Water & Sewerage Services Price Control 2021-27

Final Determination – Annex E

Outputs

May 2021

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1. Introduction

1.1 Chapter 3 of the final determination main report provides a comprehensive explanation of our approach to the establishment, reporting and monitoring of outputs and outcomes for PC21.

1.2 It explains how we define outputs and how we have engaged with consumers, the company and other stakeholders to establish measures which are meaningful and drive improvements in performance.

1.3 It also summarises the key outputs that will be used for assessing delivery in the PC21 period and the key benefits that these are expected to deliver.

1.4 This annex provides further detail on how the annual PC21 targets for each of the outputs listed in the summary tables in Chapter 3 of the main document and in section 8.0 below, have been established.

2. Consumer Outputs

Current consumer measures

2.1 We currently monitor performance against a basket of consumer contact measures which cover the speed of response to customer contacts (including billing enquiries, consumer complaints, and telephone calls) and whether metered bills are based on readings.

2.2 NI Water performance for the majority of these measures is already high and comparable to the most recently reported average performance achieved by companies in England and Wales. The company's proposed targets for PC21 are based on it maintaining this relatively high level of performance throughout the price control period and have been accepted on this basis.

2.3 NI Water suggested that established targets for consumer contact (DG6, DG7 and DG9) should be dropped in PC21 given the introduction of new consumer measures. The Consumer Measures / Consumer Satisfaction Survey working group (referred to as CM/SAT) considered company representations post-draft determination and endorsed their 'semi-retirement' subject to conditions.

2.4 The conditions include:

a) continued monitoring and review by the CM/SAT Working Group until such time as we are confident they may be completely retired without any harm to the consumer;

b) more assessment of telephone and written contact and complaints handling (x3 annually at present) by the CCNI alongside their reporting such audits to CM/SAT on a regular basis.

2.5 The specifics of the above are included in our long list of consumer measures for PC21. Further details on this as well as our rationale for our decision are contained in the PC21 Final Determination Main Report – Section 3 Outputs and Outcomes, sub-Section, "Consumer views and Customer Service Measures".

2.6 The revised consumer measures are detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
DG6 % billing contacts dealt with within 5 working days	Not targeted BUT subject to CM/SAT monitoring and review					
DG7 % written complaints dealt with within 10 working days	Not targeted BUT subject to CM/SAT monitoring and review					
DG8 % metered customers received bill based on a meter reading	99.0	99.0	99.0	99.0	99.0	99.0
DG9 % calls not abandoned	Not targeted BUT subject to CM/SAT monitoring and review					
DG9 % calls not receiving the engaged tone	Not targeted BUT subject to CM/SAT monitoring and review					

Table 1: Consumer response measure outputs for PC21.

New consumer measures for PC21

2.7 In recognition of the weaknesses in the PC15 consumer measures we have been working with the company and other stakeholders through CM/SAT to develop new measures which are more customer centred. The focus was on capturing actionable data which could deliver real benefits for consumers.

2.8 CM/SAT considered and refined a range of measures and NI Water started collecting and reporting actionable data during PC15. New consumer measures have been introduced for PC21 as an outcome of this collaborative approach. These will become the real drivers for meaningful performance improvements.

2.9 Such refinement of metrics and KPIs over time is important because the data that we measure most often becomes what matters to regulated companies . The refocussing on the three new consumer measures will over time, provide actionable data and insight into how NI Water can further improve customer service.

2.10 The new consumer measures piloted during PC15 to enable PC21 targets include:

- Unwanted contacts.
- First Point of Contact Resolved.
- Net Promoter Score.

2.11 The PC21 performance targets proposed by the company for these measures have been informed by the data collected and the performance achieved following their implementation in PC15. These are presented in the

table below.

NI Water proposed Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Unwanted contacts	74,000	73,000	72,000	71,000	70,500	70,000
First Point of Contact Resolved (FPOCR) (%)	84	84	84	85	85	85
Net Promoter Score	32	33	34	34	35	35

Table 2: NI Water new consumer measures for PC21.

2.12 As a result of our draft determination consultation, further consideration of the detail of DfI's Social & Environmental Guidance regarding vulnerable consumers as well as the continued roll-out of our CPP and best practice framework, we have reviewed the setting of these targets.

2.13 We expect more of NI Water on behalf of the consumer in PC21 and have raised the targets for the three new consumer measures as shown below:

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Unwanted contacts	67,000	66,100	65,200	64,300	63,400	62,500
First Point of Contact Resolved (FPOCR) (%)	84	84	84	84	84	84
Net Promoter Score	42	42	42	42	42	42

Table 3: New consumer measures for PC21.

2.14 We also reviewed the consumer service-monitoring regime and have now included a much longer list of consumer measures and targets as well as milestones for the setting of new targets relating to vulnerable consumers and NI Water's delivery of enhanced customer service to those on the Customer Care Register.

2.15 We anticipate introducing new consumer targets during the early years of PC21 as well as at Mid-Term Review. Where there is insufficient time series data to support new targets during PC21, the new consumer metrics will over time provide the actionable data and insight we need to enable new targets as we look towards PC27.

2.16 We anticipate that CM/SAT will carry out an enhanced role of monitoring and reviewing NI Water consumer service activities. This will include oversight of many of the new initiatives we can expect NI Water to seek to introduce during PC21 as a result of our continued roll-out of CPP and best practice framework.

2.17 Further detail on the rationale for our choice of metrics / targets in our long list of consumer measures are contained in the PC21 Final Determination

Main Report – Section 3 Outputs and Outcomes, sub-Section, “Consumer views and Customer Service Measures”.

Overall performance assessment

2.18 In PC10 we introduced an Overall Performance Assessment metric as our primary measure of the service delivered by the company.

2.19 We have maintained the OPA as a time series that extends back to before the PC10 price control. The OPA time series provides comparison to England and Wales companies’ average performance level from 2009/10 and tracks NI Water’s efforts to catch up to this level.

2.20 The history of NI Water’s OPA performance is shown in the graph below, from the original Strategic Business Plan (SBP) just after incorporation of NI Water, up to the reporting year 2019/20.

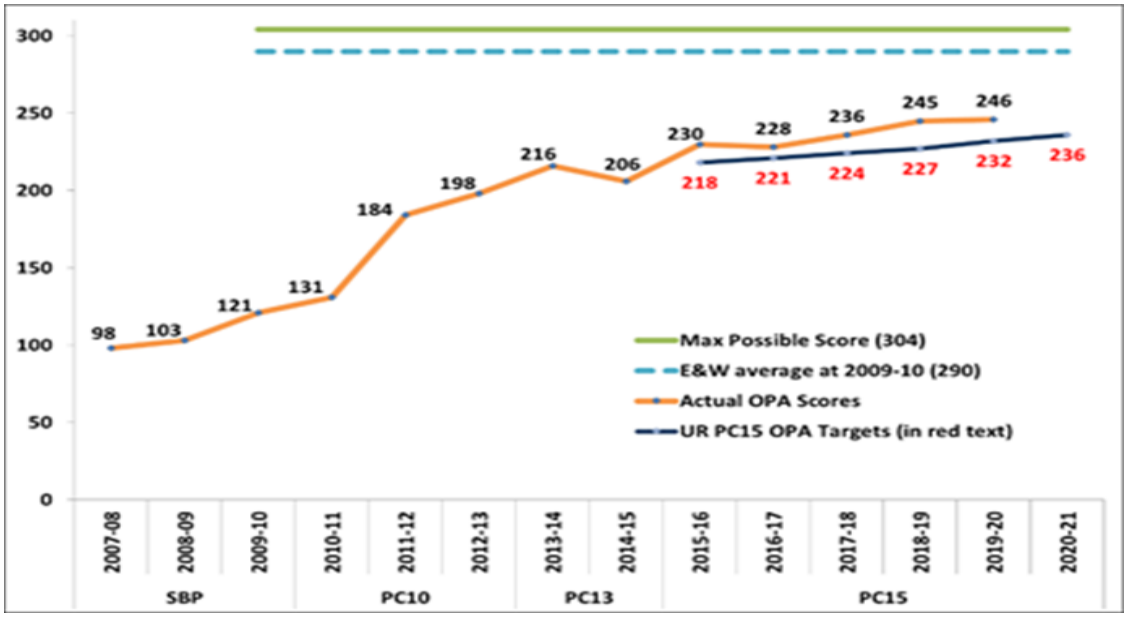


Figure 1 – NI Water OPA score from incorporation to present day

2.21 In PC21 we propose to ‘semi-retire’ the OPA and use two new metrics as our primary means of monitoring and reporting the performance of the company and the delivery of PC21:

- The new consumer service measures described above.
- The release of development constraints that are the primary driver for increased investment.

