

One Year On

Report of the Water UK Flooding Implementation Group

Lessons learned from the floods of summer 2007

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Foreword

When Water UK asked me to chair an industry-wide review into the 2007 floods and the implications for water and wastewater companies I was pleased to take on what I considered to be an important assignment affecting the interests of water users everywhere. The services provided by the water industry are fundamental to public health, the environment and to a well-functioning modern society. Yet the floods exposed apparent vulnerabilities in the system that needed to be addressed.

I established a group of very senior industry representatives to review the events of two years ago and to consider recommendations that needed to be taken forward. I was very pleased with the support we received from all the water companies and from many others who submitted written evidence, gave up their time to meet us, and who provided valuable advice and direction. The close links we established with Sir Michael Pitt's team were especially helpful.

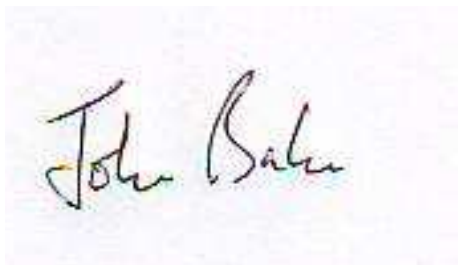
Since the Water UK flooding reports were published last year a great deal of work has been undertaken. I have been impressed by the speed and thoroughness with which our recommendations have been taken forward. We can now report significant progress in areas ranging from emergency response and review of Mutual Aid procedures, to building relationships and sharing information with other organisations involved in flooding. This work is reflected in this One Year On update.

Of course, there is still more to do, a fact which the industry fully acknowledges. We still need to improve communications when flooding occurs, to further our understanding of the consequences of flooding through improved modelling of the potential impacts of bad weather and intensive rainfall, using the best information available and sharing intelligence with others. Some of this, particularly around improving resilience (the ability of the water industry to protect customers from the impacts of floods), will be addressed as water company business plans are agreed and asset management plans are implemented. The emerging Flood and Water Management Bill will also be important.

But challenges for the future will remain. We have just seen the latest climate change projections for the UK and we know that the intensity of rainfall, the potential scale of floods,

and hence the severity of the possible impacts, are all going to become more important. In particular, water companies must continue to work in partnership, with each other and with others, to tackle surface water management and drainage, to share information and to develop responses to future flooding events.

We will not know the extent to which the steps that have already been taken have worked until the next major flooding event. But we do know that it is a question of when that event will happen, not if. But I am confident that, through the work the industry has done and continues to do, we will be better prepared next time.

A handwritten signature in black ink that reads "John Baker". The signature is written in a cursive style and is centered within a light blue rectangular box.

Sir John Baker

Chair of the Water UK Review Group on Flooding

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1 Introduction

1. In December 2007 and June 2008 Water UK published reports into the lessons learned from the summer floods of 2007 (the Baker Review) [Ref 1, Ref 2]. In June 2008 the Cabinet Office published the report of the findings of the review team chaired by Sir Michael Pitt (the Pitt Review) [Ref 3]. These reports contained actions for the water industry to ensure that water companies' role in planning for, mitigating and dealing with further events is clearer and more effective.
2. The Baker Review team focussed on the responses to the floods by the water industry and the lessons learned directly. It was an inward looking report and targeted recommendations at the water companies, their regulators and Water UK as the representative body.
3. The Baker Review recommendations are listed in Appendix 1. A traffic light analysis shows water company progress on the recommendations by June 2009. Green indicates good progress whilst red indicates that activity is still required.
4. The Pitt Review looked at the impact of floods on the wider community. Of the 92 recommendations, several have been highlighted as being of particular interest to the water industry. These are listed in Appendix 2.
5. Due to the collaborative approach taken by the Pitt Review team and the inclusion of Water UK and the water companies in the consultation process, the recommendations made by the Baker Review are complementary to those made by Pitt. As such the activity to address the recommendations made in the Baker Review also address the relevant recommendations in the Pitt Review.
6. To enable the industry to understand and act on the recommendations and actions that arose from the range of reviews and reports that arose following the floods of the summer of 2007 Water UK established a focus group to oversee activity against these. Details of the remit of the Flooding Implementation Group are shown in Appendix 3.

