

Appendix 3.4

RESILIENCE FRAMEWORK INDEPENDENT ASSESSMENT

September 2018

Independent Assessment of your Resilience Framework

*Northumbrian
Water Group
Limited*

Confidential

July 2018



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1. *Executive Summary*

The review we have conducted confirms that NWL (“Northumbrian Water Group Limited”) are, based upon the evidence we reviewed, complying with the majority of Ofwat’s guidance on resilience. This is reflected in the fact that a good level of progress has been made in improving the resilience of the organisation in the past three years. Since the last review of NWL’s resilience arrangements that was conducted in 2015, this has included a number of improvements in relation to several risk areas typically considered non-core to a water utility company, such as people, cyber and business continuity. Furthermore, this work has extended to a wide variety of other activities in terms of engaging customers to establish their views on resilience as well as embedding the use of partnerships in order to more effectively manage catchment areas across each region. All of these activities demonstrate NWL’s willingness to build and maintain customer trust, a factor that is crucial to building a resilient organisation.

Whilst we recognise that the organisation has moved forward in respect of its resilience in recent years, our review identified a number of further improvements that should be made as part of the next AMP. We regard these improvements necessary to ensure that the business adopts an integrated approach to its resilience arrangements, consistent with both Ofwat’s guidance as well as wider resilience practices featured in other industries. Accordingly, the ratings included in this document are designed to help focus management’s attention as to where we believe NWL, in looking ahead to the future, can improve their resilience arrangements further. The improvements include:

- Completing further work to embed the use of risk appetite as part of Board sub-committee reporting as well as developing a formal set of Key Risk Indicators (KRIs) that allow for monitoring of risks against the approved risk appetite;
- Reviewing the Corporate Risk Register to allow for better analysis of the types and general effectiveness of controls being adopted across the business;
- Completing the planned review of policies and procedures so that these documents can reflect the relationship between department processes. This will allow for a more integrated approach as to the development of policy standards and controls;
- Reviewing the use of more general risk reporting so that a wider (and more visual) range of risk reports can be developed in order to provide management with any new or additional insights;
- Reviewing the use of stress tests by focusing them not only financial resilience but also corporate and operational resilience events as well;
- Completing ongoing work to update the group of business cases that relate to enhancements so that these documents can be produced in a format that consistently reflects any risks;
- Ensuring small projects / business changes are considered with respect to any risk implications; and
- Developing succession plans for key staff, whether that be at strategic or technical level.

Based upon the above, we recommend that management should consider the recommendations highlighted. In reading this report, management should be aware that the subject of resilience, and what good resilience looks like, is likely to evolve in the next few years. Our experience is that this is already happening across a number of different industries; however, this also creates an opportunity to understand and embed what good resilience looks like.

2. Background and Scope

As part of its approach to PR19, Ofwat has published its expectations as to how organisations should assess, prioritise and address the range of risks to resilience (from the operational, financial and corporate perspectives).





In particular, in its document “Delivering Water 2020: Our final methodology for the 2019 price review”, Ofwat has specified that companies should publish the results of their assessments of resilience risks, and the actions taken or planned to address the risks. In performing its analysis of these resilience risk assessments, Ofwat has stated that it will consider the extent to which assurance has been obtained both from the Board and from third parties.

As part of the scope, our approach was to conduct:

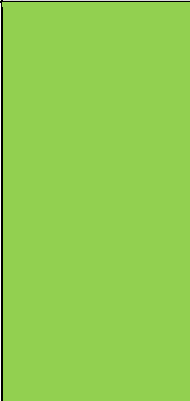
- 1) Interviews and evidence inspection, to gain an understanding of:
 - The approach to initially identifying risks to Financial, Operational and Corporate Resilience;
 - The risks which were identified as part of this process, and the priorities and impacts assigned to those risks;
 - The risk appetite applied in making any assessment, and the rationale for this risk appetite;
 - The actions taken, and action plans developed, to mitigate and address the identified risks;
 - The processes in place to, on an ongoing basis, monitor those risks and identify emerging risks or those risks with a changing profile; and
 - The assurance (whether internal or external) obtained as to NWL’s management of resilience.
- 2) In doing so, consider the extent to which the approach undertaken, and the actions and / or proposed, are aligned to and address:
 - Ofwat’s Resilience Framework, including its “Resilience in the Round” document and its “Delivering Water 2020: NWL’s final methodology for the 2019 price review” (specifically section 5 “Securing long term resilience”); and
 - Recognised good and best practices in Risk Management and Resilience planning.
- 3) Through inspection of the PR19 business plan, and comparison against the understanding we have built into stages 1 and 2 above, consider the way in which the approach to resilience risk identification, management and mitigation is presented within the PR19 document.

3. Assessment of Northumbrian Water Resilience Framework

As part of this review, we assessed evidence presented by NWL that underpins their Resilience Framework and established how this compares to the Ofwat guidance. A copy of the Resilience Framework can be found in Appendix C. We have divided the wheel categories below and given a RAG rating to show NWL’s assessment. This assessment is based upon the following criteria:

Rating	Assessment Rationale
	Significant gaps against Ofwat guidelines
	Partially addresses Ofwat guidelines
	Largely addresses Ofwat guidelines
	In line with Ofwat guidelines. In some instances, opportunities for further enhancement have been identified. See individual findings for full details.

More detailed analysis against Ofwat’s PR19 resilience methodology can be found in Appendix A.

Resilience Area	Business Outcomes	Scope Areas	Key Findings / Recommendations	Rating
CORPORATE RESILIENCE	See all areas below	See all areas below	<p>Finding #1 The work to define NWL’s risk appetite has been discussed and approved by the Risk & Compliance Committee. This considers seven areas (or consequences) of risk, which have then been defined in terms of the level of risk that should be taken with respect to these areas. This work has subsequently been communicated to the Executive Leadership Team and the team of Risk Champions at a department level. Risks that are assessed as being outside of risk appetite (based upon an agreed risk assessment score) are, at the discretion of the Risk & Compliance Committee, subject to a deep dive by the respective risk owner, which is presented to the Committee for discussion. This is a chance to ensure that an appropriate level of action can be taken in order to protect the business and ensure it remains adequately resilient to any losses.</p> <p>Our review of a sample of the deep dive reviews suggested that they could be made more explicit by referencing not only how the risks and issues described link to specific risks on the risk register (we noted that just one of the reviews did this) but also who is accountable for any actions and their respective completion date(s). The papers would also benefit from being more explicit in terms how this risk links to NWL’s strategy as well as its ability to comply with the relevant areas of the</p>	

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			<p>work on risk appetite. For instance, if it is felt the delivery of the recommended actions will bring the business back into risk appetite this should be made clear in the reporting in order to focus the Committee's attention. Equally, any weaknesses in any controls on the risk register that impact on risk appetite should also be referenced so as to assist with ensuring management spend adequate time considering the resilience of these controls.</p> <p>In terms of monitoring adherence to the risk appetite statements, there is no formal set of Key Risk Indicators (KRIs) that allow for the monitoring of compliance with these statements. Whilst we were advised a large number of metrics exist at an operational level, which link to different areas of risk and performance, these are not directly visible at a Board or Board sub-committee level. The business has expressed its concerns over the need to develop a specific set of KRIs that can be used in this way based upon the level of time / effort this could potentially demand. However, our experience of this type of activity is that it should aim to develop a set metrics that focus on NWL's principal areas of risk and should link to the Board's risk appetite. These metrics should then aim to inform senior management of any instance where this risk appetite might be about to or has been breached.</p> <p>Recommendation Review the format of reporting completed for the deep dive reviews so that this explicitly references the relevant areas / outputs relating to the Risk Management Framework e.g. risk registers, risk appetite, etc.</p> <p>Develop a formal set of KRIs that can be approved and monitored by the Risk & Compliance Committee in line with the comments above.</p> <p>Internal Audit should formally consider risk appetite as part of their assurance activity in order to assess whether departments are effectively using risk appetite as part of day-to-day decision-making.</p> <p>Finding #2 The Corporate Risk Register details the controls that are performed against each risk as part of its ongoing management. These controls are then assigned a collective rating in terms of their effectiveness in mitigating the described risk. In addition to this, NWL maintain an assurance map, which determines the level and type of assurance activity that is conducted in the business. It is the role of the assurance provider to understand the nature and type of any controls in place so that they can make an independent assessment of the control as part of this work.</p> <p>A further improvement to this activity would be for a periodic report to be provided to the Executive team and Risk & Compliance Committee that details the type of controls being used to manage NWL's key areas of risk (determined by its risk appetite), as well as an understanding as to the frequency of these controls or whether they are manual or automated in nature. We did note that control types are referenced within the NWL Risk Management Framework although, based upon the evidence we reviewed, they did not explicitly feature in the reporting.</p> <p>In addition, it would be beneficial to assign each control with an individual effectiveness rating. This would allow management to have better visibility to controls that are either partially effective or not effective based upon their control type. At a portfolio level, it would also allow for further analysis to be conducted into, for example, the reliance on certain types of controls. Our experience is that risk reporting that clearly details and provides insight into the types of controls</p>	

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			<p>in operation can provide a more informed view as to the quality of the control environment. This information can also be used to inform any assurance activity as well as consider the ability of the business to manage and withstand stress events based upon the risk profile of the organisation.</p> <p>Recommendation Based upon the comments above, review the use of reporting that is provided to Risk & Compliance Committee with respect to the ongoing review and analysis of controls on the Corporate Risk Register.</p> <p>Finding #3 The Internal Audit team noted that the use of policies and procedures could be improved where these documents cross departmental boundaries. Further work in this area would allow for streamlining the number of procedures and making the review process more efficient. Work on this activity has begun as part of a plan to ensure that any procedures are re-written in order to focus on business processes that run across departments (rather than those in departments that exist in silos). Subsequently, 100 key business processes have been identified albeit this remains work in progress (at present there are 400 procedures). It has been noted it will take a considerable resource effort to re-write the documents and complete the exercise in an effective way. This exercise should therefore be re-visited and re-prioritised in line with other business activities.</p> <p>Recommendation Complete the project to review and update the current policies and procedures in place across NWL.</p> <p>Finding #4 Risk registers are largely tabular in format, which has meant that any risk MI and reporting is somewhat limited compared to some other utility companies who have begun to adopt a wider range of risk MI and reporting. This includes the use of risk dashboards and / or other methods that allow data to be extracted from a variety of sources and visualised in different ways. The objective of these reports should be to provide insight and help prompt further analysis / debate in terms of the way risk information is shared with an audience. The current risk reporting could therefore be improved to understand how differing reporting approaches could be adopted to facilitate improved decision-making. This may benefit from being partly automated by way of the NWL's new risk system, which will be capable of producing this type of reporting. This will help increase the speed and efficiency by which this reporting can be produced.</p> <p>Recommendation Review the use of risk reporting both at a Board, Board sub-committee and department level in order to explore alternative methods of producing and displaying data.</p> <p>Finding #5 The Internal Audit Manager advised that the Assurance Forum has not had the opportunity to meet this calendar year due to the number of competing business priorities. This meeting involved several departments meeting to review progress made against any agreed assurance activity. The departments in attendance included Business Continuity, Health, Safety, Quality, Information Security (IS), Scientific Services and Internal Audit-</p> <p>Recommendation Review the role of the Assurance Forum and consider whether it should A) continue to meet and B)</p>	

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			<p>if it should, what steps should be taken to ensure that it can operate effectively as a meeting.</p> <p>Finding #6 The Risk Management Framework refers to the Board being responsible for “setting the tone and influence the culture of risk management within the Group”. Work has been completed to define NWL’s visions and values (as part of “Our Way”). In addition, an annual review is completed to consider the extent that ethical decisions are taken across the business. Both of these areas are supported by Internal Audit who have the opportunity to input into and challenge this work. At present, however, NWL’s approach to risk culture has not been defined in the Risk Management Framework. Good practice would be to document this view as part of the document in order to ensure that it aligns and remains consistent with other elements of the Risk Framework.</p> <p>Recommendation Update the Risk Management Framework to articulate the Board’s view in terms of what NWL’s risk culture should consist in terms of approach, taking into account the areas mentioned above. It is recommended this work should then be aligned to the Great Place to Work and Workforce 2025 initiatives, both of which are currently ongoing.</p>	
FINANCIAL RESILIENCE	NWL’s finances are sound, stable & achieve a fair balance between customers & stakeholders	1. Financial monitoring & reporting	No issues to raise.	
		2. Long Term financial planning	<p>Finding #7 Financial resiliency tests are presently completed in relation to financial events only. Whilst this is in line with Ofwat guidelines, they do not account for either operational or corporate stress events. Whilst the work on cyber and business continuity has considered its own scenarios independently, these are not shared with Finance (and vice versa).</p> <p>A more integrated approach would be to conduct stress testing that considers a combination of these areas so that different departments can be involved in and consider the outputs from the process. This type of exercise can also be used as a way of identifying potential improvements to the control environment. An example of this might be a business continuity scenario so that the resultant direct and/or indirect costs can be considered. A source of these scenarios for NWL might be the HILL (High Impact Low Likelihood) report, which is reviewed by the Risk & Compliance Committee.</p> <p>Recommendation Define a series of scenarios (either internal or external events) that could have a major impact on NWL. These should then be considered as part of a series of workshops involving stakeholders from both the corporate, finance and operational teams to consider what the resulting losses could be and what controls are in place to prevent / manage their occurrence. The results should be reported to the Risk & Compliance Committee.</p>	
		3. Affordable services for customers	No issues to raise.	

