south east water

South East Water Freeze Thaw 2022 Incident Report

February 2023

Private and Confidential

South East Water

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1. Executive Summary

This report is our response to a review by Ofwat of all water companies' performance during the freeze/thaw event in December 2022, which caused disruption to a large number of customers across the UK.

On the evening of Sunday 11 December an inclement weather event affected Sussex and Kent areas. Overnight temperatures fell as low as -7 degrees. The forecast for the week ahead was for a continued risk of freezing temperatures (day and night) for a number of days. As a precaution, an inclement weather team was assembled, met regularly, reviewed contingency plans and planned for subsequent issues.

The temperature did not go above freezing until the daytime of 17th December, where a swing of -7 degrees to +13 degrees was recorded in less than 24 hours (see figure 1). This period of cold weather was an exceptional weather event with a return period for the affected area of once in 30 years and only occurring twice in the last one hundred years.

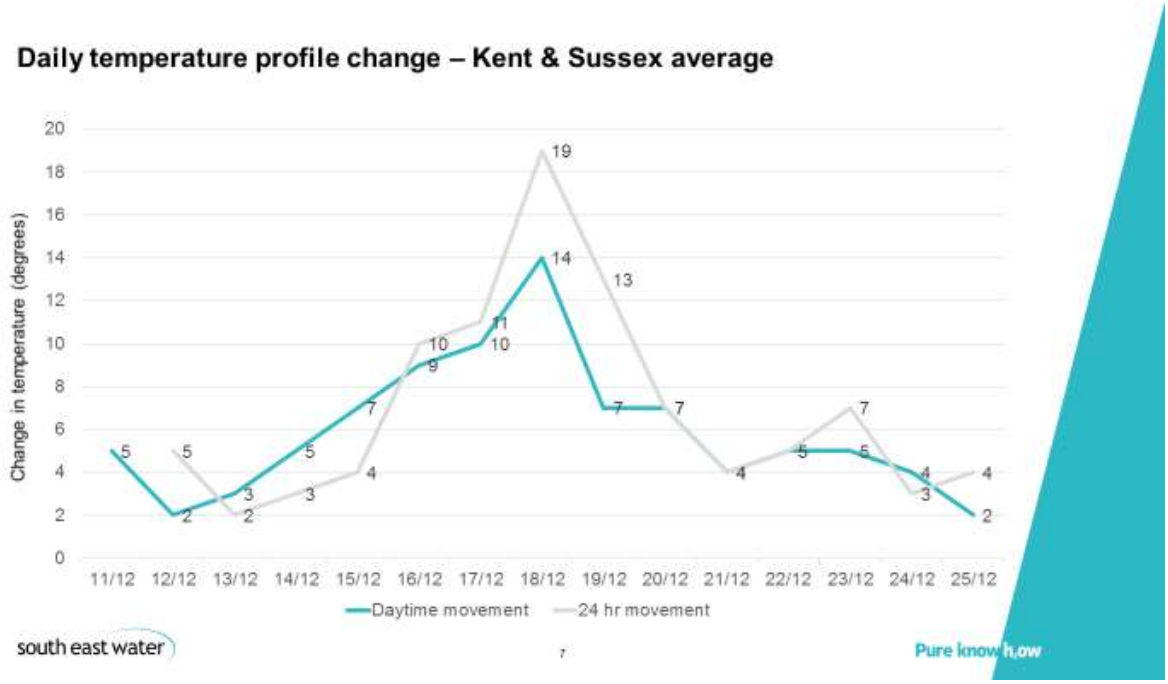

Figure 1 – Swing in temperatures across the event period

Evidence from the Met Office shows that in part of our area compared to previous events, the exposure to freezing conditions over a longer number of days (i.e. 7 –11 days) was relatively severe, especially in SEW's eastern service area. The most extreme event was observed at East Malling, whereby the 11-day accumulated freeze degree metric was the second highest in the historic record (1925-present) i.e. it has only been that severe twice in ~ 100 years. This

also does not take account of the speed of the thaw which will likely make the event frequency more extreme, this analysis is underway with the Met Office currently.

The swing in temperatures from freezing to above freezing in such a short space of time caused a thawing effect across both areas. The thaw led to ground movement which resulted in an outbreak of leaks both on our network and also customers' pipes. The speed of the event and the associated leakage drove a rapid increase in demand over a short period, going from 570 Ml/day to 620 Ml/day (see figure 2)**.** When comparing the demand on 18th December 2022 to previous years there was an increase of approx. 100Ml/day recorded.