2.22 During PC21, we plan to continue monitoring the company’s Overall Performance Assessment (OPA) for information purposes. This will ensure transparency and allow comparison as we move to new consumer measures. We do not propose to set OPA targets for PC21.

2.23 Key service measures which underpin the OPA (such as water and wastewater quality compliance, pressure, interruption to supply and property flooding) will continue to be monitored and targets have been set for these aspects of consumer service.

2.24 Where we 'semi-retire' DG6, DG7 and DG9, subject to continued monitoring and review by CM/SAT, we may freeze their respective scores within the composite OPA measure. Previously we froze NI Water's customer satisfaction score when we replaced the old OPA Consumer Survey with the VoC and Omnibus replacements.

2.25 Whilst the OPA had previously been used as a means of communicating the performance of NI Water and been incorporated as a measure of a draft Programme for Government, we received no support from either consumers or stakeholders in favour of its continued retention.

3. Water Service Outputs

Overview

3.1 In this section we provide more detailed information on water service measures included in Table 3.1 of the main report, covering:

- Properties at risk of low pressure (DG2);
- Properties experiencing interruptions to supply (DG3);
- Leakage;
- Security of supply;
- Power usage;
- Drinking water quality compliance;
- Water quality at service reservoirs; and
- Nominated outputs and activities.

Properties at risk of low pressure (DG2)

3.2 Since the start of the SBP period, NI Water has developed and maintained a register of properties that are at risk of low pressure.

3.3 At the start of PC15, the number of properties on this register was 1,082. NI Water had planned to remove 836 properties during the PC15 period through company action. This should have left 296 properties on the register at the end of the period, allowing for an estimated number of 'additions'.

3.4 Although NI Water's PC21 business plan indicates that it will have delivered 853 removals by company action by the end of PC15, which exceeds the target, it also indicates that the number of properties on the register will be 649. This is much higher than originally anticipated because of an increase in the number of additions at the end of the period forecast by the company.

3.5 The company's business plan submission indicates it plans to remove 141 low pressure properties per annum during PC21. The total target of 846 compares well with the anticipated outturn for PC15 of 853 and we have accepted the company's targets for 'removals' on this basis.

3.6 However we remain concerned that the number of properties reported as being removed by company action is not reflective of service improvements, as it includes significant numbers which have been added to the register as a result of investigations rather than low pressure complaints. This issue was

highlighted by the Reporter who noted that this makes realistic target setting complex and could potentially mask the fact that genuine customers that are suffering low pressure are staying on the register for an extended period of time.

3.7 This is further illustrated by the fact that 134 (16%) of the removals planned for PC21 have carried over from PC15, despite the company indicating that its PC15 'removal' target has been met. This issue continues into PC21 where 565 (67%) of the removals relate to properties which are expected to be added to the register as a consequence of investigations and a planned refresh of the register. The Reporter has noted that in one year, 141 of the 145 planned removals are the result of data improvement activities. This means that if PC15 carry over activity is excluded, the company is only addressing 148 existing low pressure properties through capital interventions in the PC21 period.

3.8 NI Water has assumed that net additions to the register due to better information will be around 94 properties per annum during PC21. It has balanced this against the projected number of removals to estimate the number of properties that will be on the low pressure register at the end of each year. The company's assessment predicts a PC21 outturn figure of 367 properties.

3.9 The number of annual additions used by the company for PC21 (i.e. 94) appears high when compared to the average figure of 50 per annum for the first 4 years of PC15. NI Water's PC21 figure is much higher because it has assumed that a significant increase in additions in 2018-19 will be sustained to some degree for the remainder of the PC15 period and throughout PC21. The company has advised that this increase is the result of additional properties being identified through pressure logging and analysis undertaken around properties that are already on the register.

3.10 Data for 2019-20 submitted in NI Water's annual information return, however shows that this higher level of additions in 2018-19 was not sustained, with numbers returning to previous levels. As a result the 2019-20 outturn figure for total registered properties was 91 lower than the company had predicted in its business plan.

3.11 We have used the number of properties reported at the end of 2019-20 as the basis for projecting our risk register target numbers for PC21. We have also used a lower number of annual additions (i.e. 81) which we have based on the average for the last 4 years of PC21. We believe this is a reasonable approach as it takes into account the companies estimate for 2020-21 and the much higher number of additions in 2018-19.

3.12 The targets determined through our assessment result in a low pressure risk register total of 195 properties at the end of PC21 compared to the companies estimate of 367. The graph below compares our PC21 targets to the company's submission and historic targets and performance.

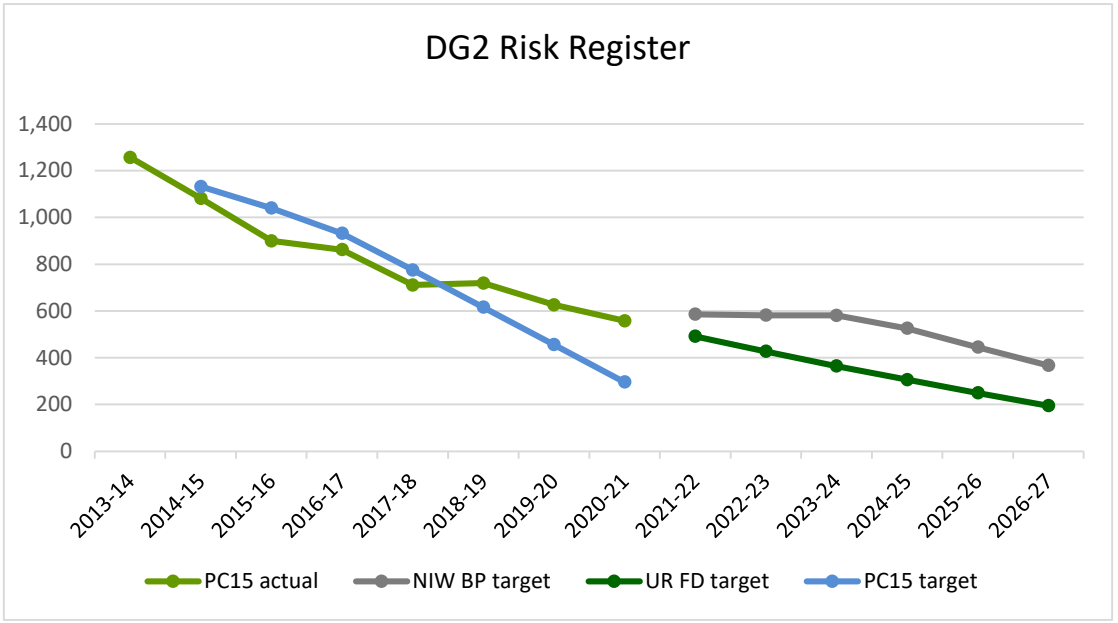


Figure 2: Properties on the DG2 risk register

3.13 The table below shows the annual low pressure targets set for PC21. The target for removals is based on the company's submission. Our risk register targets have been estimated using the approach described and presented above.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
DG2 Properties at risk of low pressure removed from the risk register by company action	147	145	143	139	137	135
DG2 Properties receiving pressure below the reference level at end of year	492	427	365	306	250	195

Table 4: DG2 outputs for PC21.

3.14 NI Water's business plan submission highlighted concerns that the information on the DG2 low pressure may not accurately reflect the number of properties experiencing low pressure. Its submission therefore included a development output to undertake work to investigate and confirm the number of properties affected. This project is intended to improve the quality and confidence in its data and deliver a full 'refresh' of its DG2 Register.

3.15 In the draft determination, we advised that we expected the company to develop a structured plan for the completion of its investigations and the delivery of the planned data quality improvements needed to establish an accurate baseline of low pressure properties. We considered this necessary to give confidence that the outcome of the process would be successful in delivering an accurate reflection of the service being provided and the

improvements being delivered for consumers.

3.16 In its response to the draft determination the company provided details of a four stage plan which would allow it to identify, confirm and address low pressure issues and also update its DG2 Register with accurate information. A programme to completion was provided as part of this submission.

3.17 We have included this project as one of the development outputs for PC21 listed in Annex T of our final determination. This annex sets out our expectations with regard to delivery, monitoring and reporting against the objective as it progresses.