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OPERATIONAL RESILIENCE	See all areas below	See all areas below	<p>Finding #8 We noted that the business is reliant upon the role of the department Risk Champions, a role that is designed to help embed risk locally within each department. The Champions play a key role in identifying and reporting on risk to either the Executive or the various committees. These people are not formally trained in risk management or from a risk management background. Furthermore, whilst they receive ongoing coaching they have not received any formal training to allow them to perform effectively in the role. KPMG were appointed on an advisory basis to support to these people with some guidance in terms of the use of risk terminology; however, this support and training should be developed further so that these individuals are able to operate both consistently and effectively. It was noted that a challenge over the amount of work the Risk Champions achieve has previously come from both Internal Audit as well as the Executive team who have both previously suggested they could be more effective in terms of their ability to do more.</p> <p>Recommendation Develop a formal development programme for the Risk Champions that allows them to receive training and support based upon their personal backgrounds, skills and experience. This should include subjects such as risk appetite, risk identification, risk assessment, risk mitigation and risk reporting.</p>	
	We protect & enhance the environment in delivering NWL's services leading by examples	4. Resilient Water environment & ecosystems	<p>Finding #9 The NWL business plan notes that a water trading plan will need to be developed as part of PR19 in order to consider what happens to any water surplus within the Northumbrian Water region. An owner and delivery timeline for this work should be agreed in order to ensure for its effective delivery.</p> <p>Recommendation Develop a water trading plan as part of the PR19 business plan.</p>	
		5. Sustainable management of NWL's waste	No issues to raise.	
		6. Sustainable & efficient use of energy	No issues to raise.	
	We deliver water & sewerage services that meet the needs of current & future generations	7. Understanding Customer priorities	No issues to raise.	
		8. Planning for resilient services in the long term	<p>Finding #10 The Resilience Framework does not reflect the different approaches adopted by NWL to consider resilience risks over the short, medium and long term. The need to consider resilience over an extended timeline in particular is seen as a priority by Ofwat to ensure that businesses remain resilient over a long-term period. It is recommended therefore that this is reflected as a component within the illustration of the Framework so that anyone who reads the document can easily recognise this.</p> <p>Recommendation Update the Resilience Framework so that short, medium and long-term resilience planning feature as part of the illustration.</p>	
		9. Resilient Water services	<p>Finding #11 At the time of our review, a number of business cases were reviewed relating to both water and wastewater, which we noted were inconsistent in both format and written quality. In several of the</p>	

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			<p>documents, very few risks were identified or, where they were, they were described in either a vague or unquantified manner. Equally, there was limited evidence of robust, objective and quantitative assessment. In some of the business cases, there was insufficient detail to identify the owners of different risks or else the transferal of risk ownership through the life-cycle of the project.</p> <p>Following a further discussion with management, we were advised that the business cases had been subject to assurance reviews both internally and a third party. We understand this resulted in the business case template being updated and standardised. Subsequently, all of the business cases had been re-drafted in order to ensure the points mentioned could be addressed. We were advised this work is still ongoing.</p> <p>Recommendation Continue the work mentioned above ensuring that the above points are addressed for all business cases.</p>	
		10. Business Continuity & recovery	<p>Finding #12 It was noted that the Business Continuity function sometimes becomes aware of small projects and/or business changes after they have been implemented. This has meant that any business continuity enhancements or changes to the present recovery plans then have to happen after their implementation. Small projects would therefore benefit from a defined process that ensures any business continuity or other resilience implications can be considered in advance. Furthermore, where a relevant risk area does need to be raised this should be subject to a formal sign off to ensure they are given adequate opportunity to either accept any associated risks or confirm their closure.</p> <p>Recommendation Develop a process so that small projects / business changes can be considered (and approved) based upon the status of any potential risks.</p> <p>Finding #13 Formal succession plans do not presently exist for staff at either senior manager or Board level. The development of these would allow management to understand which members of staff would be well placed to “step into” these roles should the circumstances required. In addition, these documents could also be used as a way of ensuring appropriate staff are identified and are provided the necessary development to move into specific roles in the future. This is often particularly important for technical or specialist roles.</p> <p>Recommendation Develop a formal succession planning process to include (as a minimum) all members of the Board, Executive team as well as those in specialist / technical roles.</p> <p>Finding #14 It would be beneficial to complete a profiling exercise to consider the propensity of key senior staff to take risk, particularly in situations where they might be subject to periods of stress or an emergency situation. Experience demonstrates that different personality types have attitudes and approaches with respect to risk taking and it is likely to assist the business in furthering its resilience capabilities if this was to be considered further. This can also be particularly important where individuals perform technical or specialist roles.</p>	

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			<p>Recommendation Complete an exercise that considers the individual profile of the Board and Executive team to take risks based upon their personality / character type.</p> <p>Finding #15 A process should be developed to ensure the Business Impact Analysis (BIA) is updated in line with any changes to strategy. As a minimum, this should always be done annually; however, this should also happen wherever there is a significant organisational or strategic change.</p> <p>Recommendation Ensure the BIA is updated based upon any planned strategic changes.</p>	
		11. Resilient waste water services	<p>Finding #16 See also comments in #12.</p>	
	We are an efficient and innovative company	12. Enhance Cyber security & data protection	<p>Finding #17 Some of the risks that NWL face, particularly in relation to technology, are subjective in nature in that it is difficult to predict the extent that the profile of these risks will change over a prolonged period (e.g. more than 5 years). This differs from many of the infrastructure risks the business faces, which based upon the experience and knowledge within the business, can more easily be considered over the long-term. As such, these types of risks should be closely monitored so that any planned investment or improvements to the control environment can be reviewed in terms of their ongoing benefit. Equally, where it is determined that a control is less effective than it was previously believed to be this should be reflected in the risk reporting.</p> <p>Recommendation Develop a way of monitoring any technology investments based upon the ongoing benefit they provide and their ability to effectively mitigate risk over the long-term.</p> <p>Finding #18 There is presently no audit programme in place for IT suppliers, which allows the business to consider the extent of any cyber risks inherent in these third parties (or otherwise that tests the effectiveness of cyber controls that they perform for themselves). Such an approach should be developed ensuring that it is sufficiently risk based and can be applied in different ways dependent upon the size/scale and general dependency on that supplier to support any critical processes. Where necessary, and for the most critical suppliers, this should include the use of site inspections.</p> <p>Recommendation Develop an audit programme for IT suppliers, including the use of on-site inspections.</p> <p>Finding #19 Although there is a test schedule in place to test individual components, supplemented by regular movements of systems which provides further informal testing – testing does not go beyond this. There is a risk that IT staff may be unfamiliar with sequencing and technical restoration instructions if they do not rehearse system recovery. For example, if multiple layers are affected by an incident it may require several applications, databases, middleware and network infrastructure to be restored just to have one system up and running. It is acknowledged that this can be challenging in an environment where systems need to function around the clock with little room for any down time.</p>	

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			<p>Recommendation Document the sequence of systems to be recovered following an outage / disaster ensuring that this is used / validated as part of the next IT systems recovery test.</p> <p>Finding #20 NWL have a formal classification programme in place albeit management recognise that it requires further work to embed this activity into the business. Until this work is complete, it could lead to a lack of effective data security controls, which could increase the likelihood of a data breach that results in reputational damage and / or a fine.</p> <p>Recommendation Agree the formal list of actions necessary to fully embed the data classification process into the business.</p> <p>Finding #21 A cyber test (“Exercise White Trojan”) was completed in 2016 as part of an exercise to learn more about the type of response and actions that would be required in these circumstances. This was to test NWL’s Emergency Management Manual and its response to a cyber-incident using both the Crisis Management Team (CMT) and Incident Management Team (IMT) based upon a pre-prepared scenario. The exercise was the first ‘Gold’ level cyber security exercise within the water sector and involved five locations including Durham, Teeside and Essex along with all of the directors, 18 senior managers, a variety of specialists (media, IT, water, etc.). Recognising this, there is no documented process to complete a more regular, ongoing test as well as ensure that the lessons learnt are used to inform improvements within the control environment reported to the Risk & Compliance Committee. We were advised that the expectation from management is that this should be completed in the next 12 months.</p> <p>Recommendation Develop a timetable for completing an annual cyber test ensuring that the results and lessons learnt are reported to the Risk & Compliance Committee. This should include ensuring that any control weaknesses / improvements are reflected NWL’s Corporate Risk Register.</p> <p>Finding #22 The PR19 Business Case for Enhanced Cyber Resilience was noted as being very detailed in terms of describing the risks associated with a cyber-attack. However, the reference to any risks associated with the delivery of the enhancements was less detailed. This should be addressed so that the cyber improvements are subject to the same type of analysis as other types of risk.</p> <p>Recommendation Ensure all business cases, including the Business Case for Enhanced Cyber Resilience, document the risks associated with delivering the proposed changes.</p>	
		13. Innovation & new technology	<p>Finding #23 The business plan talks about a goal to be "leading in innovation within the utilities sector and beyond". The resilience framework also emphasises the focus on innovation yet this at a corporate level the key areas of risk considered by the Risk & Compliance Committee and Audit Committee do not talk about innovation. By innovating as a company, the business is consciously taking innovation risks, which whilst present opportunities also present risks in terms of the fact that any invested time, effort and resource results in failure. It would be beneficial therefore for the Board to define the extent of any innovation risks it wishes for the organisation to take. This should be</p>	

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			incorporated as part of the wider work on risk appetite. See also finding #2. Recommendation Ensure that the above work on risk appetite (mentioned in finding #2) is expanded to include Board's appetite for taking innovation risk.	
		14. Intelligent Asset Management	Finding #24 The business case for Smart Meters identifies a number of risks and uncertainties. However, these risks are not quantified. Equally, there is no evidence of robust, objective and quantitative assessment and there is no mention of transfer of risk through delivery phases of the project. These points should be addressed, a point that is particularly in relation to business cases that involve new technology where there might be either new or additional risks, which the business may be less familiar with taking on or managing. Recommendation Update the business case based upon the points mentioned above.	
	NWL's people are talented, committed & inspired to deliver great service to NWL's customers	15. Providing a healthy & safe place to work	No issues to raise.	
		16. NWL's people acting in line with NWL's values	No issues to raise.	
		17. Providing a great place to work		
	We work in partnership towards common goals	18. Integrated drainage Partnerships	Finding #25 The process for monitoring the success and general performance of partnerships, particularly those that are not directly owned by NWL would benefit from having tighter governance controls in place. There is an opportunity to improve the governance arrangements surrounding these relationships so that any risks or issues identified can be escalated to management to allow them to be appropriately actioned. This is important under PR19 as NWL become more reliant on these partnerships to ensure its own success; therefore, the greater the risk this generates in terms of needing to ensure the partnerships are both carefully selected and the relationships well managed. Recommendation Review the current governance arrangements with regards to providing oversight for the performance and management of partnerships so that the status of these relationships (both positive and areas for improvement) can be shared.	
		19. Co-Creation with NWL's partners	No issues to raise.	
		20. Resilient Supply chain	No issues to raise.	
		21. Integrated catchment partnerships	No issues to raise.	
	We are proud to contribute to local communities and their success	22. Building successful & resilient economies & regions	No issues to raise.	