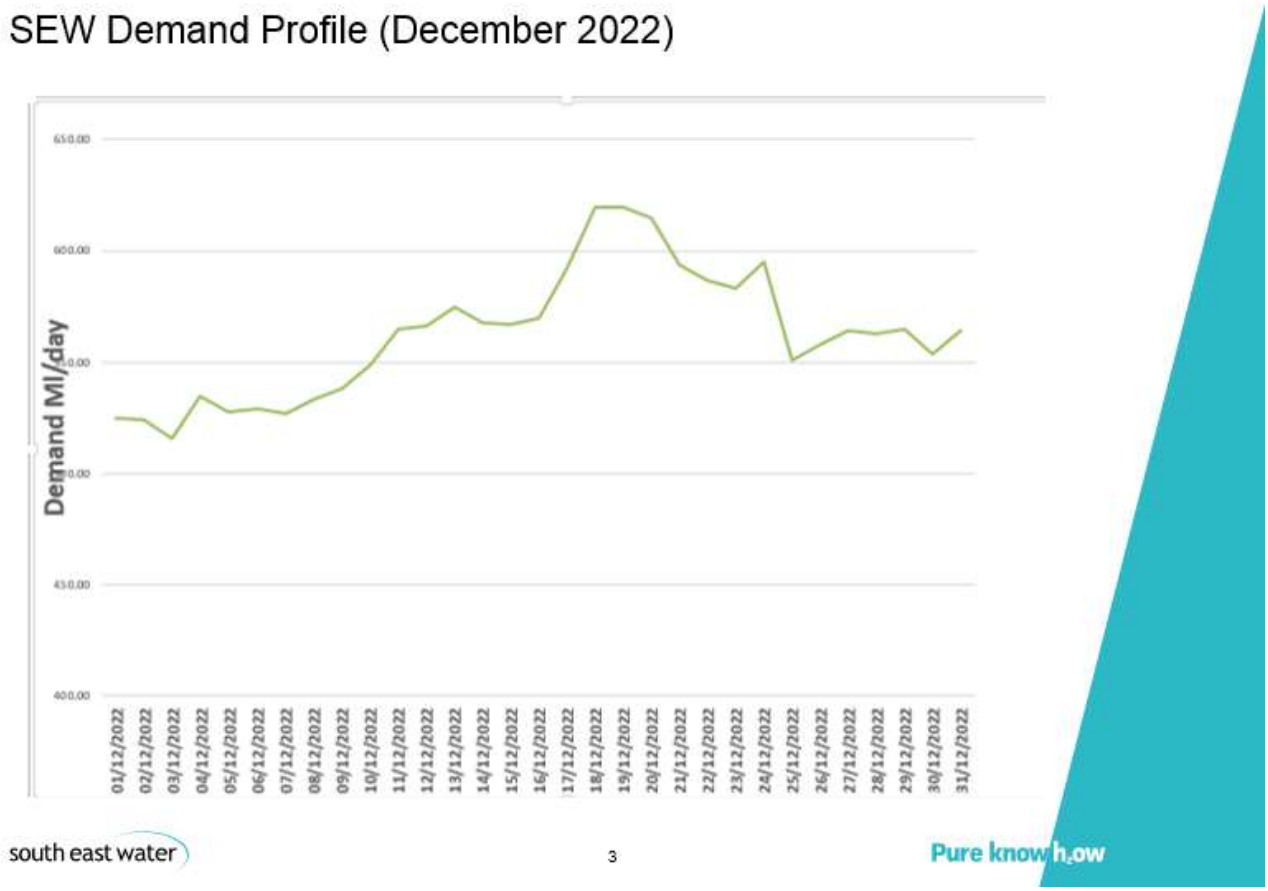

Figure 2 – SEW Demand 11/12 – 25/12

An incident response team was assembled from across the business. All 'business as usual' activity was stopped (e.g. planned maintenance that hadn't commenced) and focus applied to resolving the evolving incident. Local resilience forums were engaged before the full impact was experienced. We sought volunteers for bottled water stations and stood up incident teams from 15/12/22.

During the w/c 19 December we worked continuously to find and fix leaks. We repaired 473 leaks in total, this is over three times more leaks in one week than average for this time of year. We also repaired over 500 leaks on customer supply pipes, with customers also undoubtedly repairing leaks using local plumbing resources as well.

The extended freezing period and low temperatures caused the ground to freeze to a deeper level than usual affecting both company and customers pipes.

An initial assessment of bursts has been completed for the freeze thaw event and compared to the previous year and also the freeze thaw period in March 2018. The main headlines are:

- **Burst main repairs higher than 2021 and 2018 freeze thaw.**
  - 316 burst mains repairs, which is far greater than same period in 2021 (96 bursts), and freeze thaw 2018 (216 bursts).
- **Larger volume saved across all repairs than 2021 and 2018 freeze thaw.**
  - 2022 28Ml/day vs 2021 7Ml/day, and in line with the freeze thaw 2018 25Ml/day.
- **75% of demand increase during 2022 freeze thaw period attributed to customer side (similar level to 2018 freeze thaw).**
  - We saw 68Ml/day reduction in one week during 2022 freeze thaw. Of this 13.99Ml/day can be attributed to SEW repairs (by assigning repair type to typical volumes) and 51.5Ml/day attributed to customer side leakage/demand.

In total there were 43412 properties that were impacted with a supply interruption during the event. Full details are covered in section 2 within table 1.

Some short, medium and long term recommendations have been identified since the review that will assist SEW's overall resilience to events of this nature. These are covered in detail in section 5 of the report and are grouped into themed areas of improvement: The actions we have collated are above and beyond previous actions and reflect two factors unique to this event. One being that this event was bigger than previous and above the SEMD planning assumption, and second that the country was in an event impacting resources, bottled water and mutual aid.

We have already commenced some activities linked to the improvement actions identified. The table below lists what we have already undertaken.

#	Action	Department
1	**Alternate Water Provisions** – x2 Tankers additional have been purchased, taking total number to x3 plus curtain sider lorry and pallet trailers	Operations
2	**Bottled Water Stations** – Planning in advance for locations and layouts has already started	Operations/Asset
3	**Mock events** – Joint mock events with LRF's and local authorities have already been completed	Operations
4	**Joint industry actions** – Discussions with neighbouring companies are underway regarding potential joint bottled water stores/provisions to improve resilience	Operations

5	**Short term Asset Improvements** – a set of 0-6 month and 6-24 month schemes specifically focussed on resilience /pinch points are being progressed	Asset/Operations
6	**Stakeholder feedback sessions** – We have conducted following briefing sessions with all key MPs impacted by the event, to discuss the impact on their communities, our detailed response and how we have compensated their constituents.	Retail/Operations
7	**Communications** - We have accelerated our project to review and determine our future technology requirements for communication with customers.	Retail/Communications

A review of status for the actions arising from the 2018 Freeze Thaw event are covered in detail in section 5.5. In summary the majority of these actions have been completed. Of the ones highlighted as “ongoing” we do not believe they would have reduced the impact of the recent event.

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2. Incident Impact and Causes

Details of the impact of the freeze thaw within the South East Water area, including underlying causes of any impacts; numbers of properties and customers experiencing problems; length of time to resolve outages.

2.1 Sussex Area

The underlying cause in the Sussex area was the increase in demand linked to increased bursts due to the freeze thaw event. Other contributing factors such as planned maintenance at Barcombe on 7th December and unplanned outage on 17th December led to reduced levels at our strategic service reservoirs at the start of the freeze thaw event. This combination of events meant the impact experienced by our customers was greater during the freeze thaw period.

Barcombe WTW is a key supply site in Sussex. The planned maintenance at Barcombe on 7th December was in response to a DWI legal instrument compliance notice. Planning to commence this work had started prior to the 7th. The work was planned for a maximum of 1 day and all indicators to allow work to commence were acceptable (e.g. service reservoir levels). At this point there was no knowledge of a potential freeze thaw event.

The extreme overnight temperatures (-8 degrees) on Friday 16 December caused equipment at the WTW to fail. A frozen level sensor led to problems with raw water transfer, we have not encountered this issue in any previous event. This shut the site down, and also presented further problems with chemical dosing lines freezing (due to no flow). This is despite trace heating being in place and operating at the site. The total outage lasted for 10 hours Barcombe WTW was restarted on Saturday 17 December at maximum output. However it took time to refill the extensive pipeline and drinking water storage network.

There were also two trunk main bursts in the West Hoathly and Selsfield areas, losing 0.5Ml/d litres of water per day. This combined effect resulted in drinking water storage tanks draining and customers experiencing low pressure or no water.