3.18 In its draft determination response the company suggested we postpone setting targets for the number of properties on the DG2 Register until the refresh has been completed. It anticipates that that the register will be updated by mid-2021 and that the movement in numbers will have largely settled by then.

3.19 Whilst we recognise that we may have to adjust the PC21 targets based on the outcome of this work, we have decided to retain the targets based on our analysis in the interim. This will provide some continuity with the approach used in PC15 in the short-term pending clarification and validation of what might represent appropriate targets moving forward.

3.20 Once the modelling and investigation work is complete, we would also expect the company to use the improved information to consider what constitutes an appropriate level of service for consumers and how to best prioritise interventions to deliver the maximum benefit for consumers.

Properties experiencing interruptions to supply (DG3)

3.21 Company performance on interruptions to supply is monitored using two measures:

- The percentage of connected properties that experience interruptions lasting greater than 12hrs; and
- A composite overall performance score (OPS) calculated from the percentage of properties that experience interruptions lasting greater than 6hrs, 12hrs and 24hrs. Twice the weighting is applied to interruptions lasting greater than 24hrs in this score, in recognition of the impact that long duration interruptions have on consumers.

3.22 In previous determinations we noted that the link between DG3 improvements and investment was weak and stated that we expected the company to improve its understanding of interruptions to supply in order to develop more robust plans for improvement. We advised that we expected NI Water to consider the interaction between length of main per property,

burst rates and interruptions to supply when undertaking this work and developing its proposals.

3.23 We believe that this remains an issue with the PC21 submission, where NI Water has again undertaken a separate assessment of investment and outputs due to its inability to establish clear links between the two.

3.24 However we recognise that the company has initiated a Smart Networks Interruptions to Supply Strategy for PC21 aimed at reducing customer supply interruptions. This project is designed to produce a 'step change' reduction in interruptions and help develop NI Water's data collection potential in order to facilitate the creation of a longer-term strategy. It focusses on deploying the assets required to develop the company's awareness of their network, resulting in them being able to respond to developing risks earlier, and crucially, before customers are interrupted. The focus of the investment is in identifying asset failures and mobilising a repair team as quickly as possible. NI Water intend to achieve this by implementing both proactive and reactive solutions such as, installing critical point and other monitoring devices where necessary, and by developing a well-equipped specialist response team.

3.25 We welcome this initiative but note that the company has not accounted for any benefits that might be delivered by this significant level of investment when setting its interruptions to supply targets for PC21. Whilst it is not unreasonable for customer to pay for trials, the company should not commit to larger scale investment unless it can clearly demonstrate the benefits being delivered and has the confidence to accept performance targets to match.

3.26 We have therefore accepted that the project should proceed, but as a development objective that needs to demonstrate the benefits delivered before the company takes up the full investment planned for the PC21 period. We will engage further with the company on this project as it develops and may adjust targets or funding at the PC21 mid-term review, based on the outcome of the company's work. Annex T of our final determination sets out our expectations with regard to delivery, monitoring and reporting against this objective as it progresses.

3.27 We also recognise that any changes in the company's approach to quantifying the number of properties affected could result in a stepped change in reported performance without an associated change in the service being delivered. So this will also need to be considered and taken into account.

3.28 There has been a general improving trend in interruptions to supply performance during PC15. The company's proposed targets for PC21 show a continued improvement, but the target rate is lower than that proposed for PC15. The PC21 targets submitted by the company were based on the following underlying assumptions:

- >6hrs – an overall reduction of 300 properties (200 less than PC15)
- >12hrs – an overall reduction of 300 properties (the same as PC15)
- >24hrs – an overall reduction of 80 properties (the same as PC15)

DG3 - Supply interruptions greater than 12hrs

3.29 In the draft determination, we adopted NI Water's business plan targets for interruptions to supply greater than 12hrs. However, based on a further review of these targets, we have concluded that they are not appropriate as they lie significantly above the historic performance trend. In addition, any improvement delivered through the company's interruption to supply strategy would accentuate this issue. For the final determination we have therefore applied the same approach used for the 'DG3 Overall Performance Score' and calculated a performance range based on past performance.

3.30 We considered outturn performance since 2013-14 as detailed in the graph below:

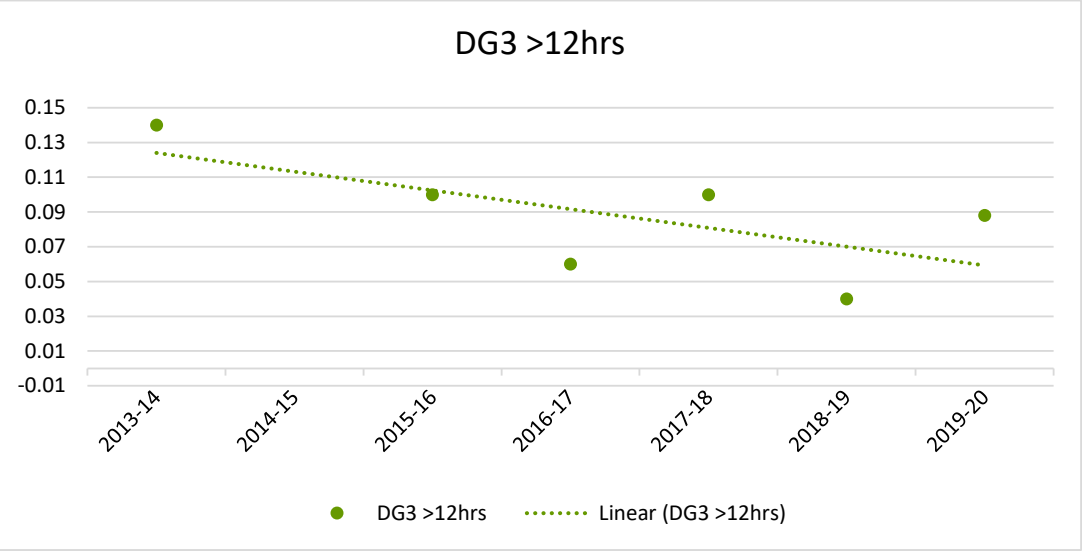


Figure 3 - DG3 >12hrs

3.31 We used the line of best fit and applied an adjustment to account for the potential reduction in the delivery of benefit over time to develop a central estimate. We then established upper and lower control limits based on multiples of the standard deviation for the historic data points.

3.32 The outcome of our assessment is detailed in the graph below. We have excluded the lower control limit in case this gives the impression that outperformance should be constrained.

3.33

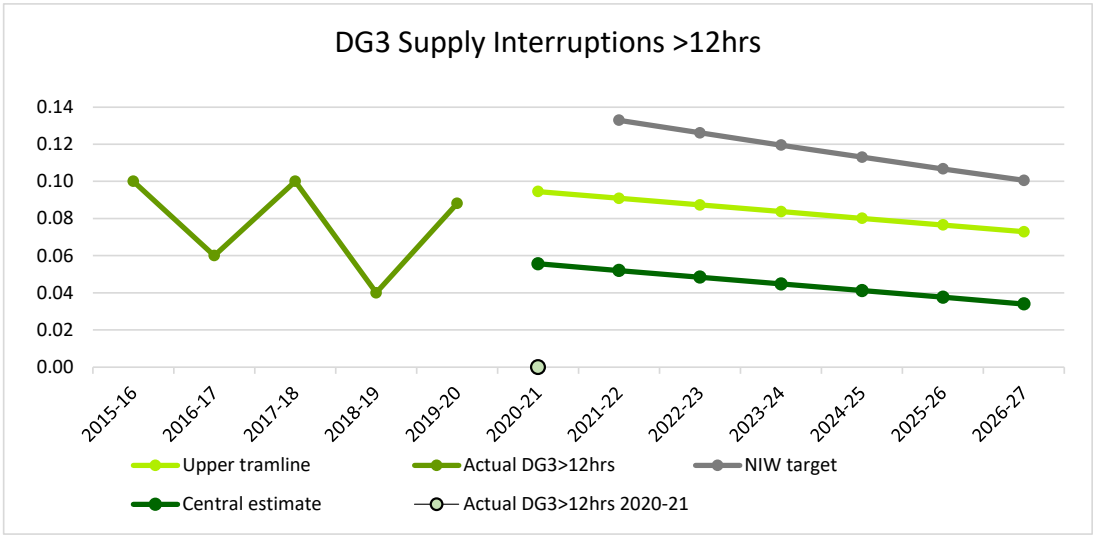


Figure 4: DG3 Interruptions >12hrs PC21 projection

3.34 This shows that the targets proposed by the company are well above the upper boundary of expected performance based on levels of performance previously achieved. We have also included the provisional outturn figure for 2020-21 in the graph to show where this sits relative to our central and upper estimates.