Appendix A – Analysis of NWL's resilience activity compared to Ofwat PR19 Methodology

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
5. Securing long-term resilience	<p>"Companies need to address the challenges to resilience from climate change and population growth, such as pressures on surface water drainage and drought resilience."</p> <p>"Companies need to consider not only steps that improve their ability to withstand those pressures, but also steps that improve their response to and recovery from any resulting service disruption."</p>	<ul style="list-style-type: none"> - NWL have developed a Resilience Framework that sets out the core principles of what resilience looks like across the organisation. This was recently shared as part of a series of the Water Forums (customer challenge groups) who said that, "We like the resilience framework as a way of demonstrating how the different aspects of its business and future plans combine to deliver resilience in the round". This document was also favourably received by Ofwat when presented to them. The Resilience Framework references the significance of climate change as one of the primary challenges NWL faces. - The business plan says that NWL's aim is to increase the financial resilience of around one in five of the poorest households between now and 2030 with the target of eradication of water poverty. - Alongside climate change, population growth is identified as one of the key challenges that NWL must prepare for to ensure an effective and resilient service can be provided in future. - By 2020, NWL will have addressed the risks from climate change at operational sites deemed most vulnerable to river or coastal flooding (in line with the recommendations made in Royal Haskoning (DHV's Climate Change Asset Impact, 2012 Update Report). - The business plan cites the Water Rangers programme launched in 2014, a scheme of 62 volunteers who monitor routes across North East England that are prone to pollution. - A series of methodologies for wastewater have been developed to identify sewage treatment works, sewage pumping stations and areas of the sewerage network that are likely to require investment as a result of growth. - Global warming is included on the corporate risk register, a document which is subject to review and oversight from the Risk & Compliance and Audit Committees. - Smart meters will enable faster reductions to consumption and leakage. 24/7 monitoring will allow NWL to do much more to deliver unrivalled customer service, influence customer behaviour to reduce consumption and tackle leakage through enhanced network monitoring capabilities.
5.2 Why resilience is important	<p>"Water companies have a duty to maintain a water supply system and provide a wastewater system, so that they continue to meet their statutory security of supply and service obligations. These are legal obligations, which water companies must fulfil and their business plans at this and previous price reviews must take account of these obligations. "We allow companies to recover efficient costs through regulated revenues. But if a company subsequently finds itself having to spend more than this in order to fulfil these obligations, the company must do that with additional funds from investors as necessary."</p> <p>"Our studies highlights several issues of concern to Ofwat for companies regarding the measurement of asset health and how this contributes to their</p>	<ul style="list-style-type: none"> - As part of the business plan, NWL have developed a series of methodologies for wastewater to identify sewage treatment works, sewage pumping stations and areas of the sewerage network that are likely to require investment as a result of growth. These include: - Making sure that 24 most critical, above ground wastewater assets are protected to Water UK Security Standards in line with NWL's obligations under the Security and Emergency Measures Directive (SEMD). - Further improving security at all 128 enhanced service reservoirs. - Improving water tankering capabilities by increasing fleet size and the number of filling points across the regions. - Increasing static tank capacity by 53% above expected 2020 capability which will enable NWL to provide alternative water supplies to more than 100,000 customers in the event of an emergency. <ul style="list-style-type: none"> - Key Performance Indicators (KPIs) are available down to an Asset Level - IAM (Internal Asset Management Project) is currently underway. This considers whole of the asset base and gets the systems and process aligned nationally, to show what risks the asset present and get a wider understanding through data. - Consultation on strengths, risks, and weaknesses in 2016 highlighted specific areas of risk, including data protection/security, leakage

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
	<p>wider approach to resilience. This include how their Boards focus on engaging effectively with customers; driving greater innovation; ensuring a long-term mind-set; and developing a stronger understanding of how asset health affects service, especially for high impact, low probability events. We expect companies to have identified and, if necessary, addressed any existing issues in the current price control period. Their business plans for PR19 should not seek funding from customers to address any shortcomings of the past."</p> <p>"We want companies to carefully identify risks to their resilience and consider a full range of measures to manage these risks over the long term. Companies should engage and work with customers on their approach to resilience, and be innovative in how they manage and address risks to resilience. We want companies to focus on the long term, as well as the next five years. This will help secure better value for customers. Companies should also exploit opportunities to collaborate with partners and other water companies, and to better integrate water and wastewater resources."</p>	<p>(including water conservation), and resilience. These were added to the assurance plan last year and have been kept in the Assurance Plan for 2018/19.</p> <ul style="list-style-type: none"> - Smart meters will enable faster reductions to consumption and leakage. 24/7 monitoring will enable us to do much more to deliver unrivalled customer service, influence customer behaviour to reduce consumption and tackle leakage through enhanced network monitoring capabilities. <ul style="list-style-type: none"> - Catchment management partnerships are in place and continue to be developed in order to improve the region and ensure this meets customer expectations. Examples of this include working with local authorities to develop the look and feel of beaches and river locations, which customers have told NWL that they feel are priority areas in terms of the facilities and cleanliness of the locations. - Workforce 2025 and Great Place to Work Strategy are aiming to both the people and culture at NWL are fit for purpose and are able to support a resilient approach to management. - Extraordinary leadership: keep a workforce which represents NWL's customers and greater customer participation. - Great Place to Work: activities in place include team manager development programme and leadership training to ensure employees keep delivering good service to customer. Also aims to be in the top 25 Best Companies List 2019. - Strategic Workforce Planning: This aims to predict future skills & knowledge and engage in educational initiatives in order to have free drinking water for all school children by 2030 and zero water poverty. There are also ongoing opportunities to engage and develop skills and knowledge. - NWL Academy: Aim is to improve training and development through apprenticeships and graduate programmes. This will help inspire talent and enable NWL to develop the skills and capabilities they need now and in the future. - Excellent Competence: Plans to deliver mandatory training in order for employees to gain new skills and embrace and drive change. Employees will also be encouraged to improve resilience by sharing knowledge with each other in attempt to deliver unrivalled customer service. - Future-ready Mind-set: support people so they can quickly adapt to opportunities and innovations in technology. NWL will do so through embedding new skills into competence frameworks (and activities to assess availability of skills) and create a more strategic recruitment process. - Culture: improvements on the work culture include supporting employees in a way to become more resilient and to manage a good work life balance, improve communications between teams and have a 'one team' approach so that managers take can also take the time to speak to their teams.
5.3 How we see resilience	<p>"The Cabinet Office stated that the resilience of critical infrastructure and essential services could be secured through four key strategic components, also known as the 4R's.</p> <ul style="list-style-type: none"> - Resistance: preventing damage or disruption by providing the strength or protection to resist the hazard or its primary impact. - Reliability: ensuring that the infrastructure components are inherently designed to operate under a range of conditions, and hence mitigate damage or loss from an event. - Redundancy: this is concerned with the 	<p>Resilience approach is centred on addressing the four key strategic components of resilience set out by the Cabinet Office.</p> <p>Resistance:</p> <ul style="list-style-type: none"> - NWL are aiming to be the first water company to attain accreditation of the ISO Business Continuity standard in 2018. - An Incident Management Exercise was conducted on June 2017 where the Emergency Management manual was tested. - A scenario analysis exercise has been completed with respect to a potential cyber event. The exercise involved a number of directors and senior managers and was used to help identify any potential learnings. - Training staff to ensure they are constantly keeping safe is seen as NWL's priority. NWL using Water Rangers (volunteers from customers) who would rotate in shifts to monitor for pollution incidents. - NWL believe that one of the lessons learned from the Beast of the East was how essential technology is in situations like these. NWL uses Skype on a regular basis to keep contact with each of the 3 widely dispersed sites they have in the UK. This was also helpful when reaching out to senior managers who had restricted access from their homes and meant events could easily be managed without their physical presence.

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	<p>design and capacity of the network or system. The availability of backup installations or spare capacity will enable operations to be switched or diverted to alternative parts of the network in the event of disruptions to ensure continuity of services.</p> <p>- Response and recovery: enabling a fast and effective response to, and recovery from, disruptive events. The effectiveness of this element is determined by the thoroughness of efforts to plan, prepare and exercise in advance of events. These components of resilience need to be considered across all aspects of an organisation. This means having the right skills, the right leadership and the right systems, as well as having a robust infrastructure."</p>	<p>Reliability:</p> <ul style="list-style-type: none"> - The OFWAT "Beast of the East" report concluded that NWL were to understand how working closely with emergency services was crucial during this time and maintaining good relationships with those services in the future. Having good people at every level who have a lot of experience and feel empowered to make decisions. This included providing faster response and resolution to supply interruptions and keep customers aware through regular communication and via social media updates. NWL carefully analysed relevant factors which caused difficulties in order to attack the issue as efficiently as possible. They had also previously prepared for events like these by testing different processes, an area of work that started following the Winter of 2010/11. - NWL understands the importance of planning and pre-planning to help facilitate a situation as such. This planning encompasses both people planning and asset planning. - Better specialist support which will provide early interventions and active absence management that support wellness and recovery. - Current contingency plans allow for up to 40,000 homes to be recovered based upon a 2-4 day period with there being no supply. This will increase to 75,000 homes as part of PR19. - Periodic Work Area Recovery (WAR) tests are performed. These typically involve moving 10-20 people to another site to test whether they can perform critical processes / activities. All key sites have been assessed for capacity. WAR are not completed in a live environment albeit this is typical of many industries. <p>Redundancy:</p> <ul style="list-style-type: none"> - Dual data centres are in place with fibre links running between the two locations - Homeworking can be adopted for many staff, particularly those that work in office locations. The only exception to this noted was for the processing of card payments, which cannot be processed remotely. - Resilient and robust physical network. NWL has spent a number of years ensuring their systems are integrated but also have a degree of flexibility for re-zoning staff and systems. <p>Response and Recovery:</p> <p>Detailed Emergency management manual is in place, which outlines in detail the necessary procedures to:</p> <ul style="list-style-type: none"> - Recognise the escalation of a risk to a point where it is likely to materialise and take appropriate steps to mitigate its impact; - Effectively manage all operational events and facilitate a controlled return to normal operations as soon as possible; - Ensure compliance with legislative and regulatory requirements despite difficult circumstances; - Ensure a process of continual improvement; and - Ensure the business adopts a culture of "prudent overreaction" to an emergency <p>In addition:</p> <ul style="list-style-type: none"> - 32 departments across the business have varying types of department Business Continuity Plans, subject to their role and type of service that they provide. - Business Continuity Coordinators are in place in each department to assist with the embedding of good practice across the organisation. - Each of the five major NWL sites has a physical site plan. These take into a range of situations explaining what should be done as a result of either a denial of access, loss of site, loss of staff, pandemic or utilities failure. - A separate Emergency Planning Manual details how the business should respond in the event of a crisis. This detailing the roles and responsibilities of senior individuals who would be accountable for managing the event. - A Business Impact Analysis (BIA) is maintained across the business at both a strategic and tactical level (and subject to annual review). This helps with identifying and prioritising critical processes in the event of a BC event. Process dependencies between departments are shared to ensure critical processes can be recovered effectively and efficiently (and remain resilient). The BIA is reviewed / challenged by the Risk & Compliance Committee on an annual basis to ensure it aligns to senior management risk appetite. <p>Cyber / fraud:</p> <ul style="list-style-type: none"> - Reliability - Introduced automated secure incident and event management system, SPLUNK - Invested in Dark Trace anomaly detection tool, which provides alerts to analysts and threat intelligence reports. - Completed business continuity test, which included a scenario of a cyber-attack event on the NWL website in order to test how the management team would handle it. - Invested in a new system (Egress) to send encrypted files.

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		<ul style="list-style-type: none"> - Third party, Atkins, were commissioned to do a gap analysis exercise on the OT network. They will provide a RAG assessment before the costings for any improvements / resilience related actions are considered. - Formal Cyber Security, Data Protection and Incident Management Manual and processes in place to ensure events can be managed effectively whilst also minimising any impact to the organisation. - Response and Recovery - A formalised incident management process is established and IS staff training is in place in regards to Service Management to ensure that all IS teams are aligned in their understanding of the Incident Management process adopted by NWL. - NWL attend the North East Fraud Forum in order to collaborate with groups in the region. - A 'system thinking' approach has been adopted for long term system operation and investment, developing long term strategic network plans (25 year horizon). - Also proposing to strengthen the response and recover capability for large loss of supply events in the future by increasing tankering and alternative water capacity. As this capability is improved, requirements to invest in resilience schemes to mitigate risks and consequences of service failure are expected to fall.
	<p>"Effective resilience requires companies to consider their systems as a whole, taking into account the relationship between different aspects of their business (as well as external factors).</p> <p>The delivery of the services on which customers depend is not only a function of operational resilience. For example, companies will not be able to invest for the long term, if they have insufficient financial resilience and may be tempted to cut corners. Similarly, companies will not be able to make effective decisions about the management of risk to services if they do not have the information, systems, process, governance and capability to enable them to do so."</p>	<ul style="list-style-type: none"> - There is a Resilience Framework in place to inform long term investment decisions in comparison to managing present risks. The framework demonstrates the interdependency of 22 separate business areas, encompassing operational, financial and corporate resilience. - Current strategies includes using intelligent secure networks, sophisticated software and data to make sure that NWL manages its resources in the most efficient way as well as enhancing cyber security to protect services and customer and employee data. - Long term investment planned in terms of 'Future-proofing' the workforce with vital skills and characteristics and developing new talent through NWL's Academy. Maintaining continuity of service and resilience through ensuring knowledge and expertise are fed back into the workforce when experts leave. - NWL aim to ensure sound, long-term financial resilience by having a strong, simple capital structure in place. Also underpinned by commitment to maintain robust investment grade credit ratings. - Procurement resilience - "NWL's strategy follows the Sustainable Procurement Task Force's Flexible Framework model" - The Water Forums (customer challenge groups) - "We like NWL's resilience framework as a way of demonstrating how the different aspects of its business and future plans combine to deliver resilience in the round. NWL note that it was also favourably received by Ofwat when presented to them." - NWL record risks in a Corporate Risk Register and publish the principal risks as part of NWL's Annual Performance Report and Financial Statements. This ensures that NWL are open and transparent with customers as to the risks NWL face and manage each day. - Assurance: Third party, PwC, appointed to carry out technical assurance over non-financial data. <p>Cyber</p> <ul style="list-style-type: none"> - Security is an integral part of information systems including segregation of duties, change control procedures and agreed testing and approval processes. - Information Security events and weaknesses are formally managed to allow timely corrective action to be taken. - Information is protected to an appropriate level, based upon the impact of its disclosure, modification or loss. - Risk and threat map are used by management to highlight future risks or areas of concern present in the external environment.
	<p>"Effective resilience also means not only considering the next five-year period, but looking well beyond that and considering resilience in the long term. If delivery of reliable services today increases the risk to service delivery in the future, the company is not securing long-term resilience."</p>	<ul style="list-style-type: none"> - Significant bill reductions are planned for customers from 2020 as a result of continued efficiency improvements and while still retaining appropriate financial resilience going forward. - 2025 workplace strategy has been developed - Strategic risks are overseen and monitored by the Risk & Compliance Committee
5.4 NWL's overall approach to resilience	<p>"Key elements of the PR19 methodology for resilience are set out below.</p> <ul style="list-style-type: none"> - Operational resilience: NWL's outcomes framework, with its performance commitments and financial and reputational incentives, encourages 	<ul style="list-style-type: none"> - Ensuring sound long-term financial resilience by having a strong, simple capital structure in place. Also underpinned by commitment to maintaining a robust investment grade credit ratings - NWL have aligned their approach to asset management to ISO 55001 – NWL are one of only a few water companies accredited to this international standard for asset management - NWL have therefore developed a series of methodologies for wastewater to identify sewage treatment works, sewage pumping stations and areas of sewerage network that are likely to require investment as a result of growth.