During the incident the field operational teams and the incident management teams worked collaboratively to formulate a return to service plan. The plan was tailored to suit the event, using previous plans and experience. Part of the plan was to continue to resource Barcombe WTW 24/7 for the remainder of the incident. This was to mitigate/minimise any potential future outage and keep the works at full flow, key to the refill plan. Also where rezoning was possible this was utilised. The aim was to maintain supplies to as many customers as possible and return all customers to supply as early as possible. The plan was enacted and successfully achieved its aim. Due to the way the Sussex system is designed (refills in series) this did mean a number of clustered areas were affected at different times during the incident.

Please see table 1 for full details of all properties that experienced problems during the event.

2.2 Tunbridge Wells Area

The underlying cause in the Tunbridge Wells area was the increase in demand linked to increased bursts due to the freeze thaw event. Other contributing factors such as planned and unplanned outage led to reduced levels in some strategic service reservoirs. This combination of events meant the impact experienced by our customers was greater during the freeze thaw period.

Following a reduction in output flow from Saints Hill WTW due to planned borehole maintenance (5th – 16th December), and a shutdown at Groombridge WTW (10th December), caused by a frozen pH monitor, levels in Langton Service Reservoir, Bloodshot SR and Blackhurst SR dropped prior to the weekend of the 17/18th December. Also there were ongoing issues at Tonbridge WTW which had been out of service since 17th November due to flooding.

The Blackhurst Lane service reservoirs require a minimum capacity of 20% to ensure the booster pumps, which pump water to properties on higher ground, can operate. When the thaw started demand in the area increased significantly. This was due to various leaks on both customer supplies and our network. This led to Blackhurst Lane service reservoirs being drained to 20% on a number of occasions, which in turn shut down the booster pumps and impacted supply to customers. We did restore supplies intermittently to the impacted customers for a number of hours a day over this period.

In an attempt to assist the levels in Blackhurst Lane service reservoir a 24 hour tankering service was established, but due to the large demand on the network (customer and company leakage related) this wasn't able to keep up and levels continued to flux above and below the necessary pumped supply level during this period.

As the incident continued we were able to return Tonbridge WTW's to service following the necessary remedials and water quality procedures post the flood, as well as maximising output from other WTWs, and redirecting water around our network to minimise impact across the region.
Leaks were repaired across the town, including a significant leak in the Pantiles area. We also saw significant increases in leaks on customer properties. As an example, a substantial leak was found at a disused meat processing plant, which measured 6 litres per second loss. This is the equivalent of losing over 500,000 litres of water per day.

Please see table 1 for full details of all properties that experienced problems during the event.

2.3 Rural Kent Area

Some customers in the Cranbrook, Staplehurst, Biddenden and Benenden areas experienced low pressure or no water directly after the freeze thaw event. During the incident, leaks (both company and customer side) in the local network meant that the pressure wasn't high enough to supply all customers at higher elevations, who experienced low pressure or no water.

In Staplehurst we identified three separate water main bursts which were repaired but this made it difficult to confirm when local supplies would be restored. Air trapped in the system also delayed customer supplies coming back on once these repairs had been completed. A small number of customers close to our Cranbrook reservoir were also impacted during this period.

Whilst we had many challenges across the region the vast majority of customer's supplies were not impacted. We took the decision to turn off boosted supplies around Challock & Molash overnight to make sure we could maintain supplies during the peak periods during the day.

Please see table 1 for full details of all properties that experienced problems during the event. The length of time is an average for the area. Within each area there is a range of times for DMA's within that area.

Area	No. of properties	Average Outage (hrs)
Balcombe	1914	109
Barcombe	3700	47
Beacon	6718	67.9
Best Beech	731	30
Bewl	3553	12.3
Blackhurst	7762	111.2
Bloodshots	319	7.25
Charing	1	12.75
Cottage Hill	3310	37
Cuckfield	2723	22.9
Forstal	77	6
Groombridge	4001	15.6
Grovelands	4863	63.5
Weald	2379	78.3
Wych Cross	261	41.4
Total	**42312**	

Table 1 – No. of properties experiencing problems

2.4 System Resilience

SEW categorises system resilience into 3 areas:

- **Supply resilience**

  Essentially the same as ‘headroom’. A resilient company has more water resources than it needs to cover most droughts. This resilience is delivered through the WRMP process.

- **Network resilience**

  A resilient network can deliver water to customers in more ways than one. If a main (or other asset) fails, the company will be able to deliver water to customers via another route.

  Generally ‘grid’ or ‘ring’ network designs are more resilient than ‘linear designs’. Network resilience can be enhanced with interconnecting mains and/or extra reservoir capacity. This resilience is delivered through the WRMP and Price Review processes.

- **Capacity resilience**

  Understanding of this resilience is still emerging in the industry. Capacity resilience is the ability to collectively produce and distribute enough water to cover demand. i.e. have sufficient storage to allow recovery time and enough capacity to produce enough water to cover demand at a local level.

Figure 2.0 overleaf outlines key differences within SEW from area to area.