3.35 We have set the PC21 targets for interruptions to supply greater than 12hrs at our upper limit to account for the variability in performance for this measure. However we consider this to be an absolute limit of performance rather than a central estimate. We would expect performance in the period to remain below the upper limit of our operational performance range (excluding atypical events). If the company exceeds this target in any year we would expect it to report to us on the reasons why and the action being taking to ensure this does not happen again.

3.36 The PC21 targets for interruptions to supply greater than 12hrs are summarised in the table below. This table also includes the central estimate of our operational performance range for information.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
DG3 Supply interruptions > 12hrs Target (based on upper bound)	0.091	0.087	0.084	0.080	0.077	0.073
DG3 Supply interruptions > 12hrs – Range central estimate	0.052	0.048	0.045	0.041	0.038	0.034

Table 5: DG3 Interruptions >12hrs outputs for PC21.

DG3 – Overall Performance Score

3.37 For our assessment of the interruptions to supply overall performance score we also considered outturn performance since 2013-14 as detailed in the graph below:

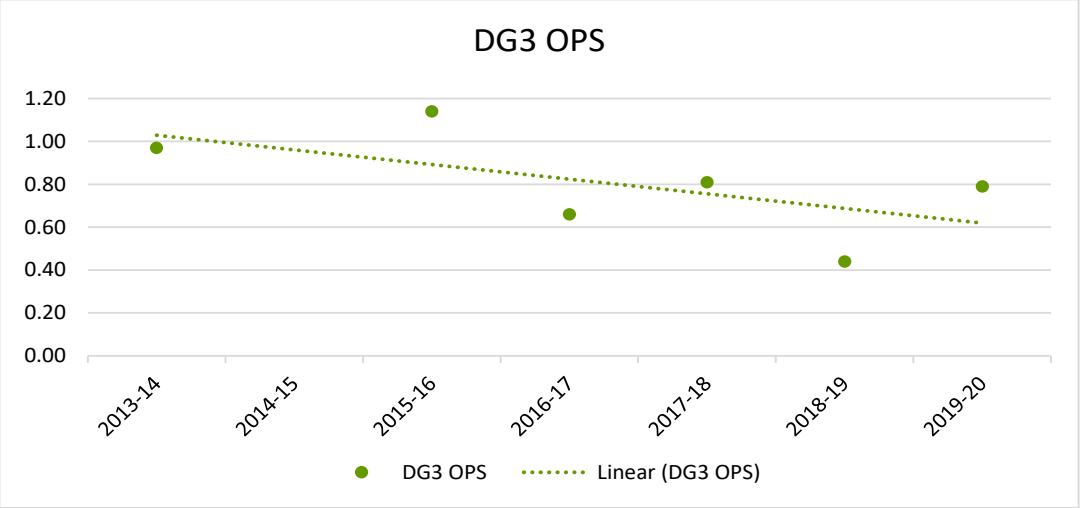


Figure 5: Historic DG3 overall performance score

3.38 We used the line of best fit and applied an adjustment to account for potential reduction in the delivery of benefit over time to develop a central estimate. We then established upper and lower control limits based on multiples of the standard deviation for the historic data points.

3.39 In the final determination, we tightened our upper limit slightly by reducing the standard error multiplier. This change was made following consideration of provisional outturn performance figures for 2020-21, which have again improved. It also recognises the need to maintain a focus on limiting longer duration interruptions, which form part of this measure, as well as the potential for the company's interruption to supply strategy to deliver some benefits in PC21. The outcome of our assessment is detailed in the graph below. We have again excluded the lower control limit in case this gives the impression that outperformance should be constrained.

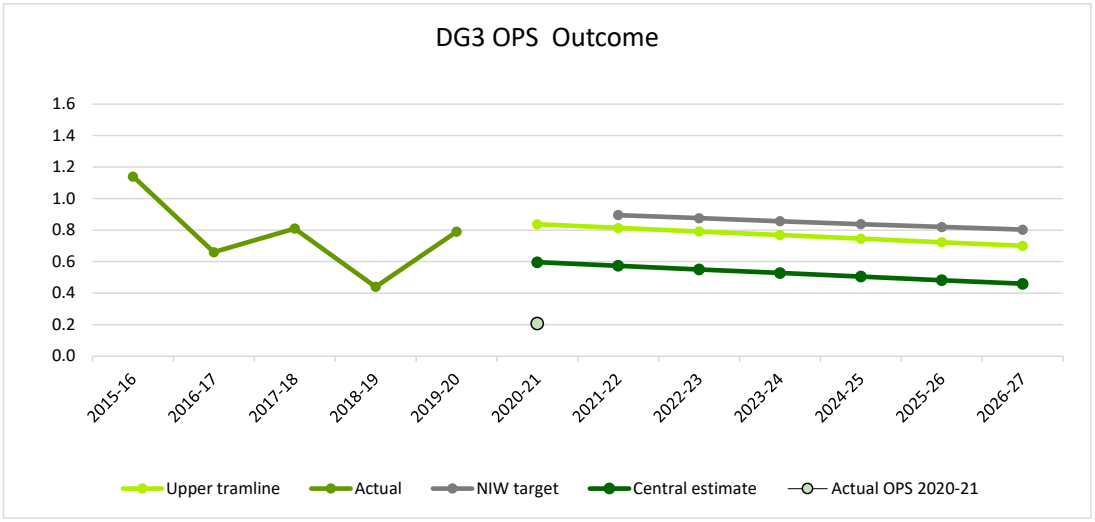


Figure 6: DG3 overall performance score PC21 projection

3.40 This graph shows that the targets set by the company are above the upper boundary of expected performance based on levels of performance previously achieved. We have also included the provisional outturn figure for 2020-21 to show where this sits relative to our central and upper estimates.

3.41 We have set the PC21 targets for the DG3 overall performance score at our upper limit to account for the variability in performance. However, we consider this to be an absolute limit of performance rather than a central estimate and would expect performance in the period to remain well within our operational performance range (excluding atypical events).

3.42 If the company exceeds our central estimate in any year we would expect it to report to us on the reasons why and the action being taking to ensure this does not happen again. We have applied this requirement to the central estimate in this case because performance for this composite measure should be more stable than for interruptions greater than 12hrs, which will be more sensitive to individual events. It also reflects the importance of restricting longer duration supply interruptions due the impact they have on consumers.

3.43 The PC21 targets for the DG3 overall performance score are summarised in the table below. This table also includes the central estimate of our operational performance range for information.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
DG3 Supply interruptions OPS – Target (based on upper bound)	0.81	0.79	0.77	0.75	0.72	0.70
DG3 OPS – Range central estimate	0.57	0.55	0.53	0.51	0.48	0.46

Table 6: DG3 OPS outputs for PC21.

3.44 We believe that our approach to DG3 target setting for PC21 aligns with the Reporter's findings. The Reporter raised concerns in relation to the company's proposed targets, noting that the information submitted by the company appeared to show that there was a comfortable gap between outturns and targets in PC15. The Reporter highlighted that ambitious but achievable targets can help drive innovation and notable service improvements for customers.

3.45 The Reporter also highlighted the need for the company to include analysis of service against expenditure with links made to root cause analysis and to use root cause analysis to establish if atypical events are inside management control or not. We agree that this is required and trust that this will form part of the company's proposed ITS strategy.

3.46 We understand that NI Water would like to discuss the potential for introducing "minutes per property" (in lieu of DG3 targets) at the PC21 mid-term review, for better alignment with practice in England & Wales. We look forward to engaging with NI Water on this issue once it has developed its proposals.

Leakage

3.47 The company has found the achievement of its leakage targets challenging in PC15. The annual PC15 leakage targets have not been met in recent years and NI Water only anticipate delivering an overall reduction of 9Mld by the end of the price control, compared to its target for reduction of 12Mld.

3.48 The company has responded to this issue by submitting a business plan containing a significant increase in expenditure for leakage control and reduction. The proposed PC21 budget equates to around £28m to reduce leakage by 7Mld over the price control period. This compares to anticipated expenditure of around £18m in PC15 for the delivery of the reduction of 9Mld. This may in part be reflective of the fact that that both the natural rate of rise and the nature of leakage detection makes controlling leakage increasingly challenging as the company approaches its sustainable economic level of leakage.