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	<p>companies' management teams to identify and mitigate risks to operational resilience. The framework ensures that companies address current and future resilience challenges through the following.</p> <ul style="list-style-type: none"> - Day-to-day performance commitments, such as an expectation of achieving forward-looking upper quartile performance for supply interruptions, sewer flooding and pollution incidents for all companies. We have set a challenge to companies of a 15% reduction in leakage over five years. - Asset health performance commitments: challenging companies on mains bursts, unplanned outage, sewer collapses and treatment works compliance. - Risk-based resilience metrics: introducing new forward-looking resilience common performance commitments for resilience to drought and flooding. - Longer-term performance commitments and planning: we are requiring companies to provide projections for their performance commitments beyond the price control period out to at least 2035 to support a longer-term focus." 	<ul style="list-style-type: none"> - KPIs are available at Asset Level - IAM – Internal Asset Management Project - Considers whole of the asset base and gets the systems and process aligned nationally, to show what risks the asset present and get a wider understanding through data - Procurement resilience - "NWL strategy follows the Sustainable Procurement Task Force's Flexible Framework model - Water environment Performance Commitment for PR19 - 'km water environment improvements delivered in partnership for the benefit of customers and communities'. - NWL's water environment enhancements include: "The cumulative length of accessible water environment to which improvements are delivered (the estimates of 750 km for NW and 188 km for ESW would essentially be the maximum possible figures." - Smart meters will enable faster reductions to consumption and leakage. 24/7 monitoring will enable us to do much more to deliver unrivalled customer service, influence customer behaviour to reduce consumption and tackle leakage through enhanced network monitoring capabilities. There will be greater value in customers having a smart meter whether or not they are on a measured bill. - A 'system thinking' approach has been adopted for long term system operation and investment, developing long term strategic network plans (25 year horizon).
	<p>"Financial resilience: We expect companies to provide evidence of their financial resilience. In making this assessment, we expect companies to take into account the overall assessment of the risks that the company faces. This includes risks relating to their actual capital structure and financing arrangements as well as the impact of potential cost shocks arising from, for example, underperformance against their plans or from additional financial liabilities which are not funded by customers. In confirming that they are financially resilient, companies will need to be open and transparent about their ownership and financial structures. And we are asking companies to provide specific Board assurance on their notional and actual financeability."</p>	<ul style="list-style-type: none"> - Financial plans have been stressed tested for numerous future scenarios i.e. low inflation, increased interest rates, increase tax charges, failure to deliver TOTEX efficiency, increase in pension scheme deficit, lower expected returns at next price review (as well as a combination of these). - Stress testing for financial resilience adheres to OFWAT minimum standards. There are only 1 or 2 exceptions to this. Where an exception applies and NW believe the scenario is not relevant to them the scenario is still considered before a more suitable scenario is agreed. All exceptions are approved by the Board. - The company's Medium Term Plan (MTP) has been stress-tested under a number of reasonable, plausible and severe scenarios. The scenarios were selected by the Board after considering the principal risk and uncertainties facing the company, and the key economic and financial variables that could impact on the MTP. The combined impact of multiple scenarios has also been tested. - Stress tests and their outputs are approved by the Board in order to ensure adequate review from senior leadership across the business. - KPMG appointed to provide third party assurance over completion of stress tests and their outputs. - APR (Annual Performance Report) provides visibility to potential stress events up until 2025 (next 7 years) - Business Plan is forward looking in its approach in that it will require the business to "do things differently" from what it does today. This include building a culture of innovation amongst staff. - Business enhancements / improvements are reviewed the Board to ensure that they represent value for money to customers. - NWL aim to ensure sound, long-term financial resilience by having a strong, simple capital structure in place. Also underpinned by commitment to maintaining a robust investment grade credit ratings - Annual report / financial statements, regulatory accounting statements and additional regulatory information all feature as part of 2018/19 Assurance Plan.

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	<p>"Corporate resilience: we expect companies' plans to demonstrate that they have the necessary capability, systems and processes. Alongside operational and financial resilience, this is essential for an effective plan which will deliver resilience."</p>	<ul style="list-style-type: none"> - Corporate risk register comprised of wide range of corporate and operational risks over a 12 month horizon. Risks comprise of a range of common thematic and individual risks. Risks are scored using a standard risk methodology. - Each department is assigned a Risk Champion who is responsible for ensuring new and/or changes to existing risk and reported upwards into the Risk & Audit team. This includes the reporting of any issues or events that might denote where something has done wrong or a process has failed. - The top 20 risks are reported to the Executive Leadership Team (ELT) three times a year. - The role of the Risk & Compliance Committee is to consider the identification and assessment of risks whereas the Audit Committee consider the level and type of assurance that is provided against these areas. - Risks as part of HILL (High Impact Low Likelihood) report are considered as part of a heat map. Risk & Compliance receive these reports - Deep dives are completed risk owners on a periodic basis
<p>5-5 Resilience planning principles</p>	<p>Principle 1: Considering resilience in the round for the long term "The assessment of resilience should show a systematic and integrated understanding of service and systems risk across the entire business. Companies should assess resilience of their systems, and the services they provide, in the round. They should show a clear understanding of the interdependencies across operational, financial and corporate aspects of their business. This assessment should consider short, medium and long-term risks."</p>	<ul style="list-style-type: none"> - Completion of a deep-dive exercise in relation to 'resilience in the round' to gain a deeper understanding of this area - NWL's Resilience Framework covers 'resilience in the round' and sets out NWL's progress in developing long term plans as well as their engagement with customers. - Procurement resilience - "NWL's strategy follows the Sustainable Procurement Task Force's Flexible Framework model" - The Water Forums - "We like NWL's resilience framework as a way of demonstrating how the different aspects of its business and future plans combine to deliver resilience in the round. NWL note that it was also favourably received by Ofwat when presented to them." - NWL have developed a Resilience Framework, an effective way to show the interdependency and complexity of a number of NWL's business systems. - NWL record these risks in NWL's Corporate Risk Register and publish the principal risks as part of NWL's Annual Performance Report and Financial Statements. This ensures that NWL are open and transparent with customers as to the risks NWL manages. <p>Business Continuity</p> <ul style="list-style-type: none"> - An ongoing programme of assurance, led by the Business Continuity Manager, is due to commence to ensure departments and operational areas are maintaining their continuity plans to the expected standard. - HSEQ department ensure the business operate within any required ISO standards / specifications e.g. ISO 9001, ISO 14001, OHSAS 18001 and ISO 55001. - Business Continuity is also subject to periodic review by Internal Audit. - Business Continuity Manager is in place as well as separate managers for personnel, cyber and IT security. The group meet several times a year to consider opportunities for improvements and current business priorities. - A Business Continuity Steering Group is chaired by the Asset and Assurance Director and several other directors. The Group provides oversight for all business continuity activities in the business. <p>Finance</p> <ul style="list-style-type: none"> - Stress testing for financial resilience adheres to Ofwat minimum standards. There are only 1 or 2 exceptions to this. Where an exception applies and NW believe the scenario is not relevant to them the scenario is still considered before a more suitable scenario is agreed. All exceptions are approved by the Board. - Stress tests and their outputs are approved by the Board in order to ensure adequate review from senior leadership across the business. - KPMG appointed to provide third party assurance over completion of stress tests and their outputs. - APR (Annual Performance Report) provides visibility to potential stress events up until 2025 (next 7 years) - All assumptions applied in the Business Plan are approved by the PR19 Sub-Group and the Board. - Approach to innovation strikes a balance between both known and unknown activities (and is designed to be stretching). - Business Plan is forward looking in its approach in that it will require the business to "do things differently" from what it does today. This include building a culture of innovation amongst staff. - Business enhancements / improvements are reviewed the Board to ensure that they represent value for money to customers. -For natural and manmade hazard risks, sites were selected that, following all mitigation options, loss of that site would exceed NWL's current respond and recover capabilities. Risks were prioritised at these sites following the methodology developed by Arcadis [1] and recognised by Ofwat as an example of good practice. Arcadis have supported NWL in developing the approach to undertake site risk assessments and develop a base and future resilience metric to measure improvements in resilience at sites for specific hazards.

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	<p>Principle 2: A naturally resilient water sector "Resilient ecosystems and biodiversity underpin many of the key services provided by companies. Promoting ecosystem resilience and biodiversity is a key part of the decision-making process for ensuring resilient services."</p>	<ul style="list-style-type: none"> - NWL have undertaken a deep-dive of water resource, wastage treatment and quality to gain a deeper understanding in response to scrutiny of this area - Other customer research carried out on behalf of NWL indicates that customers generally support NWL's aspirations. Focus group research (Explain, 2014) found that most participants (87%) agreed with NWL going above and beyond government requirements and spending more of customers' money on protecting wildlife and habitats. Recent workshop (Explain, 2017) indicated that participants expect NWL to be speaking to and working with the Environment Agency and other environmental organisations on environmental issues. Therefore, the scope of the WINEP is in keeping with customer's expectations.
	<p>Principle 3: Customer engagement "Aspirations on levels of resilience should be informed by engagement with customers, to help companies understand their customers' expectations on levels of service."</p>	<ul style="list-style-type: none"> - The first of several resilience engagement projects was to understand customers' views on and understanding of resilience - Customers have been provided with opportunities to shape the longer-term issues, including through the service valuation tool, where they were given the chance to see the effect, on their own bill, of their choices about the proposed long-term investments and enhancements. - Risk Appetite Statements have been defined by the Risk & Compliance Committee and laid out in terms of separate thresholds (low, medium, and high). - Customer Challenge Group (CCG) - Water Forums challenge and provide independent assurance to Ofwat on the quality of customer engagement. - NWL have spoken to customers directly and indirectly through a number of independently led research and co-creation workshops to agree how customers' views should shape the approach to metering. - NWL have identified that their customers are broadly in favour of smart metering and 62%/64% (NW/ESW) said they would be willing to pay for it. - Customer research was arranged in April 2018. Explain, a market research consultancy were commissioned for the research. Research sessions were held in Newcastle, Durham and Chelmsford with a total of 1298 customers in attendance. Customers were taken through each of the options including the associated impact to bills and asked to vote on their acceptance. Overall acceptability for the lead package was 70% & 82% (NW) 85% (ESW) indicating customer support. Some questions were raised at the sessions over the impacts of phosphate dosing on health and the environment. As a future strategy customers' preferred option is to replace lead pipework. - Other customer research carried out on behalf of NWL indicates that customers generally support NWL's aspirations. Focus group research (Explain, 2014) found that most participants (87%) agreed with NWL going above and beyond government requirements and spending more of customer's money on protecting wildlife and habitats. Recent workshop (Explain, 2017) indicated that participants expect NWL to be speaking to and working with the Environment Agency and other environmental organisations on environmental issues. Therefore, the scope of the WINEP is in keeping with customer's expectations. - Extensive customer research has been undertaken, with outcomes sifted and prioritised. The basis for this 'sorting activity' is identified as being customer-led. - NWL have tested their wastewater resilience projects with customers via multiple engagement forums such as the NWL Innovation festival, PR19 Wastewater Design Sprint, Thinking Ahead workshops and others. The scores and feedback have been taken into consideration within the final plan.
	<p>Principle 4: Broad consideration of intervention options "Companies' plans to manage resilience should consider a full set of mitigating actions and interventions that consider all of the components of resilience, including response and recovery. They should also explicitly consider options that involve cooperation and collaboration with other companies at a regional or even national level (where they offer best value)."</p>	<ul style="list-style-type: none"> - Business Continuity Manager is in place as well as separate managers for personnel, cyber and IT security. The group meet several times a year to consider opportunities for improvements and current business priorities. - A Business Continuity Steering Group is chaired by the Asset and Assurance Director and several other directors. The Group provides oversight for all business continuity activities in the business. - 32 departments across the business have varying types of department Business Continuity Plans, subject to their role and type of service that they provide. - Business Continuity Coordinators are in place in each department to assist with the embedding of good practice across the organisation. - Each of the five major NWL sites has a physical site plan. These take into account a range of situations explaining what should be done as a result of either a denial of access, loss of site, loss of staff, pandemic or utilities failure. - A separate Emergency Planning Manual details how the business should respond in the event of a crisis. This detailing the roles and responsibilities of senior individuals who would be accountable for managing the event. - A Business Impact Analysis (BIA) is maintained across the business at both a strategic and tactical level (and subject to annual review). This helps with identifying and prioritising critical processes in the event of a BC event. Process dependencies between departments are shared to ensure critical processes can be recovered effectively and efficiently (and remain resilient). The BIA is