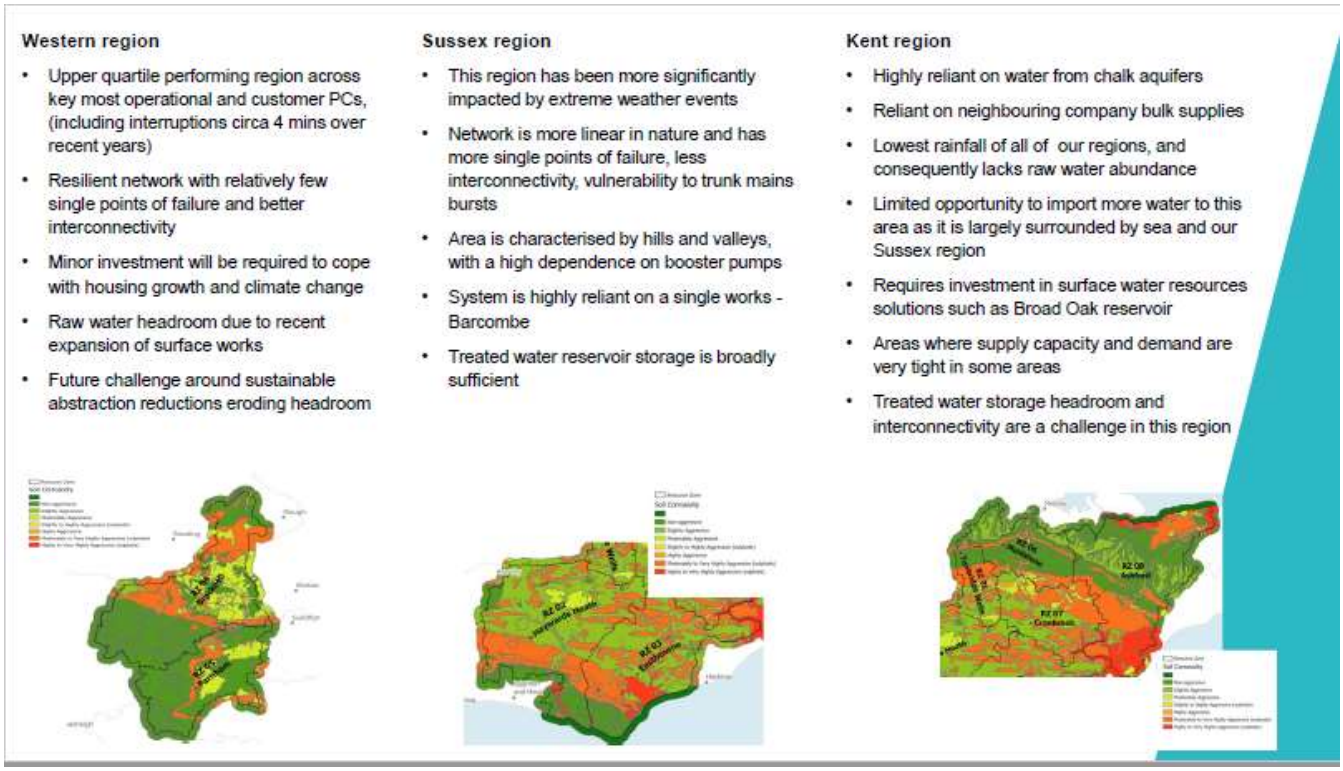

Figure 2.0 – Differing resilience issues for West, Sussex and Kent.

Over the previous years we have experienced extreme weather which has led directly to customer supply interruptions.

- Beast from the East (2018) – Demand exceeded supply in some areas due to high leakage (company and customer side) from a freeze thaw event.
- Summer 2020 – Demand exceeded supply in some areas. This was very similar impact to 2018 freeze thaw, but the underlying demand increase was due to hot weather, and demand patterns changing due to Covid lockdowns.
- Storm Eunice 2022 – Supply interruptions reduced output (WTW outages) due to power outages.
- Summer Drought 2022 – Demand exceeded supply in some areas. Demand increase was due to the hot weather, but there were also supply interruptions due to power outages linked to the hot weather.

It's to be noted in 2022 SEW experienced drought, flooding and freeze thaw in a 45 day period. This is evidence of increasing levels of changing weather patterns adding increased pressure onto our system resilience.

During this freeze thaw event demand exceeded supply in some areas. Again this is mainly linked with a spike in demand due to increased leakage (customer and SEW network), but is also linked to supply and network resilience.

One contributing factor relates to the levels in some reservoirs when entering the freeze period as a result of the following at the feeding treatment works.

- Sussex Area - Barcombe WTW planned outage on 7th December for 15.5hrs to rectify a leak on contact tank (DWI legal instrument compliance).
- Tunbridge Wells Area - Saints Hill WTW planned supply reduction from 5th – 16th December for planned maintenance activities (borehole cleaning).
- Tunbridge Wells Area - Tonbridge WTW unplanned outage due to flooding 17th November – 20th December.

These three outages were contributing factors for lower levels at the strategic service reservoirs, which meant the impact for freeze thaw was worse than it would have been without these outages.

Two of three outages were for planned maintenance. There is a need for increased supply resilience in these areas to enable planned maintenance activities and to buffer unplanned events. This will enable increased headroom to catch up service reservoir levels efficiently and effectively post these outages.

It was also noted that leakage is a contributing factor to supply resilience. During the freeze thaw event we have estimated 75% of leakage was on the customer side, reductions in this can greatly assist supply resilience. Also SEW network leakage was higher than usual going into the period following the exceptionally dry period in the summer**.** The burst rate was lower going into the summer but rose steadily post the summer drought period for a number of months.

As the freeze thaw event progressed it became increasingly apparent that lack of cross connectivity between supply areas (particularly in Sussex and Kent), and within supply areas was hindering the ability to balance water supplies to all areas. Improvements to this will enable a better response during an event and reduce supply impacts to customers.

Nb. West area had no impact on customers during the freeze thaw, even though bursts and demand increased within this area. This area has more headroom and better connectivity to deal with events of this nature. This is also consistent with previous events (e.g. summer 2022).

The lessons learnt from this event and from previous events have been included in section 5.2 of the report.

3. Impact Response

A full and candid explanation of South East Waters response to any impacts, including communication with customers; mutual aid with other companies; distributions of bottled water; and identification of vulnerable customers and the support provided for them.

3.1 Communications with customers

We utilise a matrix style approach for communication with our customers and stakeholders. This aligns with our incident management processes (see below). During the Freeze Thaw incident we adopted all channels with the exception of the daily customer email. This was assessed but due to the variability of impact during the incident it was decided that website updates would be more effective, so updates could be given when more details were available. We contacted customers towards the end of the incident as water supplies were returning and then directly after the event to provide a full explanation of what had happened"

Channel	Level 0	Level 1	Level 2	Level 3	Level 4
IYA Map	Regular updates through the incident – triggered by localised incident responses				
IYA Emails	Regular updates through the incident – triggered by localised incident responses				
IYA SMS	Regular updates through the incident – triggered by localised incident responses				
Stakeholder liaison	Defined by the incident				
Reactive media	Defined by the incident				
Press release				Daily	
Website landing page				Updated 6am, 12pm & 6pm	
Website incident timeline				Updated 6am, 12pm & 6pm	
Social Media posts				Updated 6am, 12pm & 6pm	
Stakeholder email				Daily	
Customer email					Daily
Council Communications Pack					TBD
Bottled water station map					Updated 6am, 12pm & 6pm
Customer Letter					On incident closure

IYA – In your Area system

The level of communication we undertook during the incident was unprecedented, due to the wide spread geographical impact and duration. Throughout the incident we used a number of channels to update our customers and stakeholders, including website, social media, email, text message, meetings, phone calls and our Customer Contact Centre.

In addition, and reflective of the period of time that the incident had occurred for, we proactively contacted TV media outlets and secured CEO interviews on BBC SE Today & ITV Meridian.

One notable difference for this event was the volume of stakeholder and press interest far exceeded any previous event. This was mainly due to MP interest and the proximity to Christmas as a focus for the press.