7. This report examines how the UK water industry has responded to the challenges following the floods of 2007. The report demonstrates where progress has been made and where more work needs to be done. It is structured around the recommendations from the Baker Review and references Pitt Recommendations where relevant.
8. Whilst there has been a significant amount of activity carried out either as a direct result of the floods or expedited by the events it has not been possible to complete actions against every recommendation. Some actions require input from other parties or will require longer time frames to complete.
9. Two key processes are in place that need to be completed before further activity can take place:
 - i. The approval of water company capital investment schemes as proposed in the final business plans. Final Business Plans are currently being assessed by Ofwat and draft determinations expected in July 2009 with final decisions in November 2009. Subject to approval by Ofwat, water companies will be able to progress with schemes to invest in improving resilience and further reducing sewer flooding from April 2010.
 - ii. Many of the recommendations made by the Pitt Review require legislative change to enable them to progress. Defra and WAG are currently consulting on its Draft Flood and Water Management Bill [Ref 4] which proposes the legislative framework that will enable for example local authorities to take responsibility for local flooding, allow development of sustainable drainage, change the manner in which reservoir safety is assessed and the manner in which all organisations co-operate and share pertinent information. In Scotland legislation is being addressed through the Flood Risk Management Bill [Ref 5] which implements the EA Floods Directive but also includes surface water issues. This has recently been amended to give additional duties to Scottish Water on sewerage systems.

2 Activity from Phase 1 of Baker Review – The Emergency Response

10. The recommendations in first phase of the Baker Review can be broadly classified into themes: preparedness and mutual aid; assumptions; communications; mutual aid and public health and recovery. Each of these areas contained recommendations to ensure that when water systems are put under stress by extreme weather conditions in future, the industry is in a better place to respond.

2.1 Preparedness and mutual aid

11. The Baker Review identified criticism from those caught up in the floods that water companies and other responders need to be better prepared and the response was often slow or inadequate.

12. The primary recommendation of the Baker Review was that water companies should carry out a thorough review of the emergency plans that are in place and update these bearing in mind that climate change would be expected to make future extreme weather events more frequent or intense.

13. Through its Emergency Planning and Security Focus Group Water UK produces a Security and Emergency Planning Manual which forms the basis of individual company emergency planning processes including Mutual Aid arrangements. Prior to the summer floods of 2007 this manual was in the process of being reviewed. The floods set a fresh context for this review and required tougher scenarios to be considered. The revised Emergency Planning Manual is due to be published by Water UK in summer 2009 and incorporated into revised individual company processes by autumn 2009. In spring 2010 there will be a National Water Emergency Exercise which will test out the emergency response capabilities in conjunction with other responders.

14. Water companies have plans for the deployment of alternative water supplies in the event of supply interruptions under the Security and Emergency Measures (Water and Sewerage Undertakers) Direction 1998 (SEMD) [Ref 6]. Included in this is the agreement for companies to provide emergency equipment to affected areas under the Mutual Aid Scheme. The process for Mutual Aid was revised and updated in

conjunction with the review of the Security and Emergency Planning Manual taking into account the practical lessons learned during the provision of alternative water supplies in Gloucestershire.

15. In addition to this review of the emergency planning process there have been other initiatives and activities that Water UK and / or water companies have been involved with. For example:

- Maintaining close working with Local Resilience Forums (LRFs) and response planning bodies and co-operation in the development of multiagency flood plans at Local Authority and LRF level.
- Development of plans for the provision of alternative water in the event of a major emergency when existing water company plans can not cope. Severn Trent Water, Thames Water and Bristol Water have inputted into a water distribution plan developed by Gloucester LRF. United Utilities have also developed a water distribution plan with LRFs in the north west of England.
- Revision by Defra of SEMD to increase volumes of water provided in the event of an interruption to supply to up to 20 litres per person per day. The new requirement will be time dependent and only apply after day 5 of an incident involving no water or “do not use” notices. Water company plans need to take account of the changes to SEMD, especially with bottled water contingencies. The industry has agreed to this but formal notification of this is awaited from Defra.
- Reviews of records held on sensitive or vulnerable customers were carried out and the water requirements assessed. Data can be augmented where necessary through local health authorities and charity groups (e.g. Help the Aged, home delivery meals services). It is recognised that the vulnerability of particular groups (e.g. the elderly) may vary throughout an emergency. Category 1 responders are best placed to advise Category 2 utilities of vulnerable groups requiring attention in particular incidents underlining the need for water company engagement in LRFs.
- Engagement in the government / Environment Agency (EA) reservoir emergency planning project and participating in emergency planning trials and in trials of inundation mapping techniques (United Utilities, Severn Trent Water, Northumbrian Water and Veolia Water Three Valleys).