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		<p>reviewed / challenged by the Risk & Compliance Committee on an annual basis to ensure it aligns to senior management risk appetite.</p> <ul style="list-style-type: none"> - Current contingency plans allow for up to 40,000 homes to be recovered based upon a 2-4 day period with there being no supply. This will increase to 75,000 homes as part of PR19. - Periodic Work Area Recovery (WAR) tests are performed. These typically involve moving 10-20 people to another site to test whether they can perform critical processes / activities. All key sites have been assessed for capacity. WAR are not completed in a live environment albeit this is typical of many industries. - A scenario analysis exercise has been completed with respect to a potential cyber event. The exercise involved a number of directors and senior managers and was used to help identify any potential learnings. - Single Points of Failure (SPoFs) have been considered based upon process or people weaknesses. In some instances, these have been accepted where they have been deemed a manageable risk. Where the involvement of any suppliers have highlighted any SPoFs, actions have been taken to develop the internal capabilities of staff to improve business resilience in this area. - Supplies of water and electricity are monitored based upon seasonal use/demand to ensure peak periods are managed appropriately and that resource can be made available should there an outage occur. - An ongoing programme of assurance, led by the Business Continuity Manager, is due to commence to ensure departments and operational areas are maintaining their continuity plans to the expected standard. - HSEQ department ensure the business operate within any required ISO standards / specifications. Business Continuity is also subject to periodic review by Internal Audit.
	<p>Principle 5: Delivering best value solutions for customers "Companies' plans to manage resilience should consider the best value solutions for customers in the long term, which may involve long-run solutions."</p>	<ul style="list-style-type: none"> - See reference to customer engagement programme mentioned elsewhere. - NWL have spoken to customers directly and indirectly through a number of independently led research and co-creation workshops to agree how customers' views should shape the approach to metering. - NWL have also identified that their customers are broadly in favour of smart metering and 62%/64% (NW/ESW) said they would be willing to pay for it.
	<p>Principle 6: Outcomes and customer-focused approach "Companies' plans to manage resilience should inform the outcomes they propose. The proposed outcomes on resilience, and the associated stretching performance commitments they set, should also take into account future risks and customer preferences."</p>	<p>NWL customers have told them through customer engagement that dealing with interruptions to supply is a top service priority. (Service Improvements, 2014). This has resulted in stretching targets being incorporated into the business plan to make sure that they are industry leaders in responding to interruptions if and when they do happen.</p> <p>Associated stretching performance commitments: "Through our bathing waters and river water quality research, conducted in 2016, we understand that customer satisfaction in relation to the water environment could be increased by addressing issues that are wider than the quality of the water itself. For example, factors relating to the environment such as litter, facilities, ease of access and improved wildlife habitats."</p> <ul style="list-style-type: none"> - NWL have spoken to customers directly and indirectly through a number of independently led research and co-creation workshops to agree how customers' views should shape the approach to metering. - Other customer research carried out on behalf of NWL indicates that customers generally support NWL's aspirations. Focus group research (Explain, 2014) found that most participants (87%) agreed with NWL going above and beyond government requirements and spending more of customer's money on protecting wildlife and habitats. Recent workshop (Explain, 2017) indicated that participants expect NWL to be speaking to and working with the Environment Agency and other environmental organisations on environmental issues. Therefore, the scope of the WINEP is in keeping with customer's expectations. - This enhancement will contribute towards the 'We help to improve the quality of rivers and coastal waters for the benefit of people, the environment and wildlife' business outcome.

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
	<p>Principle 7: Board assurance and sign-off</p> <p>"Companies' Boards will need to assure us that companies' business plans have been informed by:</p> <ul style="list-style-type: none"> - A robust and systematic assessment of the resilience of the company's systems and services; - Customer views on managing resilience; and - Comprehensive and objective assessment of interventions to manage resilience in customers' long-term interests." 	<ul style="list-style-type: none"> - A resilience framework has been developed that details the approach to managing 'resilience in the round'. This framework will be subject to a separate review by NWL's own Internal Audit Team (detailed on the 2018/19 Assurance Plan). - The Price Review Programme Board (PRPB) is in place to manage the development and delivery of the regulatory price review submission (PR19). This Senior Manager forum is part of a wider governance framework that tracks programme delivery from the working-level up to Board level. - The PRPB is responsible for managing the strategic alignment of the business planning process ensuring requirements from the Price Review Steering Group (PRSG) are effectively woven into the plans in addition to escalating issues, risks and strategic decisions up to the PRSG.
5.6 Initial assessment of business plans – resilience	<p>Organisations should be able to answer:</p> <p>1. How well has the company used the best available evidence to objectively assess and prioritise the diverse range of risks and consequences of disruptions to its systems and services, and engaged effectively with customers on its assessment of these risks and consequences?</p> <p>2. How well has the company objectively assessed the full range of mitigation options and selected the solutions that represent the best value for money over the long term, and have support from customers?</p>	<ul style="list-style-type: none"> - Numerous deep dives performed on various areas of resilience in order to have complete set of evidence to make decisions - Risk & Compliance Committee regularly review current and emerging risks and challenge thinking with regards to management of business systems, critical assets and operational processes. - Risks are recorded in the Corporate Risk Register and publish the principal risks as part of an Annual Performance Report and Financial Statements. This ensures that NWL are open and transparent with customers as to the risks they face and manage each day. - Heat maps are used as part of standard risk reporting at the Risk & Compliance Committee to help manage risks and if any risks are in 'red zone' scores, ELT need to mitigate if they are over 10. <ul style="list-style-type: none"> - Business enhancements / improvements are reviewed the Board to ensure that they represent value for money to customers. A detailed ToR document is in place outlining the roles & responsibilities of the PRPB and PRSG as well as the purpose of the meetings, which include: <ul style="list-style-type: none"> - Provide strategic direction to the PRPB and PRWG Leads - Review escalations and agree next steps - Review top Risks, Issues and Opportunities - Agree any, issues, risks or escalations for the Board PR19 sub group - Review, update and challenge progress on the risk mitigation plans - Remove potential blockers - Review progress against plan - Customer research was arranged in April 2018. Explain, a market research consultancy were commissioned for the research. Research sessions were held in Newcastle, Durham and Chelmsford with a total of 1298 customers in attendance. Customers were taken through each of the options including the associated impact to bills and asked to vote on their acceptance. Overall acceptability for the lead package was 70% & 82% (NW) 85% (ESW) indicating customer support. Some questions were raised at the sessions over the impacts of phosphate dosing on health and the environment. As a future strategy customers' preferred option is to replace lead pipework. - For natural and manmade hazard risks, sites were selected that, following all mitigation options, loss of that site would exceed NWL's current respond and recover capabilities. Risks were prioritised at these sites following the methodology developed by Arcadis [1] and recognised by Ofwat as an example of good practice. Arcadis have supported NWL in developing the approach to undertake site risk assessments and develop a base and future resilience metric to measure improvements in resilience at sites for specific hazards. - From these assessments a prioritised programme of work based on risk and likelihood has been developed, which aims to deliver the maximum benefit based on cost.
5.7 Initial assessment of business plans test 1: evidence to	"Business appraisals of operational, financial and corporate resilience should include a robust, objective, comprehensive and quantitative assessment of the principal risks they see	<ul style="list-style-type: none"> - Strategic risks that are emerging are considered at corporate and are subject to review by the Risk & Compliance Committee. - All risks are assessed based upon a standard risk scorecard in terms of their impact and probability and by assigning them an inherent and residual risk score. Risks that are scored above a certain value are deemed to be outside of the Board's risk appetite. - NWL are continuing to work closely with a range of partners, including other utility providers and Local Resilience Forums, to contribute to the creation of more resilient communities and will extend NWL's work with environmental stakeholders in developing

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<p>assess and prioritise the range of risks to resilience</p>	<p>to the resilience and delivery of the services on which their customers depend, over the next five years and over the longer term. This must include the consideration of possible failure points across the organisation (and through the supply chains). This should include: - The risks of a failure occurring in each area; - The impact on customers if that risk transpires; and - The extent to which this risk has already been mitigated.</p>	<p>resilient ecosystems. - Customer research was arranged in April 2018. Explain, a market research consultancy were commissioned for the research. Research sessions were held in Newcastle, Durham and Chelmsford with a total of 1298 customers in attendance. Customers were taken through each of the options including the associated impact to bills and asked to vote on their acceptance. Overall acceptability for the lead package was 70% & 82% (NW) 85% (ESW) indicating customer support. Some questions were raised at the sessions over the impacts of phosphate dosing on health and the environment. As a future strategy customers' preferred option is to replace lead pipework. - Relating to enhancements, the majority of business cases a base-case (do-nothing) has been identified and a range of differing intervention options identified. Options have been costed. - Delivery options have been considered (in-house / outsourcing) with commentary on cost and quality implications of each option. - NWL identify that risks to the business and services to customers are managed using a risk-based prioritisation approach including the corporate risk register. This is stated to be a well-established approach to identify and manage risk and NWL's approach to corporate governance and assurance of their business processes and data management was recently recognised by Ofwat as NWL moved to 'Self-assured' status for regulatory reporting obligations.</p>
	<p>"When looking at asset health and, in particular as highlighted by the targeted review of asset health, high impact, low probability events, companies need to consider how the health of their assets impacts services and how capital maintenance impacts asset health."</p>	<p>- Asset Health: NWL explored concept of what is fair for customers who decided that they preferred to have flat, stable and manageable bills over time. This preference is reflected in the bills profile within NWL's bills profile within the plan - Customers do not expect the business to remove all risks however they expect plans for the future through updates and modernisation of systems/infrastructure. - NWL have aligned approach to asset management to ISO 55001 – NWL are one of only a few water companies accredited to this international standard for asset management - Plans to reduce unplanned outage by 10% over 2020-2025. To do so, will monitor the performance of water treatment works closely. Also plans to make a further change in both interruptions and leakage performance - reduce burst rate to new level which matches top 25% of companies - Mains bursts: stretching target but committed to achieving industry upper quartile performance by 2025, and will reduce the number of bursts to a PC level of 2,952 in 2024-25. - Discoloured water contacts - already big improvements however NWL has plans to deliver a further 20% improvement (and thus reducing the number of contacts they receive to 2000 by 2025) - NWL are currently considering good practice in terms of measuring asset health (by working with the Institute of Asset Management) and other contacts in and outside of the water sector. NWL plan to have identified appropriate asset health measures and collected data by the end of the 2020-25 period</p>
	<p>"Companies should also explicitly consider their relationships with suppliers in the context of resilience."</p>	<p>- NWL has held a dedicated 'supplier workshop' in 2017 which have suppliers the opportunity to help shape areas of focus. - NWL engages with their suppliers at the highest level to agree KPIs for sustainability and to help those customers achieve them. - Processes are in place to ensure clear accountabilities, good governance and the flow of information between NWL's company and NWL's supply chain partners which supports NWL's corporate resilience. - Critical suppliers have been considered in terms of their business continuity arrangements. - Risk based questionnaires to third party suppliers. - Due Diligence is conducted on new IT suppliers to consider any cyber/IT related risks. - Pentest partners complete Penetration testing on key services/applications.</p>
	<p>"When considering financial resilience in their business plans, companies have to consider how their financial arrangements will ensure they can deliver resilient services even in the face of challenges. We expect companies to explain how the assumptions that underpin their plan relate to the forward-looking assumptions that underpin their long-term viability statements. Companies should set out the reasons for any changes in the assumptions made or</p>	<p>- Financial plans have been stress tested for numerous future scenarios i.e. low inflation, increased interest rates, increase tax charges, failure to deliver to text efficiency, deterioration in benefit pension scheme deficit, lower expected returns at next price review, as well as a combination of these. - Ensure sound, long-term financial resilience by having a strong, simple capital structure in place." Also underpinned by commitment to maintaining a robust investment grade credit ratings. - Ensures sound, long-term, financial resilience by having a strong, simple capital structure in place. This is also underpinned by the Board's commitment to maintaining robust investment grade credit ratings. - Monitor financial obligations over the long-term but also maintain a detailed 5 year plan which will be updated and signed off by the board annually. - Assess resilience within NWL's business, the Risk and Compliance committee regularly reviews current and emerging risks and challenges to their business systems, critical assets and operational processes - Publish information on 'Our Finances Explained' website and within specific publications on their ownership and financial structures</p>