3.1.1 General Communications

- Social media: 85 posts were sent out across Twitter, Facebook, Instagram and LinkedIn with 9685 contacts with a response time of 3.5hrs (normally 300-400 contacts a week).
- Website banner was updated 52 times with over 450k page views of specific customer information.
- 50 statements were issued to the press and 13 interviews took place on TV & radio.
- Sent out 10 different customer emails – and over 200K digital communications to customers by email and text message.

3.1.2 Customer Call Centre Communications

- During 6 days we received 16,157 phone calls from customers across all contact areas. Despite the high level of call volume (record volume), 85% of all calls were handled.
- Increase in call volume of 102% week on week for water supply issues. In total we received 8,831 calls from customers regarding water supply.
- The Customer Contact Centre was opened from 6am to midnight during the incident, with agents available on Christmas Day from 6am. On a normal day, this is open from 8am to 7pm.

3.1.3 Stakeholder communications

- Our CEO had daily calls with Greg Clark, MP for Tunbridge Wells, and other calls with Mims Davies, MP for Mid Sussex and Nus Ghani, MP for Wealden.
- The communications team were speaking daily to the offices of Greg Clark MP, Mims Davies MP, Jeremy Quin MP, Helen Grant MP, and facilitated calls between those offices and the Ops Director where required.
- During the incident the communications team provided:
    - 35 calls to stakeholders (councillors/MP offices/MPs)
    - Issued 46 emails to stakeholders
- Our regulatory colleagues at Ofwat, CCW, Defra, EA, Natural England & DWI all received daily updates on the operational situation and additional telephone briefings where required, up to & including Christmas Eve.

When the incident was over we wrote to all customers impacted offering our apologies and providing compensation payments.

3.1.4 Improvement areas

Whilst every effort was being made to ensure our customers and stakeholders were kept up to date there were some communications issues experienced during the incident.

- **Difficulty having an accurate message for customers in the early stages of the incident**.

  This was due to the scale of the incident being managed and a fluctuating operational situation (e.g. 75% of demand increase on customer side). There was no definitive message to give an answer to the customer's main question of "when will my water be back on?"

- **A failure of the "In Your Area" system.**

  In Your Area is SEW system to manage direct communication with registered customers via the use of SMS messages. The sheer volume of traffic made the In Your Areas system inoperable for a time period, leading to no alerts being sent to customers registered for updates. When the system recovered and 'caught up', it resulted in incorrect information being sent to customers that were confusing and not accurate as they were then out of date. This lead to an increase in customer frustration and customer contacts.

- **Volume of media interest.**

  This led to an increased amount of resources dealing with communications for the media. This has never been experienced before to this scale and was difficult to manage on a day to day basis.

- **Bottled water stations**

  Due to the scale of the incident is was difficult to have a clear message for our bottled water station volunteers and ultimately our customers (e.g. when will the next delivery be?)

Learning can be taken from this event for all of the areas listed above. This will form part of the ongoing "lessons learnt" review. This is covered in more detail in section 5.2.

3.2 Mutual Aid

As the weather event was nationwide a similar picture emerged nationally. At least six other water companies were also being affected, which put strain on supply chains for alternate water and resources to find and fix leaks. This also reduced capacity to seek mutual aid from neighbouring water companies.

We appealed to other water companies for mutual aid (bottled water, drivers, tankers and lorries), however due to the nationwide nature of the incident we could only source 90 pallets of water from Thames Water.

3.3 Alternative Supplies

As part of our emergency planning process we have a plan in place for alternative water supplies. This plan has is on the basis of an impact to 35000 customers (15000 properties), which is aligned to the SEMD requirements of 1.5% coverage.

The number of customers impacted changed during the incident. The overall view is shown in the table below.

Plan			December 2022 Freeze Thaw	
Priority	Customers	Description	SEW supplied	Commentary
P1	1 Hospital	1 water tanker used to support tier 1 site	3 tankers	3 hospitals required support during 2022 freeze thaw. This is 2 more than planned.
P2	1000 vulnerable	Direct deliveries to affected customers totalling 500 deliveries per day	1520 PSR customers. On average 1159 deliveries per day.	More than ever previously delivered. 6956 deliveries of bottled water
P3	10 Care Homes, 1000 Residents	1 water tanker used to support tier 2 in combination of Aquastack tanks	47 care homes supported	Approx. 47000 litres of water supplied.
P4	33000 Domestic	4 bottle water collections hubs each serving 8250 customers. On day 3 bottled water to be supplemented by static tanks and grab bags.	671088 litres 36000 litres	Had 9 bottled water stations, 5 more than planned. Tankers supporting more hospitals led to static tanks being deployed from day 4.
P5	10 bowsers	Best endeavours support	Bowers set up in two locations in Kent and Sussex	Supported 64 farms (approx. 64000 litres)

The scale of the incident experienced was unprecedented and the response to alternative supplies was also. Bottled water stations were set up in nine locations during the incident. The tables below list the SEW resourced stations (SEW volunteers) and the non-resourced stations.

SEW resourced stations

Station Opened	Station Closed	Address	Open	Closed
17/12/22	27/12/22	Tesco Woodgate Corner Pembury TN2 4NE	09:00	21:00
19/12/22	24/12/22	East Grinstead Rugby Football Club - The Gearon Pavilion, Saint Hill Rd, East Grinstead RH19 4JU	09:00	21:00
19/12/22	24/12/22	Haywards Heath Rugby Football Club - Whitemans Green, Cuckfield, Haywards Heath RH17 5HX	09:00	21:00
19/12/22	27/12/22	Beacon Academy - Beeches Rd, Crowborough TN6 2AS	09:00	21:00
20/12/22	27/12/22	Pease Pottage Community Hall, 4 The Hemsleys, Pease Pottage, Crawley RH11 9BX	09:00	21:00

Non-resourced stations

Station Opened	Station Closed	Address
19/12/22	27/12/22	MBC, Bell lane car park – Bell lane - High St, Staplehurst, Tonbridge TN12 0AR
19/12/22	27/12/22	The Cowdray Arms London Rd, Balcombe, Haywards Heath RH17 6QD
19/12/22	27/12/22	Challock Village Hall - Blind Ln, Challock TN25 4AU –
22/12/22	26/12/22	Salvation Army Hall, Bayhall Road, Tunbridge Wells, TN2

All stations were located as close as possible to the areas that had been impacted by loss of supply. Three of these stations were open on Christmas Day as a precaution. 110 volunteers from around the company attended the manned stations over a 10 day period.

We also supported hospitals and other medical facilities in the areas affected with dedicated tanker deliveries and deployed two dedicated livestock hubs in Kent and Sussex, where farmers could hook up bowsers or tanks to collect water. As well as this we also supported our vulnerable customers with direct deliveries of bottled water.