3.49 RPS Group undertook a study on NI Water's economic level of leakage in 2019 in line with the development objective set for PC15. The findings of this assessment identified a sustainable economic level of leakage (SELL) of 149.98Mld. The company used this figure to set its leakage targets for PC21 and, by the end of the period, the company plans to have attained the economic level of leakage.

3.50 We have accepted the PC21 leakage reduction targets submitted in the company's business plan on the basis that they align with the investment proposals and mean that the company will have achieved its current economic level of leakage by the end of the price control period.

3.51 In its draft determination response, the company proposed a revised profile starting at 157Mld in 2020-21. We have accepted this change and re-profiled the annual targets accordingly. The leakage targets for PC21 are summarised in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Total leakage	157	156	154	153	151	150

Table 7: Leakage output for PC21.

3.52 The company's submission includes new and innovative projects aimed at both reducing leakage and the supply interruptions experienced by customers. We recognise the benefits that this type of investment might provide in terms of leakage reduction and customer experience. However due to the nature of these projects the benefits cannot be easily quantified until they commence. We therefore intend to implement regular checkpoint meetings with the company during PC21 to review the outcome of these projects including the benefits they are delivering.

3.53 We have included development objectives associated with this work and will consider whether continued investment is justified in our PC21 mid-term review based on the evidence and findings from work undertaken in the first half of PC21. We will also consider whether leakage targets and interruption to supply targets need to be adjusted as a result. Annex T of our final determination sets out our expectations with regard to delivery, monitoring and reporting against these objectives as they progress.

3.54 The company will undertake another economic level of leakage assessment in the next 2-3 years and we will also consider whether targets need to be adjusted based on this reassessment in our PC21 mid-term review.

Security of supply

3.55 Security of supply is assessed using an index based on the number of properties in each of the company's Water Resource Zones (WRZs) that are considered to be in supply deficit.

3.56 The company's score has improved significantly since the SBP period and it now reports a maximum score of 100. In addition to capital investment, the improved assessment and modified WRZs used in the company's updated 2012 Water Resource Management Plan (WRMP) contributed to this improvement.

3.57 The company's proposed target for security of supply in all years of PC21 is 100. This assessment is based on 'dry-year annual average' demands only and when assessed on this basis is consistent with the findings within the latest Water Resource & Supply Resilience Plan (WR&SR Plan). As a result of the completion of the WR&SR Plan, NI Water is now able to calculate a

security of supply index for critical period scenarios such as a Dry Year Critical Period (DYCP) or Winter Critical Period (WCP). If an assessment was done on the basis of a critical period scenario, the predicted security of supply index would be less than 100 until work on PC21 trunk main schemes designed to mitigate against critical period deficits were completed.

3.58 We have accepted the company targets based on the Dry Year Annual Average (DYAA) for the purposes of the PC21 final determination. However moving forward we will consider whether a security of supply index based on critical period scenarios would provide a more meaningful indicator of the service being delivered.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Security of Supply Index	100	100	100	100	100	100

Table 8: Security of supply index for PC21.

Power usage

3.59 The PC15 targets for the percentage of power usage derived from renewable sources was profiled to meet the NI Assembly programme for government target of 40% by 2020. NI Water achieved this target.

3.60 For PC21 the company has indicated that it aims to increase the total percentage of green energy used by its assets to 100%. It plans to achieve this through the optimal use of its land assets, corporate power purchase agreements and REGO accreditation.

3.61 We acknowledge the ambitious nature of the company's proposals for PC21 and that it plans to achieve them at no extra operational cost compared to the benchmark. The company's targets have been accepted on this basis and the profile for delivery is detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Percentage of NI Water's power usage derived from renewable sources	45	45	50	50	75	100

Table 9: Power usage outputs for PC21.

3.62 Unlike in PC15, we do not currently have sight of the projected renewable targets for Northern Ireland as the new energy strategy has yet to be finalised. We would therefore expect the company to review its proposals if it transpires that there is an insufficient supply of renewable energy available to help avoid this self-imposed target becoming a driver for increased costs.

Water quality compliance

Overview

3.63 The Department for Infrastructure's Social & Environmental Guidance for PC21 identifies the need to, "at minimum, maintain standards of drinking water quality, in line with current standards, and to prevent deterioration in drinking water quality through sustained investment in water treatment and mains rehabilitation". The guidance does not state any minimum requirements for specific performance measures. The priority is therefore to sustain current levels of performance.

3.64 For PC15, we adopted the following three target measures for drinking water quality compliance and these have been retained for the purposes of target setting in PC21:

- Overall water quality compliance;
- Water quality compliance at tap; and
- Iron compliance at tap.

3.65 Performance data for all three measures is published in the Drinking Water Inspectorate's (DWI) annual Drinking Water Quality Report data.

3.66 Overall water quality compliance is DWI's principle measure for monitoring drinking water compliance. It is a composite measure comprising of 48 parameters, which combines the results of statutory samples taken at water treatment works (2 bacteriological and 2 chemical parameters), service reservoirs (2 bacteriological parameters) and at tap (42 water quality parameters).

3.67 Water quality compliance at consumers' taps provides a more direct measure of the service experienced by consumers as it is based solely on water quality samples taken at the point of supply.

3.68 Iron compliance is one of the 42 parameters measured at consumers' tap. It provides a simple measure for monitoring deterioration of water quality in the distribution system, which is due mainly to corrosion products from iron pipes. This is an important indicator as it is the largest contributor of failures to the composite measures for overall compliance and compliance at tap.

3.69 The investment that NI Water has proposed in its business plan is targeted at maintaining the quality of water by taking action to counter deterioration of its water mains and water treatment works. Improvements necessary to secure compliance with individual water quality parameters have also been included as enhancement investment based on the outcome of water treatment works treatability studies completed in PC15.

3.70 The outputs submitted in NI Water's business reflect its best estimate of the compliance levels that will be achieved during the PC21 period through the delivery of planned investment.

3.71 In considering the targets submitted for PC21, we have adopted a similar approach to PC15. We have considered both recent historical performance and the natural variability in reported data which is created by the statutory regime of random sampling used to assess water quality. The results of our analysis and our conclusions in relation to how performance should be monitored in PC21 are described below.

PC21 Drinking water quality compliance measures

3.72 To determine potential performance ranges for each of the three drinking water quality compliance measures in PC21, we analysed historic performance data. For the final determination, we updated our analysis to include performance data for 2019. This had not been available for the draft determination. The outcome of our assessment is shown in Figure 7.

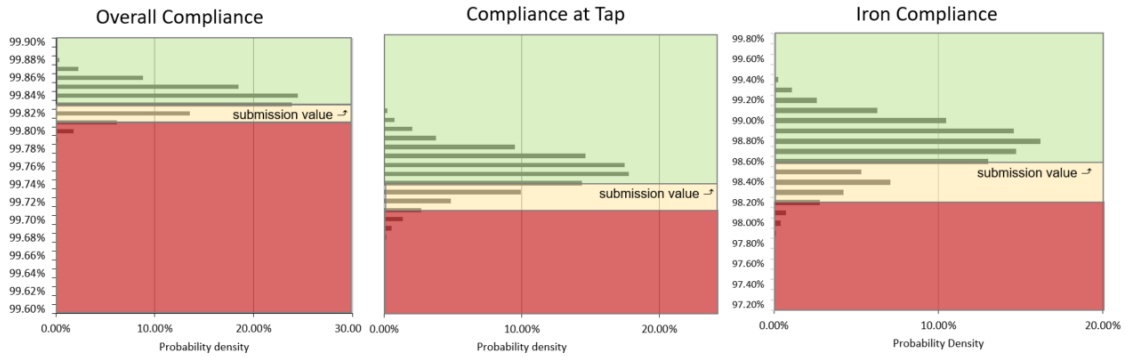


Figure 7: Drinking water quality compliance measures

3.73 This indicates that company might be expected to operate in the following performance ranges for each measure during PC21.

Output	Max	Avge	Min
% overall compliance with drinking water regulations	99.90	99.84	99.81
% compliance at consumers tap	99.82	99.76	99.71
% iron compliance at consumers tap	99.50	98.78	98.20

Table 10: UR assessed ranges for water quality compliance outputs for PC21

3.74 This analysis emphasises two points:

- There is natural background variability to reported compliance. This is caused by the random sampling regime used to assess statutory water quality compliance as well as performance issues caused by

both variability in raw water quality and process failures at water treatment works. As a result compliance will vary within a range. Our analysis indicates performance should remain within the amber and green areas of the charts; and

- Percentage overall compliance is higher than percentage compliance measured at the consumer tap. This is a consequence of the higher percentage compliance rates at water treatment works and service reservoirs that are included in the overall measure.