- Local mutual aid arrangements developed between water companies on a regional basis above the commitments of the national scheme, e.g. Northern Mutual Aid (UU, Scottish Water, YWS, and NWL) with a joint contract with Wincanton Logistics.
- The establishment of local alliances, e.g. South West Emergency Preparedness Alliance (SWEPA) set up in 1998 to sustain and continually improve emergency preparedness in order to robustly and efficiently support customers.

2.2 Assumptions

16. The purpose of these recommendations was to encourage water companies to better understand the scale of weather events that impacted the UK in the summer of 2007 and to work with service providers to ensure that the most up to date, accurate and targeted data are available. Central to acting on these recommendations is the interaction of water companies, the Met Office and the environment agencies particularly in the ability to act upon flood warnings and to understand the risk of future events.
17. Examples of activity carried out to address these recommendations include:
 - In May 2009 Water UK hosted a workshop held with the Flood Forecasting Centre (FFC). The FFC will provide a range of services to all registered Category 1 and 2 emergency responders (water companies are Category 2 responders). The FFC will not be a one-stop shop and it is clear that water companies will need to continue to engage with their local EA and the Met Office for more detailed flood risk and weather information. The FFC is keen to develop further services and as such Water UK will maintain close working relationships.
 - Maintaining dialogue with the Met Office to develop and influence new services including the Extreme Rainfall Alert Service and incorporating these into water company business processes.
 - Water UK and a number of water companies contributed to Defra's National Floods Emergency Framework consultation.

2.3 Communications

18. During a major event, such as that seen at the Mythe Water Treatment Works, it is critical to provide consumers with information on water quality and arrangements for alternative supplies. Evidence to the Baker Review suggested that communication methods should be updated to take account of new technologies and consumer requirements. This would include how to get complex messages across to customers and the general public in a timely, effective and appropriate manner.

19. Water companies regularly communicate with customers, for example in connection with planned interruptions for maintenance, unplanned interruptions for emergency repairs, or communicating a water quality incident. Traditional communication methods (post, direct notification drop, recorded messages and web based information) can be augmented with new technology such as SMS, web-based social networks (e.g. Facebook), messaging (e.g. Twitter), or e-mail.

20. Examples of activity carried out to address these recommendations:
 - Water companies routinely keep their communication strategies under review. Recent events (e.g. Northampton cryptosporidium incident) have tested the strategies which are considered robust. Individual company, regional and national strategies have been developed.
 - Water companies are generally willing to share communication information nationally, but this may be limited as incidents tend to be local in nature and communications with consumers will need to reflect this. Communication strategies should take into account the ability to produce bespoke messages as well as to standard messages.
 - In major events it may be that individual company call centres are overwhelmed with the volume of calls. In these cases water companies will make use of overflow call centres and it will be advantageous for a standard Q&A document to be available.
 - Companies have reviewed arrangements for coordinating communication in partnership with other responders. They have also reviewed the potential for mutual aid in respect of communication expertise and, as appropriate, personnel.

2.4 Public health and recovery

21. It was clear during the outage at Mythe WTW as Severn Trent were preparing to restore networked supplies, initially for non-potable purposes, there were discussions over the manner in which consumers were notified. Gold Command had taken responsibility for distribution of information and required that written notification be provided. Health teams were insistent that these notifications should be received before any water could be provided. Normal water company practice would have been to use more rapid communication methods such as radio, TV, internet etc followed with written notification. This was not permissible. The Baker Review team considered that this led to unnecessary delays and that guidance should be developed to provide a protocol for use in future events.
- 22.
23. This guidance is currently being developed by the Drinking Water Inspectorate (DWI) with the Health Protection Agency (HPA). It is expected that this guidance will be launched in September 2009 and targeted at health professionals. The document is expected to be a statement of the regulatory framework for drinking water to achieve clarity for all practitioners plus a description of day to day practice by industry in dealing with adverse findings from a failure at a tap or a consumer complaint through to boil and “do not drink” notices.
24. Clean up after flooding events is usually undertaken by the owner of the particular asset. In the cases where this is directly attributable to a water company asset (for example through sewer flooding of individual properties) then assistance is given to the affected householder. However in cases where extreme weather results in surface water flooding the responsibilities are less than clear cut. In these situations water companies may take a common sense approach and provide assistance through local resilience forums, customer advice or directly to the householder as part of their community responsibility.