In total we estimate we deployed over 700000 litres of bottled water during the incident, which is far greater than any previous incident the organisation has ever experienced.

3.3.1 Improvement areas

Even with this there were issues identified during and after the incident regarding alternative water supplies.

- **Strain on available resources due to scale of the event.**

  The event was much bigger in scale than the requirements of the SEMD plan. All resources whether it be people, bottled water, and logistics were stretched throughout the incident.

- **Alternate water supplier (Water Direct) also supporting six other water companies with critical issues.**

  Supply chain issues meant that a round trip to restock a lorry – carrying 22 pallets of water - could take up to six hours. At peak points, that water would be distributed in a period of two hours.
  HGV drivers were in short supply, and exacerbated by increased supply chain activity in Christmas week, making driver availability a further challenge. When driver hours were completed, drivers were unable to complete their journeys.

- **Locations and numbers of bottled water stations.**

  Due to the scale of the event more bottled water stations were required than had previously been planned for within the requirements of SEMD. Although more bottled water stations were deployed during the event, it was felt this process would have been easier if more locations had been pre planned either resourced by SEW or the LRFs.

- **Communication of locations of bottled water stations.**

  The event was fluid and changing by the hour. Bottled water stations had to be deployed quickly to ensure supply of water to affected customers. There were occasions our communication lines lagged behind events happening in the field (e.g. websites not up to date with latest information on bottled water stations).

- **Communications to bottled water stations.**

  Due to the issues with supply and deliveries from Water Direct it was hard to know exact times of when bottled water would be restocked. This made it difficult for volunteers at the bottled water stations to communicate effectively with customers and on a limited number of occasions customer found the stations had run out of bottled water.

Learning can be taken from this event for all of the areas listed above. This will form part of the ongoing “lessons learnt” review. This is covered in more detail in section 5.4.

3.4 Vulnerable Customers

Our emergency plan for vulnerable customers is to deliver bottled water direct to their properties for anyone registered on our Priority Services Register (PSR). As the event progressed we worked collaboratively with the Local Resilience Forums. Separate LRF/SEW sub groups were created for vulnerable customers. This assisted all sides to focus on what was required for our vulnerable customers and also led to identifying further vulnerable customers to add to the PSR who needed our assistance.

Via the LRF’s we partnered with external agencies to assist with direct deliveries to our vulnerable customers living in areas where access was made difficult due to the adverse weather. During this event we made 6,956 deliveries (see table below) to those customers on the PSR, and to customers we added to the PSR during the event.

	Priority Service Register			Reactive
Delivered by	**SEW**	**Water Direct**	**East Sussex 4x4**	
19/12/2022	108	942	0	148
20/12/2022	74	1218	171	599
21/12/2022	117	784	672	251
22/12/2022	0	657	447	249
23/12/2022	0	164	0	248
24/12/2022	95	0	0	12
Total	**394**	**3765**	**1290**	**1507**

We communicated with our vulnerable customers via SMS message, where we sent out 9823 messages during the event period. Based on the customers' ability to collect bottled water we categorised the information and tailored our direct messages to provide a relevant update on how they could receive bottled water.

3.4.1 Improvement areas

Post the event we have reviewed how we can further improve our service for all vulnerable customers for any future events. These are shown below.

- **Strain on available resources due to scale of the event.**

We found it difficult to maintain resources to keep a direct delivery service of bottled water flowing effectively. This was due to the scale of the event being much wider than we had experienced before.

- **Access to appropriate vehicles to maintain deliveries**.

Due to the adverse weather 4x4 vehicles were required to access some of our vulnerable customer's properties. Again due to the scale of the event we needed additional vehicles to support our bottled water deliveries. We did mitigate this to by partnering with Sussex 4x4.

- **Improving our Priority Services Register**

During the event we worked closely with the LRF's and have learned of new ways of improving our combined PSR information and service. This is something we will continue to work on and grow our resilience partnerships.

Learning can be taken from this event for all of the areas listed above. This will form part of the ongoing "lessons learnt" review. This is covered in more detail in section 5.4.

4. Compensation Arrangements

The event in December 2022 is classified as a GSS exemption due to extreme weather, (see figure 1 – swing in temperature, and length of freeze). Although this is the case we felt it appropriate to compensate customers and their communities.

Our approach to the compensation payments is:

- Goodwill payments beyond the minimum to the worst affected areas totalling in excess of £4.3m, this compares to the 2018 FT compensation of £1.29m, recognising the duration and the impact on the festive period of the 2022 event.
- Direct customer payment to all areas impacted for 3+ days.
- Community payments to remaining key areas, those impacted 1.5 days or less, where supplies were intermittent.

5. Lessons Learnt

Lessons learnt from this experience and changes you intend to implement; and whether lessons learned from the 2018 freeze-thaw and recommendations from Ofwat's Out In The Cold review have been implemented.

There are 4 main areas of focus that have been identified during and post this event.

- **Operational** – Includes sub areas of focus for operational teams in preparation for an event and within an event.
- **System Resilience** – Includes sub areas of focus to improve system resilience to assist in prevention of customers impacted during an event.
- **Customer Communications** – Includes sub areas of focus to improve communications with customers during an event.
- **Alternative Supplies** – Includes sub areas of focus to improve planning and management of alternative supplies before and during an event.

Each recommendation identified has been given a duration (term) to be completed.

- Short – Completion within 6 months of freeze thaw event.
- Medium – Completion after 6 months but with current AMP period.
- Long – Completion within next AMP period (part of PR 24).

5.1 Operational

Issue Identified	Recommendation	Term S/M/L
Return to service plans	Complete return to service plans at a system wide level as per the approach undertaken during the event in Sussex.	S

5.2 System Resilience

Issue	Recommendation	Term S/M/L
Customer side leakage	Review communication and engagement plans for the "wrap up for winter" campaign and increasing penetration of this approach. Overall aim of the review is ensure coverage is maximized, and take up improves.	S
Network visibility constraints (flow and pressure),	PR24 submission and DEFRA early start schemes to include installation of a smart network. This will increase flow and pressure visibility across our network and will improve leak detection capability to within 50m of a leak.	S
Unplanned outage at strategic treatment works	Investigate outages further to understand root causes (e.g. maintenance, design, single points of failure). Learnings from investigations to be included in an unplanned outage improvement plan. Engage with water suppliers in countries with significant more winter challenges to gain learnings and implement.	S
Network cross connectivity constrained in certain areas, leading to a supply demand imbalance.	Investigate options for improved network cross connectivity that would increase operational flexibility and alleviate supply/demand problems. Ensure options are considered in PR24 submission and DEFRA early start schemes.	M
Flooding at certain Treatment Works led to reduced supply.	Investigate options of flood defenses/river management at affected sites. Ensure options are considered in PR24 submission and DEFRA early start schemes. Ensure protocols are agreed with EA to reduce flood risk in particular to Tonbridge.	M
Sussex area – supply reliance on Barcombe WTW	Investigate options to reduce reliance on Barcombe WTW. Ensure options are included in PR 24 submission and DEFRA early start schemes.	M

