. Develop a hydraulic flooding 'playbook' (an operational plan of what to do when heavy rainfall that may overwhelm our sewers is forecast) with specific sections on: the triggers for convening an adverse weather call; when and how we engage with stakeholders; triggers to escalate and declare an incident dynamically; how we collaborate with partners during and after the rain; and how we support customers' recovery and longer-term support e.g., Thames Water's Trust Fund.

Status: Completed. Playbook developed and being maintained as a 'live' document, constantly under review and refined.

2. Our approach to customer service and ability to respond to contacts from customers

Key lessons learnt:

- We did not have enough flexibility or sufficient additional resources to support our Customer Contact Centre in an emergency
- Our website and social media messages were unclear and sometimes did not reflect the information being provided by our partners.

Key actions:

2.1. Increase the number of people available to provide support to the Customer Contact Centre in emergencies and improve the flexibility for Contact Centre agents to work out of core business hours, weekends and bank holidays.

Status: Underway. We have trained 25 people from other teams to be able to support the Customer Contact Centre in emergencies. We are working with the Trade Unions to review the contracts and overtime payments for Contact Centre agents. Currently our Customer Contact Centres are arranged in teams that specialise in responding to specific customer enquiries, e.g. bill queries, moving home, reporting a leak etc. We plan to fundamentally restructure our Customer Contact Centres so that almost all of customer service agents can help out during an emergency, providing much greater capacity during an incident. In parallel, we are developing a process to prioritise emergency calls, supported by IVR messages to ensure that customers are kept informed and supported during an incident. This will be completed by end of 2022.

2.2. As part of the playbook, our Public Information Office team will set out how we will communicate with customers and stakeholders during an emergency, including across our website and social media channels as priority information sources, and work to ensure there is a process for aligning our messaging with that of local authorities and other resilience partners.

Status: Completed. This is part of Action 1.2

2.3. Review how we work with water only companies in London for whom we undertake the wastewater drainage service to identify and support vulnerable customers during a wastewater-related flooding incident.

Status: Underway. This commitment will be delivered through two actions: a shorter-term action that, during an incident, the relevant water company will proactively share its Priority Services Register (list of vulnerable households) with the relevant local authorities to facilitate collaborative action; and a longer-term action that Thames Water will actively collaborate with key partners (energy industry and statutory authorities) to undertake data sharing and ultimately work towards a shared Priority Services Register hub. We are already sharing data in this way with London Fire Brigade and UK Power Networks.

2.4. Simplify how customers can report flooding by putting our Sewer Flooding Questionnaire online and making it easier to fill in and submit.

Status: Completed. The Sewer Flooding questionnaire has been simplified and placed on our website

2.5. Review how monitoring of social media can inform our strategy to support customers during an incident.

Status: Underway. Since the 12 July event we deploy our network engineers out to review potential incidents as we become aware of them via social media, or when they are reported to us. We will develop a more proactive approach to monitoring social media to identify and review potential incidents earlier.

2.6. As part of the 'playbook' define our response to flooding including how we will support customers' recovery and longer-term support e.g., hardship funds.

Status: Completed. See Action 1.2

3. Our ability to use data to better understand the impact of adverse weather

Key lesson learnt:

- We do not have the ability to combine different information sources (customer contacts, flow meters in our sewers, pumping station operation etc) into a single coherent picture of what is happening.

Key actions:

3.1. Investigate the development of a single data visualisation tool to bring data sources and information together to give clear visibility of the situation as it develops so we can better gauge the impact during an incident.

Status: Underway. We are investigating current digital solutions and will develop a delivery plan based on the findings. We will provide an update on this in May 2022.

4. Our communications with stakeholders

Key lesson learnt:

- We failed to keep key stakeholders proactively informed, leading to increased requests for information and differing messages that caused confusion.

Key actions:

4.1. Develop and train the wider emergency planning team in the good practice used on 25 July to ensure we provide better support to local authorities and London Resilience Group.

Status: Completed. Emergency planning team has been trained on the approach used in Westminster on 25 July and this approach is now part of our standard 'refresher' training.

4.2. Work with Boroughs (as the lead local flood authorities) to review multi-agency flood plans, including how their emergency planners can contact us via a stakeholder hotline

Status: Underway. We have fed into the review of 9 multi-agency flood plans this year and will continue to input as further plans are presented for review. We will remind Boroughs of the existence of the hotline through our regular schedule of meetings with them.

4.3. Review and improve the information on our website around flooding, responsibilities and where to go for help.

Status: Completed. We have updated our website pages[3] making the information clearer and easier to find, including videos on what to do and who to contact in case of a flood.

5. Our Incident Response processes

Key lesson learnt

- There was a delay in our initial incident response as we struggled to understand the cause and impact of the flooding. Consequently, we were slow to communicate effectively with our partners to agree roles and responsibilities and to ensure that our activities were aligned.

Key actions:

5.1. Adjust our risk assessment process to re-prioritise our response based on the needs of our customers rather than the performance of our systems

Status: Completed: We have tested our revised risk assessment process over recent heavy rainfall events. Also improved through action 2.5 in the short term and will be considered under 3.1 for a potential longer-term solution.

6. Our on-site response

Key lesson learnt:

- For the 12 July storm, despite having large numbers of teams supporting customers, and a number being drafted in from around the UK, we were thinly spread across a large area, with

[3] Available at www.thameswater.co.uk/help/emergencies/flooding

no visible central point of focus/contact. This reinforced the perception that we were not supporting our customers and resilience partners.

Key actions:

6.1. Review our approach to collaborating with local authorities and other emergency response partners on-site presence during large scale incidents including triggers, resources and equipment.

Status: Completed. Part of the playbook (see Action 1.2)

10. Progress report on delivering actions

We will provide an update on the progress of delivering the actions identified as 'underway' in Section 9 together with our response to the findings of the Independent Review. As these actions vary in their state of deliverability, with some requiring further investigation to define a deliverable output (e.g., action 2.3), some actions may require further work before a delivery date can be confirmed.


Thames
Water