3 Activity on Phase 2 of the Baker Review – Long-term Issues

25. The report on the second phase of the Baker Review focussed on the longer-term issues that arose from the floods. These issues were categorised into - climate change; the resilience of infrastructure and improving surface water drainage.

3.1 Climate change

26. The Baker Review worked closely with the Met Office during the preparation of the Phase 2 report. The water industry has a history of understanding the impacts of climate change both in terms of long-term planning and emergency response to extreme events. The Review encouraged water companies to stay at the forefront of understanding the impacts of climate change. In the short-term companies can ensure that they are aware of the current scientific paradigms and that their planning processes and models are adaptable and flexible.

27. Water companies continue to build the expected impacts of climate change into all their planning and operational activities and are updating models to incorporate the latest climate change projections from the UK Climate Impacts Programme. The water industry, through UKWIR, has already initiated projects to embed the impacts of the new projections (UKCP09) in planning for both clean and wastewater services [Ref 7].

28. Work in progress - Climate change projections:

- Delays to the production of the latest climate change projections (UKCP09) mean that these have not been taken into account in business plan submissions. The impact of the new projections will need to be considered and any resulting changes to future investment plans agreed with regulators.

3.2 Protecting water industry services from disruption from flooding

29. Improving the resilience of the water and waste water systems to provide continual service in the event of extreme weather conditions will require significant investment over the long-term. This series of recommendations required that companies engage with regulators and the wider public to develop and explain risk based strategies for dealing with low-probability high-impact events.

30. Whilst the scenario that developed resulting in the closure of the Mythe Water Treatment Works in July 2007 was extraordinary it did highlight that there are vulnerabilities in water distribution systems that if affected can result in the loss of service to consumers. Water companies have been assessing this vulnerability and identifying cost-beneficial options for addressing these.
31. A risk based approach to improving asset resilience has been used by water companies in determining capital investment requirements as part of the PR09 process. Water companies have been working closely with local authorities, LRFs, customer groups and the regulators on development of investment plans. Nationally around £500 million¹ of investment has been proposed by water companies in their plans to improve resilience through protection of assets or provision of additional capacity. Providing that these are approved, priority schemes will begin in April 2010.
32. In addition to the proposals for improving the resilience of water services to extreme weather there have also been a number of other activities that have taken place. For example:
- Water companies have also included programmes for reducing sewer flooding in their final business plans. Nationally £1.4billion of investment is proposed to reduce the number of properties at risk of flooding caused by hydraulic overloading of sewers. Further reduction of sewer flooding can be achieved by reducing the burden of new developments on the sewer network. Water companies encourage developers and local authorities to consider applying a drainage neutral concept at the time of design.
 - Working with Cabinet Office Natural Hazards Group to understand better the impact of all natural hazards on infrastructure. .
 - Water UK has been contributors to the ICE State of the Nation report “Defending National Infrastructure” [Ref 8] which was launched in June 2009.
33. Work in progress - Standards for resilience:

¹ This figure is likely to be a minimum estimate, since investment in other areas (supply demand balance) will contribute significantly to resilience, even though it is not the main driver.

- The short time-scale between the publication of the Pitt report and the submission of final business plans has meant that it has not been possible to develop consistent standards for infrastructure resilience. In its absence companies have continued to take a risk-based approach, taking account of consequences of flooding as well as probability. National standards may need to be developed by the industry and regulators to aid future investment planning, but these should take account of all aspects of risk and of regional differences. The standards set will impact the level of investment required over the long-term.

3.3 Improving drainage and surface water management

34. When considering surface water drainage water companies need to take account of:

- the management of water on the surface prior to entering the sewerage network;
- coping with peak volumes of water once it does enter the system.