5.3 Customer Communications

Issue	Recommendation	Term S/M/L
In Your Area system not fit for purpose for scale of incident experienced.	Review communications systems to achieve overall aim of reliable and consistent messaging to all customers during an event. The review must include: • Engagement with other utility providers (e.g. power, water, telecoms) to compare and contrast against SEW systems/processes. • Optioneering of system updates or replacement. • A review of management systems in place (RACI, procedures, etc) and update if required. • A review of resources to manage and administer system/s (BAU vs incident). • Update of customer communications strategy/plan as changes are implemented (including communications and training if required).	S
Customer/stakeholder messaging across the incident was inconsistent	Review process/procedure for decision making and deployment of customer/stakeholder communications. Consider the creation of a larger communication cell for this size of incident, operating after technical incident team has provided them with updates. Review resources required to deliver revised communication plan/process at different event levels (must be trained and competent, not necessarily from the communications teams).	S

5.4 Alternative Supplies

Issue	Recommendation	Term S/M/L

Alternative Supplies is currently managed within the central operations function.
 	
This is split between two exiting BAU roles (additional duties on top of BAU). No one role responsible for Alternative Supplies.
	To improve focus on Alternative Supplies it is recommended a new role of Alternative Supplies manager be created. The role will be responsible for:
	• Creating, owning and deploying the Alternative Supplies strategy/plan
	  ○ The strategy/plan needs to include considerations for all alternative supply methods (e.g. Bottled water, ASV's, Bowsers).
	  ○ Resources required to deliver the strategy/plan.
	• Own all Alternative Supplies recommendations and associated onward actions from this review.
		S

Bottled Water – General management of stations.	Review process/procedure for management of bottled water stations. Create dedicated trained volunteers and associated processes i.e. formalising the volunteer role.	S

Bottled Water – Too much reliance on Water Direct given it was a National event	Review bottled water inventory/distribution strategy. Review output must include:
	• Recommendations on bottled water storage
	  ○ Internal vs external provider
	  ○ Amount of bottled water to be stored (to cover worst case scenario from incident planning).
	• Other potential solutions to Water Direct.
	  ○ Partnering with bordering water companies.
	  ○ Partnering with LRF's (councils etc).
	  ○ Partnering with volunteer organisations.
		M

Bottled Water – Pre Planning for bottled water stations.	Review number and locations of pre agreed bottled water stations. Number of stations needs to be appropriate to level of incident and impact on customers. This	M

It was noted from consistent feedback that not all bottled water stations were pre agreed, with an appropriate set up and management plan in place.	information needs to be included in the Alternative Supplies strategy/plan. Output of review must include: • Engagement with LRF's/local councils on potential sites. • Set up plans in place for any new site agreed. • Logistics plans in place for any new site agreed. • Resources required to enable service to be maintained during an incident.	
Use of tankering as an alternative supply not widely used. 2 tankers are currently available with potential of a 3rd from Water Direct.	Review the potential of increasing the utilisation Alternative Supply Vehicles (ASV's) to maintain customer supplies during an event. If possible this will reduce reliance on bottled water.	M
Vulnerable Customers – Improve Priority Services Register service	Review current operating model for PSR customers with regards to bottled water distribution. The aim is for the operating model to meet PSR customer requirements and to be deliverable and sustainable at different event levels. The review output must include: • Review of PSR information, ensuring all customers are correctly identified as requiring priority services. This could include addition or removal. • Engagement with LRF's and local councils on options available to meet the aim. • Review of required resources to achieve the aim (at varying event levels). • Review of required vehicles/equipment to achieve the aim (at varying event levels). • Review of logistics management during an event to ensure deliveries are managed appropriately and all customers receive required deliveries. • Update of emergency plans to include any changes on the back of the review.	M

5.5 2018 Freeze Thaw Update

Recommendations and associated actions were identified from the last freeze thaw event in 2018. Please see below table containing information on each action and status of implementation.

Action	Status	Comments
Assess and test current asset lagging and trace heating	Complete	Completed with Operations managers signing off review complete
Identify and deliver additional investment required for sites with missing or incomplete lagging and trace heating	Complete	Missing lagging and trace heating repaired and replaced.
Implement a 'major event' simulation exercise for testing the emergency plan	Complete	Completed 27/11 with Defra attendance - Crowborough Cottage Hill Best Beech - Groombridge to Hourne Farm main and Hourne Farm Pumps - Additional pumps at Groombridge - Hourne Farm to Cottage Hill Main - Bewl to Cottage Hill - Cuckfield to Butlers Green - Potential SW connection near Pilstyle (TBC) - Lenham area resilience (although rate of loss might drain anyway). - Wellwood to Potters Corner main
Develop and agree a memorandum of understanding with resilience forums, to clarify roles and responsibilities during an emergency	Complete	Disruption of Water Supply plan now in place with reach of the resilience forums (5no.), also LRF and Emergency Responders plan. Evidence of these plans held on the Resilient Direct website for access by the LRFs.
Develop an appropriate communication plan with the National Farmers Union (NFU) to encourage farmers to become more resilient both to avoid bursts (wrap up for winter) and to cope with supply interruptions	Complete	Communications plan drafted and agreed with NFU.

As an additional element of our catchment management programme, offer resilience reviews with farmers and livestock owners and help them develop business continuity plans	Complete	Process now in place and included in catchment review process with farmers
Define a clear policy that supports the repair of customer side leaks, especially during emergency events	Complete	Policy agreed and document being drafted
Undertake appropriate critical infrastructure reviews with businesses to generate business continuity plans i.e. for large schools	On track - Ongoing	To be progressed.
Develop specific resilient customer initiatives as part of our business plan for specific types of customers and incidents	Complete	This Strategy sets our approach to supporting our customers but also provides the initiatives that we have for customers which are available not only now but to which we have committed to developing in the short to long term. This is also covered by our Resilience Maturity Assessment annual audit
Publish asset investigation reports for the three impacted areas, including proposed investment to mitigate/ resolve underlying issues	Complete	Published and on website
Develop an operational risk management tool, with links between likely demand, available supply and storage to identify remaining headroom.	Complete	Tool delivered. Being used where appropriate.
Include incident response tests into our SMART network trial and to include findings into forward rollout from 2020 - the rollout of SMART networks during 2020 to 2025 is included within our 2020 to 2025 business plan	Complete	Smart water networks being included in PR24 and Defra schemes.
Improve resilience at strategic infrastructure sites either with strategic storage or through provision of larger strategic tanks, and supply tankers	Complete	Combination of additional tanker provision alongside ability to create temporary additional storage using multiple Arlington tanks in combination. Live testing undertaken as part of hospital reviews.
Improve approach to vulnerable customer alternate water deliveries, through support of resilience forums and local community groups, increased local stock of 100 pallets of bottled water; and new logistical vehicle for moving bottled water.	Complete	Bottled water work complete, logistical, local stock in place, vehicles hired and engaged with resilience forums and parish councils