3.75 The minimum level of compliance that the company expects to achieve for each of these measures during PC21 is indicated by the intersection of the amber and green areas of the charts. This shows that NI Water's anticipated performance lies just below the mid-point of the range determined through our analysis for all three measures.

3.76 Our assessment suggests that actual performance could fall below these targets at certain times during PC21, however the company has confirmed that it expects to outperform these targets throughout the price control period. An assessment of performance in PC15 shows that the company has performed at or above the mid-point of our range consistently during the period and so the company's expectation may be reasonable.

3.77 We have therefore accepted the water quality targets submitted by NI Water for PC21. These are summarised in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
% overall compliance with drinking water regulations	99.83	99.83	99.83	99.83	99.83	99.83
% compliance at consumers tap	99.74	99.74	99.74	99.74	99.74	99.74
% iron compliance at consumers tap	98.62	98.62	98.62	98.62	98.62	98.62

Table 11: Water quality compliance outputs for PC21.

3.78 In their responses to the draft determination, some stakeholders expressed concerns that these targets were not challenging enough considering recent performance. However, despite updating our assessment to include compliance data for 2019 to see if this had any effect on our analysis, the outcome remained the same.

3.79 We therefore decided not to strengthen these targets in the short term. This is because our analysis suggests that some of the recent improvements may be the result of the natural statistical variation that occurs within the random sampling regime.

3.80 We will however continue to monitor performance through our annual information return and will consider whether these compliance targets should be strengthened at the PC21 mid-term review if recent improvements are found to be sustained.

Water quality at service reservoirs

3.81 The quality of water at service reservoirs is assessed using a measure based on the percentage of reservoirs sampled that have coliforms in more than 5% of samples.

3.82 NI Water has been fully compliant with this measure throughout its previous price controls and PC21 targets have been set on the basis of it continuing to maintain full compliance throughout the PC21 period.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
% Service Reservoirs with coliforms in >5% samples	0.00	0.00	0.00	0.00	0.00	0.00

Table 12: Service reservoir water quality outputs for PC21.

3.83 NI Water will undertake work in PC21 which should help maintain this performance. It will continue to prioritise service reservoir rehabilitation based on an established industry methodology introduced in PC15. Operational information, including water quality data will help inform a programme of condition assessments, which will determine the specific investment to be delivered at each site through a rolling programme of work. These assessments will be continually updated and reprioritised on the basis of emerging information and any work required as a result of water quality issues will automatically be promoted within the programme.

3.84 NI Water also completed a programme of work for replacing substandard water quality sample taps at service reservoirs during PC15 and this should help minimise the risk of non-compliance as a result of 'unrepresentative' samples and provide more confidence in the sample results.

Nominated outputs and activities

3.85 In its business plan the company identified specific nominated outputs and activities for investment. These are summarised below along with our views of the company's submission.

Water mains activity

3.86 The PC21 targets for water main activity submitted by the company included 659km of new and renewed water mains that it planned to deliver through its water mains rehabilitation programme. This programme covers water mains up to 300mm in diameter and will assist in maintaining stable service for

consumers.

3.87 The proposed activity levels for water main rehabilitation had been estimated using the company's Deterioration Risk and Reliability Model (DRRM). An additional 92km of water mains was included linked to a development project for targeted leakage interventions.

3.88 The company's submission also indicated that it planned to lay 23km of water mains through its DG2 Low pressure project and a further 14km through its Low pressure development output project.

3.89 Our draft determination target of 788km, for the total length of water mains to be delivered in PC21 under this sub-programme, included the outputs from all of these projects. It also took account of a 10km reduction for mains greater than 300mm in diameter. This represented a net increase of 120km from the 668km submitted in the company's business plan output table.

3.90 At the time the company noted that the DRRM modelling output included a number of short lengths of water main which it considered would be impracticable to replace in isolation. It suggested that the length of mains replacement required to maintain service might therefore be underrepresented. We agreed to consider this further for the final determination.

3.91 In its response to the draft determination the company advised that it had undertaken further DRRM modelling and that this suggested that the PC21 output for maintaining stable service should be 838km. This would equate to an overall target of 967 km if the lengths being delivered by the other projects included in the sub-programme are taken into account. NI Water however acknowledged that the associated budget increase for this length would be too large and so proposed that a figure of 905km, equivalent to the PC15 target, should be used instead.

3.92 We considered the company's response and the significant variations in the outputs produced by the various DRRM model runs. The latter raised concerns over the level of confidence that could be attributed to the latest figure. We also noted that output projections for PC15 indicated that the company was only planning to deliver around 830km of mains rehabilitation against its target of 905km. Checks on the PC15 performance measures used as drivers for NI Water's modelling showed that they were either stable or improving in PC15 despite this lower level of activity.

3.93 On this basis, we have decided to allow the figure of 838km from the DRRM modelling as the total length of mains to be delivered in PC21 as it is roughly the same as the anticipated PC15 outturn figure. This represents a net increase of 170km from the 668km submitted in the company's business plan table. The equivalent annual targets are detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Water mains activity - Length of new, renewed or relined mains	139.667	139.667	139.667	139.667	139.667	139.667

Table 13: Water mains activity outputs for PC21.

3.94 During our engagement with the company, it also highlighted a potential 'bow wave' of investment that might be required in PC27 as a consequence of the deterioration of its cohort of pre-1970 uPVC mains. It suggested that this might support the need for an increase in the length of mains to be delivered in PC21.

3.95 We considered the information submitted in the company's asset inventory, but concluded that marginal increases in the length of mains to be refurbished in PC21 would have limited impact on the PC27 investment requirements if this issue materialised. We therefore consider it more appropriate to wait until the problem starts to arise and to assess its extent and the associated investment requirements at that time.

Trunk main schemes

3.96 NI Water submitted the following proposals for the construction of trunk mains during PC21.

- Two trunk mains to address deficits in supply demand balance as identified in the company's water resource and supply resilience plan:
  - Carmoney to Strabane Strategic Link Watermain: This addresses a 3 Ml/d supply demand deficit in Western WRZ and provides resilience of up to 14Ml/d for an outage at one of the WTWs within Western WRZ.
  - Castor Bay to Ballydougan Trunk Main: This addresses deficit in Southern WRZ and meets supply demand balance by increasing transfer capacity from 95 Ml/d to 115 Ml/d.
- Four trunk mains to improve resilience between Water Resource Zones:
  - Northern Resource Zone Resilience: This will deliver a system which will permit up to 21Ml/d to be transferred from within the Northern Resource Zone to Ballinrees WTW to provide full resilience during an outage or major incident at the WTW.
  - Western Resource Zone – Resilience: This will provide full Western Resource Zone resilience at any one of the WTWs in

the zone during an outage or major incident by allowing transfers from the Northern Resource Zone of up to 17Ml/d. It will also address a supply demand deficit of 3 Ml/d within Western WRZ.

- ♦ Central WRZ Resilience and Supply: This will increase the imported flow from Carland SR to the Cookstown trunk main to 4.7 Ml/d. It will also improve resilience across the Central WRZ and mitigate the impact of an outage event at Lough Fea WTW or Moyola WTW.
- ♦ Castor Bay Outage September 2019: This will improve water supply resilience to Castor Bay WSZ by providing a back-feed from Dunore Point WTW and/or Drumaroad WTW. This mitigates the risk of widespread interruptions to supply in the event of a complete or partial outage at Castor Bay WTW.

- Six trunk mains to provide additional capacity in the company's trunk network supplying service reservoirs in order to maintain levels of service to existing customers:
  - ♦ High Tober.
  - ♦ Edenasop to Killeter.
  - ♦ Blacklough to Crocknabohill.
  - ♦ Woodend to Drain main.
  - ♦ Killyhevlin Cavanacross B.
  - ♦ Whitespots B.
- Two trunk mains to provide capacity for future development:
  - ♦ Skeoge Link TM: Provides additional capacity for recent growth and new development and provides the reference level of service (pressure) to some 5,000 customers.
  - ♦ Crescent Link TM: Provides additional capacity for recent growth and new development and provides the reference level of service (pressure) to approximately 1,250 customers.