Surface Water Management Plans (SWMPs)

35. These plans are central to improving the way in which surface water is handled. The Pitt Review put the responsibility for these plans onto the local authorities (Pitt Review recommendations 14 to 18). Development of SWMPs is to be through partnership working. Water UK and water companies in England have been working closely with Defra and local authorities to develop the pilots and the six first-edition SWMPs. Defra is expected to agree to another series of SWMPs in high risk areas following the completion of the First Edition Plans in July 2009.

36. In Scotland the Metropolitan Glasgow Strategic Drainage Partnership (MGSDP) is working to relieve pressure on the area's existing drainage systems and relieve flooding, by developing and implementing 12 Surface Water Management Plans. The partnership includes Scottish Water, Scottish Environment Protection Agency, Scottish Enterprise and Glasgow City Council, North Lanarkshire, South Lanarkshire, East Dunbartonshire, West Dunbartonshire, Renfrewshire and East Renfrewshire councils. Sustainable Urban Drainage Systems (SUDS) are a key component in achieving the multiple objectives of the Surface Water Management plans which also include amenity and biodiversity improvements. One of these plans, the South

Dalmarnock redevelopment project, is now at an advanced stage and will be delivered by 2014 in time for the Commonwealth Games in Glasgow.

37. A central part of the future production of SWMPs is the availability of the appropriate data. Water UK and the EA have developed a protocol for sharing relevant information between the two organisations. This was approved by the EA Board and Water UK's Council in May 2009 and is currently being rolled out. The next stage of the development of the protocol will be to consider ways to include other SWMP partner organisations. This directly actions recommendation 5 of the Pitt Review and begins to address recommendation 17 which calls for closer sharing of data amongst organisations with responsibility for flood management. Whilst water company corporate data systems are designed primarily for internal needs, most systems are flexible enough to provide data in suitable formats for sharing. Where there are development costs involved in providing this flexibility individual companies will approach this with regulators. Ensuring a suitable IT system is a requirement under Pitt Review Recommendation 44.

Sustainable Urban Drainage Systems (SUDS)

38. SUDS are an important option in managing surface water drainage, particularly from new developments, to reduce the burden on the sewer network and the environment. A number of barriers exist to the successful use of SUDS that need to be considered through legislative change. Water UK and water companies continue to contribute to the National SUDS Working Group² to address these issues in England.

39. In Wales, the Welsh Assembly Government (WAG) has formed an Integrated Surface Water Management Group with representatives of the Environment Agency, the Welsh Local Government Association and Dwr Cymru Welsh Water (DCWW). Working with the WAG, DCWW have included proposals for a number of trial schemes aimed at reducing surface water flows to sewers, and finding ways of overcoming some of the barriers to SUDS through collaborative working with all stakeholders.

² The National SUDS Working Group is a coalition of government, water companies, regulators and developers with an interest in the development and management of sustainable drainage systems.

40. In Scotland SUDS are legal requirements for the treatment of surface water from all new developments since 2006. Scottish Water is legally responsible for the adoption of SUDS which perform the drainage function that is their responsibility. This only includes the drainage of rainfall runoff from the curtilage of buildings generated by small storm events (less frequent than 1 in 30 years) leaving the responsibility for dealing with road drainage and flooding with the Local Authority. Scottish Water is working with the Local Authorities and the Scottish Government to develop agreements for the shared responsibility of SUDS leading to fully integrated management of surface water.
41. Building regulations require that new developments consider the use of SUDS before considering using the public sewer system as a mechanism for removing surface water. This reflects the water industry position that sewers should be for sewage. Clarification of SUDS issues in England and Wales is expected to be addressed through the Flood and Water Management Bill which is currently under consultation.
42. Work in progress - Standards for Sewers:
- Recommendation 21 of the Pitt Review calls for Defra, Ofwat and water companies to develop risk based standards for public sewerage. Water UK is represented on the development of a BSI standard on “Flood mitigation for new development – Code of Practice”. This code of practice stems from the Pitt Review and looks at “bridging the gap between regulation and the finished design of new development as regards flood mitigation.”