Improve resilience of bottled water stations through more comprehensive training of alternative water standby roles, standard bottled water stations design, and standard set up of a station.	Complete	Confirmed this work has been completed.
We improve the service levels and traceability of delivers from Water Direct, supplementing this service with our own bottled water stock and considering a permanent alternative water manager role.	Complete	Bottled water work complete. Finalising responsibilities with Water Direct
Develop the ability to supply livestock owners through the deployment of static tanks and allow farmers to collect and use bowsers, or fill them directly.	Complete	Hiring of additional bowsers occurring, and investigating the provision of static tanks to farmers
Purchase enough suitable bowsers to handle an equivalent incident and install bowser filling points at all critical stores	Complete	Now in place
Replace current static tanks with lighter and more easily deployable static tanks	Complete	30 additional Arlington tanks purchased (total stock of 120)
Extend our current process for the capture, inclusion and sharing of lessons learnt from incidents to include partners and stakeholders	Complete	Via Water UK site on Resilient Direct there is now a lessons learnt page to share info with LRF. Other LRFs, other utilities e.g. power generation etc also shared.
Through the Water Resources South East WRSE forum - review the possibility of joint company gold teams for regional incidents	Complete	Now an action being led through Southern Water.
Contribute to the assessment review being undertaken on mutual aid, alternative water, crisis communication and emergency response.	Complete	New Water UK mutual agreement agreed as a result of Freeze/Thaw - old agreement based on regional areas, with group leader for all comms, who in turn escalated to DEFRA and Water UK.
Capturing social media contact details in our billing system to help provide regular updates to customers	Closed	Updating social media contact details for all key stakeholders. All direct social media contacts now being recorded in Hi-Affinity.
Put in place more regular proactive communication (text/email updates) for customers registered for our In Your Area service and pro-active texting customers for live updates.	Complete	Tested and in operation

Hold a workshop with local resilience forum members to define all communication channels available and understand local challenges - develop a memorandum of understanding between South East Water and parish councils on how to communicate during incidents.	Action Revised - Ongoing	
We have volunteered to host a two-day industry wide conference on customer engagement through communication campaigns and crisis communications	Action Revised- Ongoing	
Develop a social media forecasting approach and review governance for social media during an incident.	Complete	Started and first report complete.
As part of our Resilient Customer approach, develop an improved, stand-alone winter communication plan with improved messaging at the start of winter, and additional messaging when cold weather approaches	Complete	Updated communication plan signed off and being rolled out
Update communications plan to include channels to communicate with retailers and businesses.	Complete	Communication plan updated.
Hold a workshop with employees that hold communication responsibilities to review current practices and future communication tactics to maximise the use of all communication channels	Complete	Complete - hosted by an outside agency, the workshop was held on Tuesday 16 Oct and included staff from Communications and Customer Services. Further work is now ongoing to update our communications procedures.
Provide customers with free winter kits - through save water/save money website. To include pipe lagging, outdoor tap guard, tap card to locate stop tap and winter advice leaflet.	Complete	Ongoing - forms part of the Wrap up for Winter campaign.

Develop a geographically based communications crisis plan that captures local challenges and approaches	Complete	Specific comms plan for rural and urban areas - Parish Councils in rural area; Town and District councils in urban areas. Plan completed but will be continually reviewed.
Re-design our community trailer so it can be used as a customer help point, at bottled water stations	Complete	
Improve alignment of internal and external messaging so that staff always have the latest information to provide to customers	Complete	Staff intranet (Gurgle) now has an 'incident hub' to replace normal homepage during incidents. Designed as two way, with a discussion forum for inputting info during incident. Will also add Twitter feed to intranet to ensure common messaging. Will also make better use of companywide email messaging.
Develop new data mapping tools that will blend external data with our own to identify potential areas with high levels of vulnerability (i.e. pockets of elderly, disabled or unemployed customers)	Complete	Our phase 1 tool enables us to view vulnerability across the region and forms a key part of our Horizon Scanning activates. Our horizon scanning in year 1
Review the process for passing information in respect of vulnerability to our external suppliers to protect and provide relevant details of their circumstances. This will include passwords to prevent possible bogus callers and be compliant with GDPR.	Complete	Process used with Kent LRF during the event.
Rollout Braille ID passes for external visits to blind customers, to identify genuine employees.	Complete	
We will continue to promote our services for customers in vulnerable circumstances at events in our region, to increase the number of customers on our PSR.	Complete	Programme of events in place as per previous years
Continue to train customer facing teams to upskill on vulnerability, including dementia, autism, Samaritans, child protection.	Complete	New training module for new starters in Contact Centre now in place based on Vulnerable Customer awareness and training.

Implement TextLocal - a two-way text service for deaf customers to contact us in an emergency 24/7	Removed	We now have 2 way text options for customers as part of standard in hours services - through further analysis this was not considered a viable long term solution and therefore will not be implemented This focused need remains part of our overall service review and analysis with customers in regard to appropriate communication channel needs
Make our dedicated vulnerable customer phone number a free phone number for our PSR customers.	Removed	A freephone option for customers on our PSR was introduced In March 20. This has not proven to have a high uptake as our contact centre numbers are inclusive to customer landline or mobile bundles
Work with local healthcare NHS trusts to include a leaflet to direct readers who need extra help to our customer care team - following a successful trial with Kent Community Healthcare NHS Trust	Complete	Trial with Kent NHS Trust (c1.4 million people) leaflet for exiting patients. Initial uptake to PSR not very successful and will continue to be developed.
New strategy role to be created to improve our network and access to vulnerable support data.	Complete	Vulnerability Strategy Manager appointed
Pre-agreed provision of bottled water to parish councils so they can distribute to customers that have not self-selected onto our PSR.	Complete	Numbers have been pre agreed.
Contribute to the consultation being undertaken by Ofwat on GSS standards.	Complete	Agreed at executive to adopt new proposed GSS approach.

south east water

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