3.97 These projects have been included in the final determination as they deliver consumer benefits by helping to improve security of supply, improve resilience and release constraints for development.

3.98 The profile of the delivery of these outputs is detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Completion of nominated trunk main schemes	0	2	1	5	2	4

Table 14: Trunk main nominated outputs for PC21.

3.99 This reflects the revised profile submitted by the company in its draft determination response, which has resulted in a slightly smoother delivery profile over the price control period and has reduced the number of outputs being delivered in the final year of PC21. This will help deliver benefits to consumers sooner than indicated in the business plan submission.

Water treatment works schemes

3.100 NI Water operates 23 water treatment works that deliver approximately 590 Mld into supply. This includes around 260 Mld produced by the 4 PPP water treatment works operated by NI Water Alpha.

3.101 NI Water proposed investment at 20 of its water treatment works sites in PC21, involving 22 schemes as two separate investment requirements have been identified at two of the sites.

3.102 The PC21 investment proposals fall into 2 categories.

- Investment at water treatment works where there have been persistent failures against regulatory drinking water quality standards and enforcement is in place, or where there is deemed to be a high risk of persistent failures moving forward based on assessed performance. NI Water seeks support directly from DWI for this type of investment through an 'Annex A' process. In this case, we take DWI's agreement as validation of the investment need.

- Investment to help secure general improvements in performance at other works in terms of water quality, reliability, resilience and efficiency. For example, improvements to coagulation or filtration to help make processes more robust. In this case NI Water does not seek support from DWI and we determine the need based on the evidence submitted by the company.

3.103 The Annex A proposals cover the water quality investment the company believes is required at the following nine water treatment works sites:

- Killyhevlin; Clay Lake; Lough Fea; Seagahan; Altnahinch; Dungonnell; Drumaroad; Derg; Caugh Hill.

3.104 At the time of the draft determination the company also indicated that it planned to submit Annex A proposals to DWI for the following four Alpha

PPP sites in advance of the final determination:

- Castor Bay (Alpha PPP); Dunore Point (Alpha PPP); Ballinrees (Alpha PPP); Moyola WTW.

3.105 DWI has completed its assessment of the need for water quality investment at the nine 'non-Alpha PPP' sites. Following the provision of additional information by NI Water, DWI has confirmed that investment is required due to water quality concerns. These schemes have been included as nominated outputs for PC21 as a result.

3.106 NI Water did not submit Annex A proposals for the Alpha WTW sites to DWI as anticipated. In its response to the draft determination, the company indicated it would be unable to do so until early 2022. We are not prepared to include schemes for quality improvements at these sites until DWI have confirmed their support through the established Annex A process.

3.107 We have therefore excluded the Alpha PPP sites as nominated outputs in the final determination in line with the approach we adopted for the draft determination. NI Water should seek approval for the inclusion of additional enhancement projects at these sites through the formal Change Control mechanism once the Annex A approval process has concluded and the need has been confirmed.

3.108 It should however be noted that we have allowed carry over expenditure from PC15 for essential work required to address MCPA failures at one of the Alpha sites (Balinrees WTW). This was the subject of enforcement action by DWI and stakeholder budget approval during PC15, but was not completed by the company as planned. We have therefore included an additional nominated output 2023-24 specifically related to this work in the final determination.

3.109 The remainder of the investment proposals cover other general improvements required at the following nine water treatment works sites:

- Loughmacrory; Fofanny; Carran Hill; Belleek; Glenhordial; Lough Bradan; Killyhevlin; Carmoney; Glenhordial.

3.110 We recognise that some level of ongoing investment to help secure general improvements in performance in terms of water quality, reliability, resilience and efficiency is likely to be required at these sites. We have therefore included them as nominated outputs for PC21.

3.111 The profile for delivery of the nominated water treatment outputs in PC21 is shown the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Completion of nominated water treatment works schemes	1	0	6	4	1	7

Table 15: Water treatment works nominated outputs for PC21.

3.112 This reflects the revised profile submitted by the company in its draft determination response in which it pulled forward the water treatment works delivery profile slightly. This includes the delivery of Caugh Hill which has been brought forward from 2026-27 to 2024-25. This goes some way to addressing stakeholder concerns over the 'back end' loading of the profile originally submitted and will help deliver benefits to consumers sooner than previously anticipated.

Service reservoirs and clear water tanks

3.113 NI Water included proposals to increase the capacity of one service reservoir and two clear water tanks in PC21. There is also funding included to allow it to complete one PC15 scheme. Details are provided below:

- Loughmacrory Hill SR. The existing service reservoir has a capacity of 0.8Ml and holds less than 3.5 hours storage for the 6,000 customers served. NI Water proposes constructing a new 5Ml reservoir at a new site close to the existing reservoir to address the significant shortfall between the current storage and the average service reservoir storage of 35hrs. The company has identified the primary driver for this scheme as supply demand and security of supply risks. The provision of additional capacity will minimise the risk of supply interruption to customers in the area.

- Fofanny Clear Water Tank. The existing clear water tank has a capacity of 15Ml and has a storage time of around 7hrs at peak demand. It distributes water to a population of 76,500 across the water resource zone, of which 8,000 receive direct supply from the tank. The company proposes constructing a new 10Ml clear water tank at a new site close to the existing one to increase overall capacity to 25Ml. This will help address the shortfall to the average clear water tank storage position of 24hrs. The project has been prioritised due to growth in the area. This has resulted in the current reservoir being undersized and unable to cope with diurnal demands. The company highlights unplanned interruptions that have occurred as a consequence of this and the lack of further development potential in the area.

- Seagahan Clear Water Tank. The existing clear water tank has a capacity of 2.3Ml and has a storage time of around 5hrs at peak demand. It serves an estimated population of 32,500 and due to development in the area, is now undersized. The company proposes constructing a new 8Ml clear water tank at a new site close to the existing one to address the significant shortfall between the current storage and the average service reservoir storage position of 24hrs. The company states that the lack of available storage in the existing tank has led to customer interruptions and is preventing further development in the downstream network.

- Drumaroad CWT. This scheme is being carried over from PC15 and is mostly complete. The company is in the process of constructing a 35Ml tank. This is to increase storage for the gravity supply to Belfast from less than 1hr to around 6hrs. Funding for this scheme was approved in PC15.

3.114 The initial submission did not explain the need for these schemes clearly enough and so we asked the company to provide additional clarification through the query process.

3.115 The company provided additional information to support its original business case and we are satisfied that each project is justified on the basis of risk. We have therefore included all the new schemes in the list of nominated outputs for the final determination as detailed in the table below. For the final determination we have included the carry over scheme at Drumaroad as a nominated output. This will be delivered in the first year of PC21.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Completion of nominated improvements to service reservoirs and clear water tanks	1	0	0	0	3	0

Table 16: Service reservoir and clear water tank nominated outputs for PC21.

3.116 In the draft determination we noted that the three new schemes were planned for delivery towards the end of PC21. We asked the company to consider whether it could bring any of this investment forward so that the risk to consumers could be addressed earlier. Unfortunately it was unable to do so.

Lead communication pipe replacement

3.117 The target set for proactive lead communication pipe replacement in PC15 was 1,844 per annum or 11,064 over the price control period. NI Water

expects to outperform this target in PC15 and deliver 11,203 replacements.

3.118 Key stakeholders have agreed that NI Water should continue the PC15 rate of replacement into PC21. The company's PC21 targets are therefore as follows.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of lead communication pipes replaced through the proactive lead programme	1,844	1,844	1,844	1,844	1,844	1,844

Table 17: Proactive lead replacement outputs.

Number of school visits and other educational events

3.119 NI Water has based its targets for the number of school visits and the number of educational events in PC21 on the targets that were set for PC15. The proposed targets have been accepted on the basis that this represents a reasonable level of activity.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of school visits	176	176	176	176	176	176
Number of events	57	57	57	57	57	57

Table 18: Number of school visits and events.

3.120 The company should continue to set out its plan for education campaigns describing how these campaigns will be designed to change behaviour and monitored to assess awareness and effectiveness. We would expect this to be informed by the experience and learning gained in PC15.