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	scenarios considered by their Boards in reaching their conclusions on financial resilience."	<ul style="list-style-type: none"> - Stress testing for financial resilience adheres to OFWAT minimum standards. There are only 1 or 2 exceptions to this. Where an exception applies and NW believe the scenario is not relevant to them the scenario is still considered before a more suitable scenario is agreed. All exceptions are approved by the Board. - Stress tests and their outputs are approved by the Board in order to ensure adequate review from senior leadership across the business. - KPMG appointed to provide third party assurance over completion of stress tests and their outputs. - APR (Annual Performance Report) provides visibility to potential stress events up until 2025 (next 7 years) - All assumptions applied in the Business Plan are approved by the PR19 Sub-Group and the Board. - Approach to innovation strikes a balance between both known and unknown activities (and is designed to be stretching). - Business Plan is forward looking in its approach in that it will require the business to "do things differently" from what it does today. This include building a culture of innovation amongst staff. - Business enhancements / improvements are reviewed the Board to ensure that they represent value for money to customers.
5.8 Initial assessment of business plans test 2: mitigating and managing risk to provide the best value for money over the long term	"We will consider the extent to which the appraisals are supported by global best practice techniques, understand and appraise risk and uncertainty and the extent to which there is Board and third-party assurance."	<ul style="list-style-type: none"> - Continuing to lead on procurement best practice using the Flexible Framework. Aim is to remove any remaining barriers to sustainable procurement by engaging with and supporting our suppliers at the highest level to agree sustainability KPIs - Corporate Risks are assessed as part of formal risk register process, which then informs the assurance programme, based upon the profile of each of each risk. - NWL's record these risks in the Corporate Risk Register and publish the principal risks as part of an Annual Performance Report and Financial Statements. This ensures that NWL are open and transparent with customers as to the risks the business faces and manages each day. - Following NWL's appraisal of risk and current system resilience across their water service, they have identified a number of discretionary investment schemes which start to address this - Wide range of risks are subject to various forms of assurance in line with the Assurance Plan. Assurance is categorised in terms of it being either Mandatory, Priority, Targeted or Standard assurance. - An ongoing programme of assurance, led by the Business Continuity Manager, is due to commence to ensure departments and operational areas are maintaining their continuity plans to the expected standard. - HSEQ department ensure the business operate within any required ISO standards / specifications. Business Continuity is also subject to periodic review by Internal Audit. - Comprehensive introductory / context provided within the document to identify the 'strategic case' and alignment with national policy.
	"Companies should also have regard to the wider costs and benefits of the resilience of their services to the economy and society. The natural capital approach provides an opportunity for the value of ecosystems to be better incorporated within the evaluation of resilience and, where appropriate, could be incorporated into the assessment of the impact of company activities."	<ul style="list-style-type: none"> - Business enhancements / improvements are reviewed by the Board to ensure that they represent value for money to customers. - New approach to regional resilience include plans to appoint a Chief Resilience and Sustainability Officer who will have overall responsibility for evaluating and promoting the delivery of resilience in the round across the entire business encompassing assets, systems, people, natural capital and financial resilience. - NWL understand innovation will play a crucial part of how they will deliver an unrivalled, inclusive and affordable customer experience. Such innovation will allow them to help fix certain problems such as enhancing the beneficial impact they have on the environment and improving their Natural Capital. - NWL have a series of objectives they are working towards to help them achieve a goal to be leading in land management to enhance natural capital and deliver net gain for biodiversity in their regions (i.e. have the best beaches and rivers in the country and lead in the sustainable use of natural resources. In addition to this, NWL will show support for Defra's 25-year environmental plan. - Opportunities to enhance biodiversity through natural flood management (NFM) which uses nature-based solutions to hold back water on land. - Reducing waste and increasing the amount NWL reuses/recycles is central to good stewardship of their approach to protecting the environment. Three aspects make up this approach, one of which looks at the management of purchases so that (where practical) they use products incorporating high levels of recycled content.
	"As highlighted in NWL's 'resilience in the round' document, it will be important for companies to take a systems-based approach to their assessment of pressures and risks. The interconnectivity across systems, and the knock-on impacts from one system to another, will likely form an	<ul style="list-style-type: none"> - Business Continuity Manager is in place as well as separate managers for personnel, cyber and IT security. The group meet several times a year to consider opportunities for improvements and current business priorities. - A Business Continuity Steering Group is chaired by the Asset and Assurance Director and several other directors. The Group provides oversight for all business continuity activities in the business. - 32 departments across the business have varying types of department Business Continuity Plans, subject to their role and type of service that they provide. - Business Continuity Coordinators are in place in each department to assist with the embedding of good practice across the

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	<p>essential component of a company's assessment of prioritised risks to resilience of services. Resilience is different from simply managing risk exposure. It requires a much broader range of options, often systems based ones, which not only reduce risk, but enhance the ability to cope with, and recover from, pressures and shocks."</p>	<p>organisation.</p> <ul style="list-style-type: none"> - Each of the five major NWL sites has a physical site plan. These take into a range of situations explaining what should be done as a result of either a denial of access, loss of site, loss of staff, pandemic or utilities failure. - A separate Emergency Planning Manual details how the business should respond in the event of a crisis. This detailing the roles and responsibilities of senior individuals who would be accountable for managing the event. - A Business Impact Analysis (BIA) is maintained across the business at both a strategic and tactical level (and subject to annual review). This helps with identifying and prioritising critical processes in the event of a BC event. Process dependencies between departments are shared to ensure critical processes can be recovered effectively and efficiently (and remain resilient). The BIA is reviewed / challenged by the Risk & Compliance Committee on an annual basis to ensure it aligns to senior management risk appetite. - Current contingency plans allow for up to 40,000 homes to be recovered based upon a 2-4 day period with there being no supply. This will increase to 75,000 homes as part of future plans. - Periodic Work Area Recovery (WAR) tests are performed. These typically involve moving 10-20 people to another site to test whether they can perform critical processes / activities. All key sites have been assessed for capacity. WAR are not completed in a live environment albeit this is typical of many industries. - A scenario analysis exercise has been completed with respect to a potential cyber event. The exercise involved a number of directors and senior managers and was used to help identify any potential learnings. - Single Points of Failure (SPoFs) have been considered based upon process or people weaknesses. In some instances, these have been accepted where they have been deemed a manageable risk. Where the involvement of any suppliers have highlighted any SPoFs, actions have been taken to develop the internal capabilities of staff to improve business resilience in this area. - Supplies of water and electricity are monitored based upon seasonal use/demand to ensure peak periods are managed appropriately and that resource can be made available should there an outage occur. - An ongoing programme of assurance, led by the Business Continuity Manager, is due to commence to ensure departments and operational areas are maintaining their continuity plans to the expected standard. - HSEQ department ensure the business operate within any required ISO standards / specifications. Business Continuity is also subject to periodic review by Internal Audit.
	<p>"In assessing risks, we expect companies to take a long-term approach in the context of wider water and wastewater planning. Planning for clean water services, including statutory water resource management plans and drought plans, has a well-developed framework. This enables companies to assess pressures and risks objectively and effectively engage with customers."</p>	<ul style="list-style-type: none"> - Carried out long-term planning to secure sufficient water resources into the future (something that has been the company's long term position). -NWL have spoken to customers directly and indirectly through a number of independently led research and co-creation workshops to agree how customers' views should shape the approach to metering. -A 'system thinking' approach has been adopted for long term system operation and investment, developing long term strategic network plans (25 year horizon). -NWL's plans are supported by the use of both risk scoring and cost benefit analysis as and support meeting its long-term objectives in line with both governmental, regulatory and customers' expectations.
	<p>"For wastewater, we expect companies to base their assessment of risks to resilience on the principles of the drainage strategy framework. The drainage strategy framework should form the basis of wastewater planning in the short to long term."</p>	<ul style="list-style-type: none"> - A plan is in place to align a new long-term (25 years) water quality strategy to the strategic network planning process. - The proposals in NWL's business plan take account of their vision, and support other strategic documents including NGL's long-term water quality plan which explains NWL's contribution to the Water UK's 21st Century Drainage programme, the WT's long-term planning strategy, and Defra's 25-year environment plan. NWL have a basis for wastewater in the short and long-term.
	<p>"We will assess the extent to which customers are at the heart of the process, throughout. This includes the extent to which accurate and high quality comparative data has informed customers' choices and how these choices have been taken into account in companies' plans."</p>	<ul style="list-style-type: none"> - As part of customer engagement, customers helped NWL understand how to present risk and probability to them. As a result of this project, NWL's customers helped design their engagement around resilience, asset health and long-term affordability so that it was understandable to them. - Customers have had positive opportunities to shape the longer-term issues where they were given the chance to see the effect, on their own bill, of their choices about the proposed long term investments and enhancements. - NWL shared their history with customers so they could understand how the Group supported their local area - this was aimed to help demonstrate NWL's long term focus and investment for innovation and resilience are designed to their lasting legacy for current and future generations. - In developing the plan, carried out 4 specific phases of customer research on resilience between July 2016 and May 2018, through

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		<p>which customers indicated they would rather pay for a more resilient service. Customers also play a big part in supporting the investment in resilient networks and planning ahead for impacts (i.e. climate and population change).</p> <ul style="list-style-type: none"> - Operational resilience is all about delivering to current and future customers with a reliable and sufficient supply of good quality drinking water. - Ensured that all schemes they are including in their plan have strong support from customers, with acceptance scores between 67% and 100%. - Customers have told NWL dealing with interruptions to supply service is a top priority. Included stretching PCs within the plan to make sure that they are industry leaders in responding to interruptions if and when they do happen. - Focus has been on maintaining supplies to customers as the first priority over and above resolving the root cause of the interruption. - Customers expect NWL to invest in reliable and resilient infrastructure, and to have back up plans. NWL does this by investing appropriately in their assets and their people to meet set challenging targets. - Branch Out fund works in partnership to reconnect people and wildlife, It helps their regions build resilience and adapt to changing climate. - NWL have learnt from customer research that customers' enjoyment of the water environment is affected by factors outside NWL's control, but that they expect us to work with others to improve the environment, ideally in areas they are able to access. -NWL will provide customers with comparative billing information, showing them what their bill would be if they switched to a measured tariff, but they will retain the right to choose how they pay for their water for as long as they live at the property. - Business plan discusses customer choices and how they have been involved in the planning processes.
	<p>"We will assess whether companies have developed a business plan which will mitigate and manage risks to resilience in the round in a way that delivers best value now and in the long term.</p> <p>We expect companies to provide clear evidence that they have objectively considered the full range of resilience management options, with a view to providing the best value for customers over the long term. This includes:</p> <ul style="list-style-type: none"> - Infrastructure - such as treatment, network, storage and transfers; - Soft infrastructure - such as Eco services markets and catchment schemes; - Behaviours - for example from improving customer use of water; and - Response and recovery – for example from improving contingency planning." 	<ul style="list-style-type: none"> - A Business Continuity Steering Group is chaired by the Asset and Assurance Director and several other directors. The Group provides oversight for all business continuity activities in the business. - 32 departments across the business have varying types of department Business Continuity Plans, subject to their role and type of service that they provide. - Business Continuity Coordinators are in place in each department to assist with the embedding of good practice across the organisation. - Each of the five major NWL sites has a physical site plan. These take into a range of situations explaining what should be done as a result of either a denial of access, loss of site, loss of staff, pandemic or utilities failure. - A separate Emergency Planning Manual details how the business should respond in the event of a crisis. This detailing the roles and responsibilities of senior individuals who would be accountable for managing the event. - A Business Impact Analysis (BIA) is maintained across the business at both a strategic and tactical level (and subject to annual review). This helps with identifying and prioritising critical processes in the event of a BC event. Process dependencies between departments are shared to ensure critical processes can be recovered effectively and efficiently (and remain resilient). The BIA is reviewed / challenged by the Risk & Compliance Committee on an annual basis to ensure it aligns to senior management risk appetite. - Current contingency plans allow for up to 40,000 homes to be recovered based upon a 2-4 day period with there being no supply. This will increase to 75,000 homes as part of PR19. - Periodic Work Area Recovery (WAR) tests are performed. These typically involve moving 10-20 people to another site to test whether they can perform critical processes / activities. All key sites have been assessed for capacity. WAR are not completed in a live environment albeit this is typical of many industries. - A scenario analysis exercise has been completed with respect to a potential cyber event. The exercise involved a number of directors and senior managers and was used to help identify any potential learnings. - Appropriate mitigation measures in place at sites NWL's have assessed as being 'too critical to fail' - Financial plans have been stressed tested for numerous future scenarios i.e. low inflation, increased interest rates, increase tax charges, failure to deliver to text efficiency, deterioration in benefit pension scheme deficit, lower expected returns at next price review, as well as a combination of these - Single Points of Failure (SPoFs) have been considered based upon process or people weaknesses. In some instances, these have been accepted where they have been deemed a manageable risk. Where the involvement of any suppliers have highlighted any SPoFs, actions have been taken to develop the internal capabilities of staff to improve business resilience in this area. - Supplies of water and electricity are monitored based upon seasonal use/demand to ensure peak periods are managed appropriately and that resource can be made available should there an outage occur. - An ongoing programme of assurance, led by the Business Continuity Manager, is due to commence to ensure departments and operational areas are maintaining their continuity plans to the expected standard. - HSEQ department ensure the business operate within any required ISO standards / specifications. Business Continuity is also subject