4 Conclusions

43. The Water Industry has responded to the recommendations made following the summer floods of 2007. Acting either as individual companies, as an industry or in partnership with government, regulators or professional bodies, progress has been made on a range of topics both in the manner in which the industry responds to and communicates flood events as they occur and also the manner in which the industry plans for mitigation of, or adaptation to, future flooding.
44. There remains activity still to do. This activity is primarily reliant upon external processes, approval of capital investment programmes and a new legislative framework. In the meanwhile activity is underway to embed changes into “business as usual” activity. (e.g. weather forecasting improvements; joined up working with Category 1 responders).
45. Whilst it is impossible to predict where the next flood event may occur, its severity or its impacts it is clear that the Water Industry and society as a whole needs to be better prepared to manage. The activity carried out by the Water Industry has put it in a better place to deal with future events and on-going activity will further strengthen this ability.

5 References

1 - Lessons Learned from Summer Floods 2007, Phase 1 report - Emergency Response - Water UK's Review Group on Flooding. February 2008.

<http://www.water.org.uk/home/news/press-releases/flooding-review-phase-1-4-feb-08>

2 - Lessons Learned from Summer Floods 2007, Phase 2 report – Longer term Issues - Water UK's Review Group on Flooding. July 2008.

<http://www.water.org.uk/home/policy/reports/flooding/flooding-report-phase-2>

3 - The Pitt Review, Lessons Learned from the Summer 2007 Floods – The Cabinet Office, June 2008. <http://archive.cabinetoffice.gov.uk/pittreview/thepittreview.html>

4 - Consultation on Draft Flood and Water Management Bill, Defra, April 2009

<http://www.defra.gov.uk/corporate/consult/flood-water-bill/index.htm>

5 - Flood Risk Management (Scotland) Bill (SP Bill 15), Scottish Parliament, June 2009.

<http://www.scottish.parliament.uk/s3/bills/15-FloodRisk/index.htm>

6 - The Security and Emergency Measures (Water and Sewerage Undertakers) Direction 1998, Defra, 1998. <http://www.defra.gov.uk/corporate/contingency/documents/water-sem98.pdf>

7 - UK Climate Projections 2009, UKCP09, June 2009. <http://ukcp09.defra.gov.uk/>

8 – The State of the Nation – Defending Critical Infrastructure, Institution of Civil Engineers, June 2009 http://www.ice.org.uk/state_of_the_nation/index.asp

Appendix 1 – Summary of Baker review recommendations

Baker Ref	Recommendation	Status ³
Phase 1 - 1	Water companies put in hand a thorough review of their emergency response and contingency plans on the assumption that the sheer scale and severity of future floods may make current plans inadequate.	
Phase 1 - 2	Water companies and Water UK should work closely with the Met Office and the environmental agencies further to develop specific industry requirements for weather information and advanced severe weather warnings and to obtain a better understanding of the potential severity of rain storms that might give rise to large scale flooding events.	
Phase 1 - 3	Water companies and Water UK should continue to work with the environmental agencies to build on existing generic and company specific flood forecasting tools to include, for example, depth as well as extent of flooding, and in particular to identify key infrastructure, such as treatment works, pumping capability, and the siting of emergency centres and supplies, that may be at greater risk than currently understood.	
Phase 1 - 4	Water companies should ensure that they are appropriately involved with all key agencies in planning, training and rehearsing for critical incidents. These would include public health bodies, social services, statutory consumer organisations and animal welfare agencies in addition to the emergency response organisations, government departments and command structures. In particular we recommend that the relevant water companies be included in the Gold and Silver Emergency Command Structures in order that all parties can familiarise themselves with the working methods of such structures, ensuring that understanding of the roles and responsibility is constantly refreshed and takes account of staff turnover.	
Phase 1 - 5	Water companies, highways authorities, private asset owners and other organisations with responsibility for provision and maintenance of data should review the data and information that are available within the sector and that could be securely shared amongst key stakeholders to better aid the planning and response process. Areas where data may not be available should be identified and solutions proposed to redress these gaps.	
Phase 1 - 6	Water companies and any other organisations with a responsibility to provide equipment under Mutual Aid Scheme should ensure that this equipment is kept in a roadworthy and clean condition at all times to ensure that response times to emergency events are kept to a minimum.	