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		<p>to periodic review by Internal Audit.</p> <p>As the industry leader for interruptions to supply since 2012. For 2020-25 will focus on reducing response time to interruptions by reviewing operational logistics. Also propose to improve data capture by building up the level of real-time pressure monitoring in the network. Objective is to reduce unplanned outage by 10% over 2020- 25. Aim to reduce burst rate to a new level which matches the upper quartile (top 25% of companies) industry level of mains bursts. This will include:</p> <ul style="list-style-type: none"> - Investment in managing water pressure across the networks - Tackling the cause and impact of as a result of sudden peaks in pressure 'pressure transients' that can accelerate main bursts. - Continuation of a proactive mains renewal programme. <p>Aim to do more to reduce the 'wastage' of drinking water in the forms of leakage and excessive water use by customers. This will contribute to maintaining reliable and resilient supplies for the long term and benefit the environment.</p> <ul style="list-style-type: none"> - Evidence that NWL have considered a number of 'costing options' with three key variables of meter technology, installation numbers and location considered. However, no extensive detailing of differing delivery options - e.g. 'do nothing' option not presented fully as a base-case, detail not provided on differing options for the roll-out / installation programme of smart meters. - Business case lacks any details regarding the nature of options considered or how they were appraised. - NWL have developed a business plan which will mitigate risk and resilience both now and in the long-term. Business plan covers infrastructure, soft-infrastructure, behaviours and response recovery. - NWL's business plan details their values for customers over the long term, discussing the launch of the 'Unrivalled Customer Experience' strategy in 2016. NWL ambition is to be recognised as a world class customer service provider. Section within in the business plan sets out how NWL are responding to customer expectations and the plans NWL have in place to deliver the 'Unrivalled Customer Experience' now and in the long-term. - Business plan discusses the ways NWL are aiming to measure customer behaviours and services in the following ways. 1). The customer measure of experience (C-MeX) 2). The developer service measure of experience (D-MeX). 3). Response time to complaints, all with the aim to improving customer value in the long-term. - Business plan discusses NWL catchment scheme (soft infrastructure), they have been involved in catchment management since 2007. NWL plan is to build on the catchment scheme and expand the scale of activity by working with catchment partnerships and delivering multiple benefits to the environment through catchment management.
	<p>"We also expect companies to take advantage of and work with natural processes, where appropriate, such as sustainable urban drainage systems (SuDs) and catchment management approaches, which can provide long-term, sustainable and best-value options in many situations.</p>	<ul style="list-style-type: none"> - Plans encompass not only own assets and services but take into account natural capital (that is, the natural assets such as soil, air, water and all living things). - As part of NWL's Integrated Approach, have consulted with internal stakeholders, held a series of catchment-level workshops for external partners, and developed a high level strategic approach to working with all partnerships in the environment captured in the Environmental Partnerships Strategy. We have established a steering group to oversee the delivery of this within NWL. - Business plan discusses NWL catchment management (The Chelmer and Blackwater Partnership), they have been involved in catchment management since 2007. NWL plan is to build on the catchment scheme and expand the scale of activity by working with catchment partnerships and delivering multiple benefits to the environment through catchment management. -NWB's catchment management project (natural flood management - NFM) links through to local-level SuDS and Rainwise Scheme where NWB supports CaBA projects. -Business plan discusses a range of catchment management processes over the short and long-term.
	<p>"We expect companies to work together with other companies and stakeholders (such as local councils, other utilities and highways agencies) to identify the most efficient and cost effective resilience solutions through groups like Water Resources South East, Water Resources East and the 21st Century Drainage Board. Companies should consider whether, and how, resilience risks could be best managed across company boundaries, at a regional level, or even</p>	<ul style="list-style-type: none"> - Extensive catchment management programmes in place since 2007 e.g. Chelmer and Blackwater Partnership. Plan until 2025 is to work with current catchment partnerships to address wider water quality issues through delivery of agri-advice, and deliver multiple benefits to the environment through catchment management, linked to environment ambitions. In NW operating area, approach to catchment management includes working with the Peatland Partnership. This has included the restoration of peatland habitats through raising water levels and preventing erosion ; therefore, increasing carbon storage and preventing carbon from running into rivers and reservoirs and causing the water to become discoloured. In the 2015-20 period NWL's contribution, together with that of other partner organisations, helped secure £10m of funding from Defra and EU Life for this work in the north of England which will continue into the 2020-25 period. - Supply chain- Developing a Common Data Environment (CDE) with NWL's partners to support the more efficient delivery of the design and build phase of projects. - Continuing to lead on procurement best practice using the Flexible Framework. NWL's will remove any remaining barriers to sustainable procurement by engaging with and supporting suppliers at the highest level to agree sustainability KPIs

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
	national level."	<p>- "NWL has ensured, through liaison with local Environment Agency Fisheries, Biodiversity & Geomorphology Teams, and via escalating issues with the Environment Agency national consistency panel, that plans meet their expectations. The latest version of the WINEP3, issued 30th March 2018, confirms the Environment Agency's acceptance of the programme.</p> <p>- Business plan discusses how NWL are building stronger economies in local areas. NWL work with a range of partnerships with Local Authorities, developers, land owners, local communities and other key stakeholders to make sure that every opportunity is taken to support development within NWLs region, ensuring that. We ensure that infrastructure capacity is available by influencing decisions through the planning process and responding to predicted growth. NWL's partnership approach to aligning infrastructure and growth has been recognised at Royal Town Planning Institute North East Awards for Planning Excellence.</p> <p>- CaBA partnerships help NWL achieve cost-effective solutions.</p> <p>- NWL's Resilience Framework covers resilience in the round and sets out progress in developing long-term plans and engagement with customers. Partnership approaches in particular allow NWL to consider and deliver cost-effective catchment solutions to benefit customers, communities and the environment, and are a key aspect of NWL's plan, as set out in flooding, environment and partnership outcomes.</p>
	"We also expect companies to work more effectively to integrate water resources and drainage management. We see scope for considerable innovation in respect of integrated water resource planning. Such approaches may well also involve collaboration across company boundaries, or between water companies and other organisations such as councils and developers."	<p>Business plan recognises that in next five years it is likely that water trading between water companies will need to be considered in the context of Regional Water Resource Planning Groups such as Water Resources East (WRE) and Water Resources North (WRnN).</p> <p>- NWL have consulted with their Water Forum, CCWater and the Environment Agency throughout the development of their metering plan.</p> <p>- NWL has liaised with local Environment Agency and Natural England teams, and via escalation to the Environment Agency's national consistency panel, to ensure plans meet their expectations.</p> <p>- NWL has ensured, through liaison with local Environment Agency Fisheries, Biodiversity & Geomorphology Teams, and via escalating issues with the Environment Agency national consistency panel, that their plans meet their expectations.</p> <p>- NWL has ensured, through liaison with local Environment Agency Fisheries, Biodiversity & Geomorphology Teams, and via escalating issues with the Environment Agency national consistency panel, that the plans meet their expectations. The latest version of the WINEP3, issued 30th March 2018, confirms the Environment Agency's acceptance of the programme."</p> <p>- NWL has ensured, through liaison with local Environment Agency Fisheries, Biodiversity & Geomorphology Teams, and via escalating issues with the Environment Agency national consistency panel, that their plans meet their expectations.</p> <p>- Business Plan discusses developing NWL</p> <p>- Within the business plan, NWL talk about developing the plan. Worked alongside the EA and NE to develop and agree the content of NWL of the Water Industry National Environment Plan (WINEP). The WINEP identifies environmental transformation activities, setting out the schemes to be delivered, level of investment required, and targets to be achieved in order to make environmental improvements that will allow NWL to meet regulatory requirements.</p>
	"In order to be corporately resilient, companies must ensure that they have the capability within their workforce to provide the services their customers expect not only today but over the long term, in the face of potentially significant changes in how they do this and in the wider employment landscape. A focus on long-term resilience should therefore also include companies identifying and addressing possible skills gaps in the future."	<p>Staff capability:</p> <p>- Workforce 2025 strategy developed to show how each competence can be improved to benefit NWL's people, the community and the customer.</p> <p>- Extraordinary leadership: keep a workforce which represents NWL's customers and greater customer participation.</p> <p>- Great Place to Work: activities in place include team manager development programme and leadership training to ensure employees keep delivering good service to customer. Also aims to be in the top 25 Best Companies List 2019.</p> <p>- Strategic Workforce Planning: to improve this area through training for SWP, predict future skills & knowledge and engage in educational initiatives in order to have free drinking water for all school children by 2030 and zero water poverty. There are also ongoing opportunities to engage and develop skills and knowledge.</p> <p>- NWL Academy: activities related to the ambition for this is to improve training and development through apprenticeships and graduate programmes. This will help inspire talent and enable NWL to develop the skills and capabilities they need now and in the future.</p> <p>- Excellent Competence: plans to have agile delivery of mandatory training in order for employees to gain new skills and embrace and drive change. Employees will also be encouraged to improve resilience by sharing knowledge with each other in attempt to deliver unrivalled customer service.</p> <p>- Future-ready Mind-set: support people so they can quickly adapt to opportunities and innovations in technology. NWD will do so through embedding new skills into competence frameworks (and activities to assess availability of skills) and create a more strategic recruitment process.</p> <p>- Culture: improvements on the work culture include having employees be more resilient and able to manage a good work life balance,</p>

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
		<p>improve communications between teams and have a 'one team' approach where managers take can also take the time to speak to their teams.</p> <ul style="list-style-type: none"> - Programme of work also underway to train 500 people managers in the business on mental health awareness and hold personal resilience workshops, which are open to all employees. - Business plan mentions the workshops and design sprints employees can get involved with, giving them the opportunity to be involved in the planning. <p>Staff engagement -</p> <ul style="list-style-type: none"> - On the GPTW strategy, NWL discusses targets to become an organisation recognised as a Great Place to Work, which in effect will increase customer satisfaction. They plan on doing so by measuring plans to key driver questions identified in the Your Voice survey 2017. - On the responses that NWL provided Ofwat following the Beast from the East, NWL state that their ethos is to have customers at the heart of everything as well as ensure customers take good care of themselves and others. NWL also have processes in place around the communication with customers. In problematic events, NWL make sure that they keep customers up to date on issues and movements through communication and constant update on social media which they believed worked well. - In the business plan it states, 90% of employees are also customers, so NWL test future plans on them allowing them to benefit through their input and personal perspective which has been shown in the plan. Multiple opportunities for employees to get involved in planning, such as workshops and design sprints. More than 500 staff have been engaged in the planning. <p>Employee health / wellbeing</p> <ul style="list-style-type: none"> - Employee wellbeing monitored to ensure people maintain good physical and psychological health. To do so, NWL have plan in place to monitor and review results of health surveillance to identify any trends and areas for improvement. - 'Safety share' initiative in place encouraging staff to share stories and experiences that others can learn from - 'Spot It' system in place to encourage reporting of health and safety issues and concerns by colleagues. Procedure in place to ensure that that suitable investigation and remedial actions are carried out, which are then monitored to ensure closure. - Team Talk, which is delivered to all colleagues and contains key messages contains key messages and discussion points including health and safety - The ELT proactively meet colleagues and discuss health and safety. This provides Directors an opportunity to observe various workplace environments and learn how colleagues keep themselves and others safe.
	<p>"When mitigating risks, it is critical that companies actively involve their customers. Customer action may well prove a cost-effective way of managing risk to service delivery, so companies should consider how best to work with customers to secure their participation in co-creation and co-delivery of resilience solutions. It is also crucial that companies work with customers to understand the impact of service disruption, so that this can best inform the steps they take on response and recovery."</p>	<ul style="list-style-type: none"> - Extensive programme of customer engagement has taken place over the past three years. Three resilience projects completed to understand customers' views on and understanding of resilience. This then extended to understanding customers' views in terms of the prioritisation of service improvements in order to determine which service improvements should be included in the plan. In addition, work has been completed to explore customer views on measuring and reporting on performance. The result of this was that customers said that they judge performance on value for money, the quality of the product and customer service. The plan aligns with this in terms of lower bills and improved service. - Further work to obtain customer insights includes a quarterly domestic tracking survey, the annual SME tracking survey and research conducted to support campaign monitoring and evaluation. Tracking research engages with more than 6,000 household and non-household customers and stakeholders each year. -Customer research was arranged in April 2018. Explain, a market research consultancy were commissioned for the research. Research sessions were held in Newcastle, Durham and Chelmsford with a total of 1298 customers in attendance. Customers were taken through each of the options including the associated impact to bills and asked to vote on their acceptance. Overall acceptability for the lead package was 70% & 82% (NW) 85% (ESW) indicating customer support. Some questions were raised at the sessions over the impacts of phosphate dosing on health and the environment. As a future strategy customers' preferred option is to replace lead pipework. -Other customer research carried out on behalf of NWL indicates that customers generally support NWL's aspirations. Focus group research (Explain, 2014) found that most participants (87%) agreed with NWL going above and beyond government requirements and spending more of customer's money on protecting wildlife and habitats. Recent workshop (Explain, 2017) indicated that participants expect NWL to be speaking to and working with the Environment Agency and other environmental organisations on environmental issues. Therefore, the scope of the WINEP is in keeping with customer's expectations. - Business plan takes into account customer research activities when setting targets and goals. - Business plan covers the 'Defining the Conversation) customer survey and customer research in great detail