³ The status of these recommendations was determined in May 2009 prior to publishing this report. Those actions where activity is still underway are currently being progressed or waiting for outcomes from external bodies.

Baker Ref	Recommendation	Status 3
Phase 1 - 7	Water companies should take a fresh look at the potential vulnerability of their key assets, including the risks from other utility service failures, and then harden those sites as best they can against the higher levels of risk now emerging. In the short-term, this may involve the deployment of temporary measures. In the longer term substantial investment may be required.	
Phase 1 - 8	Through Water UK water companies should review with drinking water regulators and public health organisations the likely scale of consumers' requirements for water during emergency events and how this requirement may change throughout an event. We recommend that plans for the provision of emergency drinking water supplies should take as their starting point that each person should be supplied with a minimum of 20 litres a day (i.e. twice the current assumption).	
Phase 1 - 9	Water companies should review the efficacy of their emergency supply assets to cope with such minimum levels (e.g. bottled water supply chain, numbers and location of bowsers and tankers). Dialogue with supermarkets and other bulk providers of bottled water should also ensue to determine how best to ensure adequate supplies during emergency events.	
Phase 1 - 10	Water companies should ensure that they maintain a full and up to date register of key stakeholders and contact lists for organisations responsible for vulnerable consumers, and of any special communication requirements they may have. These registers should be accessible by overflow call centres and emergency response teams. The registers should highlight in advance the appropriate actions required for each group of vulnerable consumers, including farm animals. Companies should also consider any limitations of bottled water supplies for consumers with specific medical needs or infants.	
Phase 1 - 11	Water companies should undertake to review their communication strategies for addressing customers, the wider public, other agencies and the media during emergencies to ensure that they are suitable for widespread service failure.	
Phase 1 - 12	Water companies should consider developing proforma standardised text and vocabulary to ensure that messages to consumers are consistent across and between water companies and that this consistency is maintained in the event of the use of emergency or overflow call centres.	
Phase 1 - 13	Water UK should use its existing emergency planning and security network to review the state of preparedness of the industry for future events; in particular the industry's Mutual Aid Scheme should be reviewed.	
Phase 1 - 14	Through Water UK the water industry should address the standardisation of emergency supply equipment to ensure that in the event of an incident equipment from other companies or organisations is compatible.	

Baker Ref	Recommendation	Status 3
Phase 1 - 15	Water companies should rehearse emergency plans on a regular basis. This should include physically moving equipment within individual company areas and ensuring with other companies that provisions under the conditions of Mutual Aid Scheme are available. These rehearsals should include the emergency response organisations. Such rehearsals should include scenarios allowing for disruptions to access to sites and locations due to flooded roads and facilities.	
Phase 1 - 16	Through Water UK the water industry should establish a standard approach to the temporary use of non-potable water to restore sanitation supplies, clearly outlining the conditions and situations in which it should be considered as an option. To deliver this standard the industry will need to work at a national level with government, statutory consumer organisations, public health bodies and drinking water regulators.	
Phase 1 - 17	Water companies should give post-event clean up operations further consideration as an opportunity to recover service to customers including in situations where responsibility is not directly attributable.	
Phase 1 - 18	The Review Group's final recommendation is that an appropriate group is established to oversee the actions on these recommendations, and those of other reviews, and to identify an appropriate method of reporting progress. This group should be governed by Water UK and should take its membership from water companies and other organisations with the appropriate knowledge and influence to complete the actions required.	
Phase 2 - 1	Water companies must keep their focus on the impacts of climate change and weather forecasting, even if there is a lull before the inevitable next floods. Companies cannot work in isolation and must liaise closely with the Met Office. They need to share their knowledge, thinking and plans with the other parties who are involved in flood protection - the Environment Agency, local authorities, other utility suppliers - and with customers and customer bodies	
Phase 2 - 2	Water companies need to ensure their own data are as complete and up-to-date as possible, and recorded in ways and on IT systems that are compatible with the needs of other parties	
Phase 2 - 3	The Review Group considers that risk based standards need to be developed that set the minimum levels of protection to be afforded to vulnerable sites and groups of customers. We believe these standards should seek to define risk in terms of levels of supply interruption that ought not to be exceeded.	
Phase 2 - 4	Water companies both collectively and individually should continue to engage in dialogue with regulators to agree how best to determine investment plans for low probability, high impact events. As a minimum they should include the investment schemes that have been identified as priorities through their risk assessments in their business plan submissions. Economic regulators should accept their inclusion in the water company's investment programmes for the purpose of setting price limits	

Baker Ref	Recommendation	Status 3
Phase 2 - 5	The water industry needs to engage with the EA and local authorities to define precisely what role the water companies are to play in managing surface water and how collaborative working is to be organised	
Phase 2 - 6	Water companies should continue to promote integrated and sustainable approaches to surface water drainage. They should work to overcome the barriers to these systems that are within their influence and help other parties to overcome theirs.	
Phase 2 - 7	Water companies should develop plans to improve the sewer network where this is the best option. They should prioritise activity based on cost benefit analysis and include the most urgent schemes in their business plan submissions	
Phase 2 - 8	Water companies should give consideration to the development of 25 year plans for waste water management to complement those already in place for water resource management	

Appendix 2 – Key recommendations in Pitt Review

In total 92 recommendations were published in the Pitt Review. Listed below are those where the Implementation and Delivery Guide recognised water companies or Water UK as supporting organisations.

Rec	Description
5	The Environment Agency should work with partners to urgently take forward work to develop tools and techniques to model surface water flooding
14	Local authorities should lead on the management of local flood risk, with the support of the relevant organisations
15	Local authorities should positively tackle problems by working with all relevant parties, establishing ownership and legal responsibility
16	Local authorities should collate and map the main flood risk management and drainage assets (over and underground), including a record of their ownership and condition.
17	All relevant organisations should have a duty to share information and co-operate with local authorities and the Environment Agency to facilitate the management of flood risk.
18	Local surface water management plans as set out under PPS25 and co-ordinated by local authorities should prove the basis for managing all local flood risk.
20	The Government should resolve the issue of which organisations should be responsible for the ownership and maintenance of sustainable drainage systems.
21	Defra should work with Ofwat and the water industry to explore how appropriate risk-based standards for public sewerage can be achieved.
40	Defra should amend emergency regulations to increase the minimum amount of water to be provided in an emergency, in order to reflect reasonable needs during a longer-term loss of mains supply.
44	Category 1 and 2 responders should address the effectiveness of their emergency response facilities, including flexible accommodation, IT and communications systems and undertake any necessary improvement work.

Appendix 3 – Water UK Flooding Implementation Group - Terms of Reference

Objective

To follow through and oversee the implementation by the water industry of recommendations from various flooding reviews

Role and activities

- To review recommendations in ongoing and completed flood reviews, including Water UK Flooding Review, Pitt Review, EFRA committee, Environment Agency, Ofwat and DWI reviews, other reviews by devolved governments, regulators and organizations in Wales, Scotland and Northern Ireland, Association of British Insurers
- To identify how recommendations should be implemented and by whom
- To develop and carry out an action plan for implementing recommendations
- To communicate, work with and delegate actions to other Water UK and industry groups as appropriate
- To liaise with Government, regulators and others as appropriate
- To monitor and advise on implications of legislation and policy documents, e.g. Future Water, Climate Change Bill, Floods Directive
- To report regularly on progress to Water UK Council
- To assist Water UK's Review Group on Flooding develop workshops to assist in the delivery of Phase 2 of the Baker Review
- To oversee the industry's response to the ongoing consultation on surface water drainage

Membership of the Flooding Implementation Group

Bayliss, David, Dwr Cymru Cyfyngedig
Brown, Buster, South West Water
Chung, Tung K, Dwr Cymru Cyfyngedig
Clarke, Niall, United Utilities
Conlin, Jim, Scottish Water
Coombes, Robert, United Utilities
Gelder, Phil, Severn Trent Water
Griffiths, Tony, United Utilities
Hickey, Paul, Anglian Water
Horton, Bruce, Water UK
Luck, Barry, Southern Water Services
Marshall, Jim, Water UK
Mills, Phill, Water UK
Morrow, Brian, United Utilities
Ogborne, David, Wessex Water
Pitcher, Lee, Yorkshire Water
Ridgers, Don, Thames Water
Wallis, Bryan, Water UK
White, Simon, Anglian Water Services
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