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
	<p>"Company management and mitigation of operational risks should be reflected in the stretching outcome performance commitments they set. We expect to see strong links between company mitigation and management of operational resilience risks and their outcome performance commitments. These commitments should also reflect future risks and customer preferences."</p>	<ul style="list-style-type: none"> - Business Plan sets stretching strategic goals to deliver a reliable and ample supply of good quality water to customers and to deal effectively with wastewater - Plans also developed to put appropriate mitigation measures in place at sites NWL assess to be 'too critical to fail' -The draft Water Resource Management Plans commit publicly to a specific number of installations. - NWL identify the outcomes and benefits clearly within the document, the enhancement scheme is in three parts: <ul style="list-style-type: none"> - To increase the priority habitat owned by NWL by 1%. This equates to 12ha (using Natural England's GIS layer (2017) as the baseline). - Increase the biodiversity value of the land owned and / or managed by NWL. Currently a site ranking system for biodiversity (& other ecosystem services) is being developed, once this is in place, a target will be set to increase a number of NWL's sites into a higher rank – this will test the effectiveness of the ranking system. - To work in partnership in NWL's operating areas to enhance or restore 250ha of priority habitat, using Branch Out as a delivery mechanism" - Outcomes clearly identified - although they do not appear to include direct success measures ("upgrade...most key wastewater assets"):- <p>For AMP7 NWL intend to:</p> <ul style="list-style-type: none"> - Upgrade security measures on most key wastewater assets to conform to the nationally agreed standard to prevent harmful discharges to the environment; - Make further improvements to response capabilities to the loss of piped water supplies to customers, including additional rapid deployment water storage tanks; - Deliver further improvements to NWL's water tanker fleet to aid the deployment of alternative water; - Install additional equipment to assist with the prevention of flooding of assets (not in the SEMD submission – this is elsewhere with Operational Resilience); - Deliver further security improvements at the Enhanced (major) service reservoirs and water towers, and - Invest in improved technology systems to aid the 24/7 security monitoring of assets. - Outcomes clearly identified - although they do not appear to include direct success measures ("upgrade...most key wastewater assets"):- - Business plan states devised a resilience framework that cuts across the full business – encompassing corporate, financial and operational resilience – so that they are able to consider and address risks 'in the round'. Therefore by applying their Resilience Framework, it will demonstrate business resilience across corporate, financial and operational aspects.
	<p>"In PR19 we only expect to allow companies to recover from their customers the efficient costs of activities which are additional to the investment they should have undertaken in previous periods, so that customers are not paying for the same activity twice."</p>	<ul style="list-style-type: none"> - Customer research completed has highlighted that affordability and value for money are amongst the topics that they are most interested in engaging with us about (Defining the Conversation, 2016). Therefore, have specifically engaged with customers to shape plans around tariffs and measured and unmeasured methods of charging. Customers have co-created a range of innovative tariffs with us each of which are designed to increase affordability. - Business plan covers the 'Defining the Conversation) customer survey and customer research in great detail. There are 4 activates and they grouped as the following: <ol style="list-style-type: none"> 1). Continuous and ongoing insights 2). PR19 Specific Insights 3). PR19 Economic Research and Engagement 4). PR19 Acceptability Research and Engagement.
<p>11. Aligning risk and return: financeability</p>	<p>"We will promote long-term financial resilience by requiring companies to provide board assurance on their actual and notional financeability. We will set price controls to enable efficient companies, with a notional capital structure, to finance the proper carrying out of their functions. This includes investing in the services they provide by securing a reasonable return on their capital that reflects the risks they face."</p>	<ul style="list-style-type: none"> - Financeability has been tested against strong investment grade credit rating targets of Baa1/BBB+ . - Plan states there is a resilience Framework in place to inform long term investment decisions in comparison to managing present risks. The framework demonstrates the interdependency of 22 separate business areas, encompassing operational, financial, customer and corporate resilience. - NWL intend to ensure sound, long-term financial resilience by having a strong, simple capital structure in place. Also underpinned by commitment to maintaining a robust investment grade credit ratings. - Annual report / financial statements, regulatory accounting statements and additional regulatory information all feature as part of 2018/19 Assurance Plan. - Stress testing for financial resilience adheres to OFWAT minimum standards. There are only 1 or 2 exceptions to this. Where an exception applies and NW believe the scenario is not relevant to them the scenario is still considered before a more suitable scenario is agreed. All exceptions are approved by the Board. - Stress tests and their outputs are approved by the Board in order to ensure adequate review from senior leadership across the

Ofwat sub-section	Ofwat PR19 methodology	Available evidence from NWL
		<p>business.</p> <ul style="list-style-type: none"> - KPMG appointed to provide third party assurance over completion of stress tests and their outputs. - APR (Annual Performance Report) provides visibility to potential stress events up until 2025 (next 7 years) - All assumptions applied in the Business Plan are approved by the PR19 Sub-Group and the Board. - Approach to innovation strikes a balance between both known and unknown activities (and is designed to be stretching). - Business Plan is forward looking in its approach in that it will require the business to "do things differently" from what it does today. This include building a culture of innovation amongst staff. - Business enhancements / improvements are reviewed the Board to ensure that they represent value for money to customers. - Business plan states devised a resilience framework that cuts across the full business – encompassing corporate, financial and operational resilience – so that we are able to consider and address risks ‘in the round’. Therefore by applying their Resilience Framework, it will demonstrate business resilience across corporate, financial and operational aspects. -Business plan discusses financial resilience now and in the long-term.
13. Securing confidence and assurance	"Company Boards will be required to demonstrate how they have challenged and satisfied themselves that their plan will deliver operational, financial and corporate resilience over the next price control period and the long term."	<ul style="list-style-type: none"> - The Board has led the process of producing the business plan from the outset, setting clear direction and monitoring progress. More detailed scrutiny was undertaken by a subgroup which included all of the Independent Non-Executive Directors (INEDs), reporting regularly to the Board. INEDs attended a number of Water Forum meetings and events and have personally championed the customer participation and environmental aspects of the plan, leading and attending workshops with customers and environmental partners. The Board met with the Chair of Forums throughout the preparation of the plan. - A Risk & Compliance Committee is in place and regularly review current and emerging risks and challenges to business systems, critical assets and operational processes. - A dashboard has been created so the Board can track progress on various areas such as resilience and leakage - A Chief Sustainability and Resilience Officer is to be appointed to lead resilience strategy internally and lead cross-cutting resilience plans with external partners. - A variety of risks are captured in a Corporate Risk Register. The principal risks are approved by the Board and published as part of the Annual Performance Report and Financial Statements. This ensures that any risk reporting is transparent to customers. - Governance structure is driven from the Board-down and supported by management, business and independent assurance. Also have a dedicated Board Sub-group monthly meeting. - All costs included were provided and assured by internal Cost Assurance team. There are four primary approaches to costing as described below: - <ol style="list-style-type: none"> 1. Full iMod cost estimate using business as usual processes; 2. PR19 Costing Tool created from iMod base estimates; 3. Traditional unit rate builds up estimates; 4. Assessment and forecasting of historical spend. The most appropriate costing method was chosen for each scheme. - NWL’s governance and assurance arrangements cover the business including operations, planning and regulatory reporting. These are overseen by the Board and its sub-committees. Within the business plan it explains how the committees are compliant with the requirements of the UK Corporate Governance Code. - Approach to risk management, and approach to assurance for NWLs usual activities also stating where they have had further independent assurance. - Assurance plan is in place. Ensuring customers can be reported back to in a clear way.

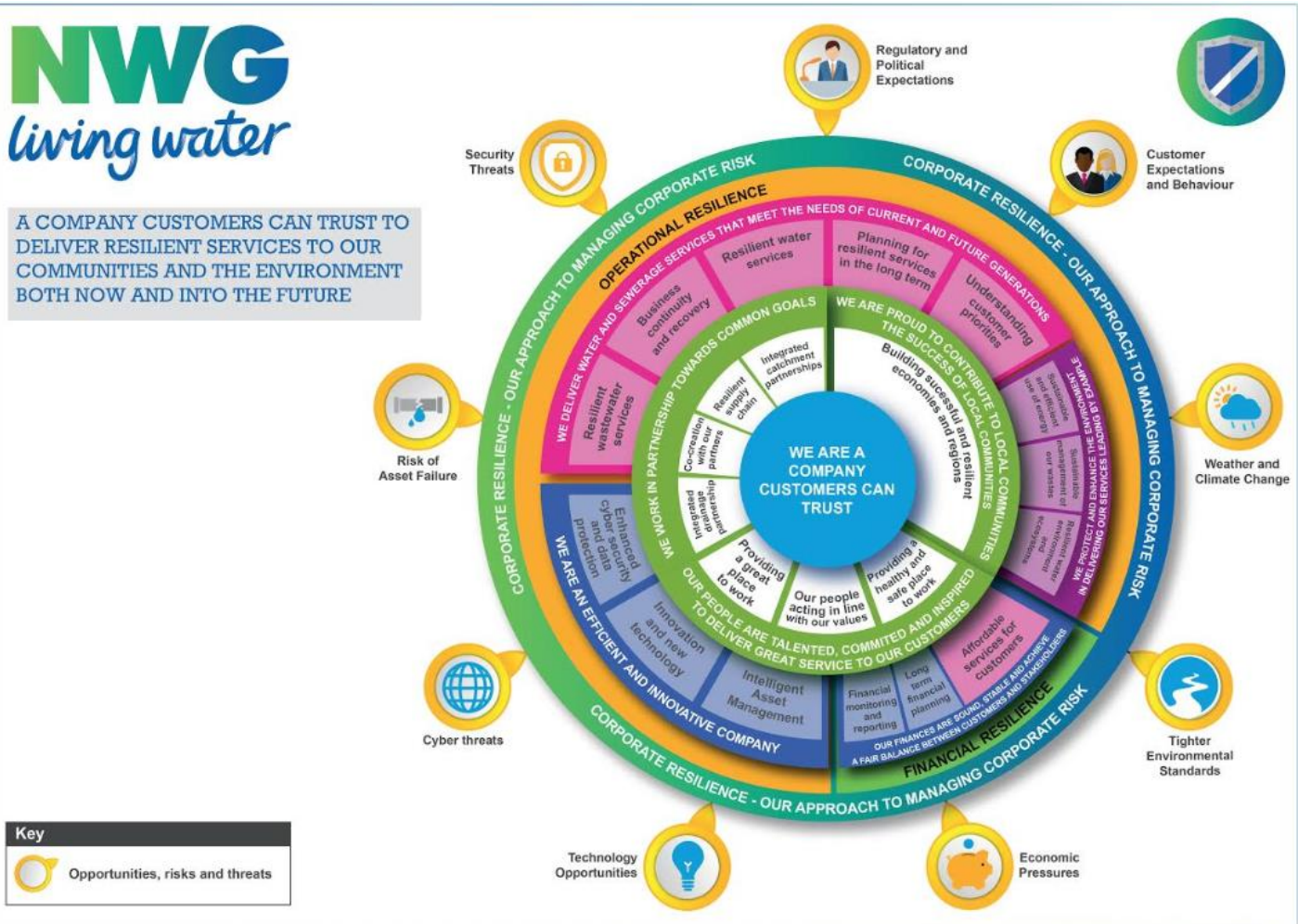
Appendix B – List of managers interviewed

Name	Position	Date
Tony Smith	IS Security Manager	26 June 2018
Lynn O'Brien	Internal Audit Manager	27 June 2018
Alison Corner	Employee Engagement Manager	28 June 2018
Mick Baker	Asset Sponsor Manager	2 July 2018
Crawford Winton	Regulation Manager	3 July 2018
Kevin Morrell	Business Continuity Manager	4 July 2018
Clare Deasy	Catchment Coordinator	5 July 2018

Appendix C – NWL Resilience Framework



A COMPANY CUSTOMERS CAN TRUST TO DELIVER RESILIENT SERVICES TO OUR COMMUNITIES AND THE ENVIRONMENT BOTH NOW AND INTO THE FUTURE



Key
 Opportunities, risks and threats

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