Other general investment

3.121 In addition to the nominated outputs, funding in the PC15 determination will allow NI Water to:

- Complete inspection and maintenance work at impounding reservoirs associated with the Reservoirs Act and the Panel Engineer assessments undertaken in PC15:
- Complete the next round of impounding reservoirs inspections and complete inspections at all controlled service reservoirs;
- Complete the next water resource and supply resilience plan;
- Complete the next economic level of leakage assessment;

- Complete security hardening work required at service reservoirs to comply with guidance issued under the Preservation of Services and Civil Emergency Direction 2010. We expect the department and NI Water to agree the extent of the programme of work and the priority in which it is to be undertaken;
- Continued rehabilitation of NI Water service reservoirs through a prioritised rolling programme of work;
- Invest in project development, design and procurement to secure continuity of investment into PC27; and
- Continue to make new connections to the water supply system. This includes service connections and requisitions as well as laying new water mains within new developments.

4. Sewerage Service Outputs

Overview

4.1 In this section we provide more detailed information on sewerage service measures included in Table 3.2 of the main report covering:

- Properties at risk of out of sewer flooding (DG5);
- Wastewater treatment works compliance;
- Pollution incidents; and
- Nominated outputs and activities.

Sewer flooding

4.2 The need to reduce the risk of out of sewer flooding is consistently identified by consumers as a high priority. The outcome of the consumer engagement undertaken for the last price control showed that consumers are most willing to contribute to improvements which have a direct impact on their daily lives, such as flooding.

4.3 NI Water maintains a register of properties which are at risk of internal flooding. The DG5 performance measure used to set price control targets relates to properties considered to be at risk of internal flooding as a result of hydraulic incapacity of the sewerage system.

4.4 At the start of PC15 there were 179 properties on the flooding register which were at risk of flooding more frequently than 1 in 20 years. The company's target was to remove 62 properties in PC15. In its PC21 business plan submission NI Water indicated that it expects to have removed 46 properties by the end of the PC15 period, which represents a shortfall of 16 against the PC15 target. NI Water acknowledges that this sub-programme has been subject to considerable change during PC15 with several of the PC15 nominated projects being subject to delay and change in scope.

4.5 The company also had a target for the number of properties on the risk register at the end of the period which was 124. The company expects to achieve this target despite the shortfall in the number of properties removed by company action. This is because the net movement in property numbers on the register due to better information has been negative rather than positive as assumed at the time of the PC15 business plan submission. The net reduction in the first five years of PC15 has been 15.

4.6 For PC21, the company has proposed removing 57 properties by company action. This is similar to the target proposed for PC15 and 11 higher than the anticipated PC15 outturn.

4.7 However in establishing its annual targets for the number of properties on the register, the company has assumed that there will 6 net additions per annum, equating to 36 over the PC21 period. This means that the register total would only reduce by 21 by the end of PC21 despite its target of 57 removals. Accounting for the PC15 carry over of 16 properties and the addition of 36 properties, it can be seen that the PC21 target only equates to 5 existing properties being removed over the period. This would not appear to be an ambitious target for an issue that the company has acknowledged is the top priority for its consumers. It would also indicate that properties including additions would be staying on the register for an extended period of time. Our expectation is that once a property has been confirmed through modelling it would be removed within a 6 year price control period.

4.8 The justification for NI Water's assumption that an average of 6 properties will be added to the register each year in PC21 is not clear. We note that even if the impact of removals due to better information is ignored, the additions due to better information (actually flooded or modelled) in the first five years of PC15 only averaged 3 per annum. NI Water's assumption is therefore not reflective of recent performance data. The conservative nature of the company's approach is evident in the outturn figure for 2019-20 which was 4 properties lower than the business plan estimate.

4.9 In establishing the DG5 risk register targets for PC21 we have taken account of the 2019-20 outturn data and used this as the basis of our PC21 projections. We have accepted the company's figures for properties removed by company action and applied these moving forward. We have then allowed for additions to the register at the annual rate experienced in the first 5 years and taken the conservative approach of not allowing for any removals due to better information.

4.10 The targets determined through our assessment result in a DG5 risk register total of 78 properties at the end of PC21 compared to the companies estimate of 103. The graph below compares our PC21 targets to the company's submission and historic targets and performance.

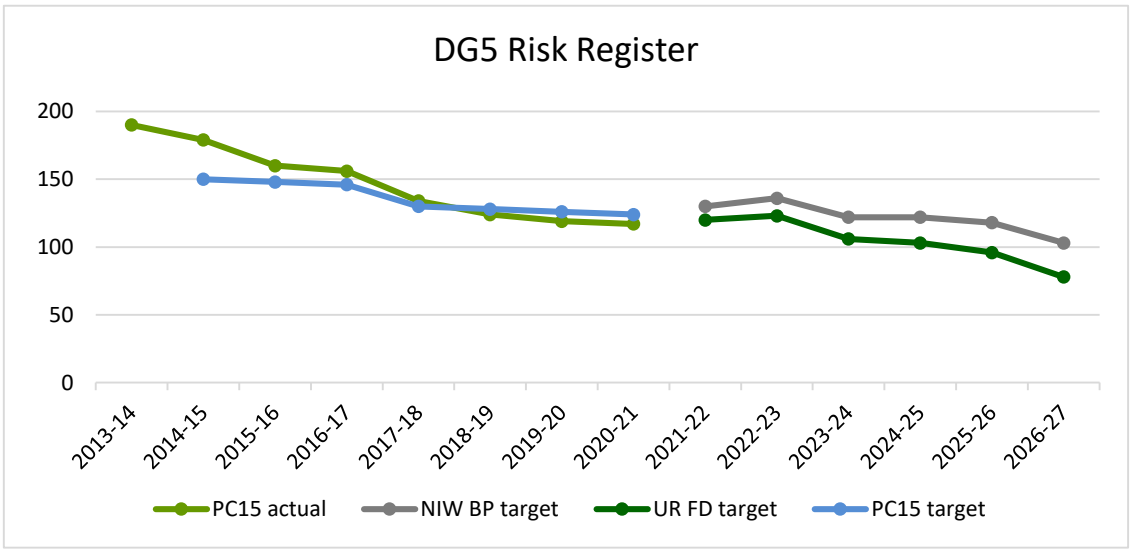


Figure 8: Properties on the DG5 risk register

4.11 The table below shows the 'out of sewer' flooding targets set for PC21. The target for removals is based on the company's submission and the risk register targets are based on the outcome of our assessment as explained and presented in the graph above.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
DG5 Properties at risk of flooding - number removed from the 2 in 10, 1 in 10 and 1 in 20 risk register by company action	0	0	20	6	10	21
DG5 Properties on the 2 in 10, 1 in 10 and 1 in 20 risk register at the end of the year	120	123	106	103	96	78

Table 19: DG5 outputs for PC21.

Wastewater treatment works compliance

4.12 In PC21 we intend to monitor wastewater treatment works compliance using the same measures that were used in PC15, i.e.:

- % of WwTWs discharges compliant with numeric consents.
- % of total population equivalent (PE) served by WwTWs compliant with numeric consents.
- Small WwTW compliance (works greater than or equal to 20PE but less than 250PE).

4.13 Wastewater treatment works performance can be affected by a range of factors including weather conditions. In the case of NI Water, which operates works that need to be upgraded, this can cause variations in compliance from year to year.

4.14 Our approach to establishing appropriate compliance targets for PC21 tries to account for this issue. We have used information on the historic performance of NI Water's treatment works to estimate the likely range of compliance now and into the future. This has been done on the basis of the probability for failure.

4.15 In our draft determination we set targets at the bottom of our estimated performance range. This was because NI Water's proposed targets were below our assessed minimum level of performance.

4.16 In its draft determination response, the company proposed new targets. These incorporated:

- Changes NI Water had made to the delivery profile for wastewater treatment work schemes.
- Changes to the population equivalent of individual works agreed with NIEA.
- Assumptions that an increased number of works would be non-compliant in PC21.
- Compliance data for 2019 which had not been available at the time of the business plan submission.

4.17 For the final determination we updated our performance range assessments for percentage works compliance and percentage population equivalent compliance. We updated both to include 2019 compliance data and to take account of the revised delivery profile submitted by the company in its draft determination response.

4.18 We also adjusted the population equivalent compliance assessment to account for the revised PE figures agreed by NIEA and NI Water, having confirmed these will be used for compliance monitoring from 2021 onwards.

4.19 Our updated range for percentage works compliance is shown in Figure 9 and our updated range for percentage population equivalent compliance is shown in Figure 7. We have also included NI Water's recent actual performance and its PC21 targets for comparison. The targets submitted in the company's original business plan are denoted by the dashed black line and the targets the company submitted in its draft determination response are denoted by the solid black line.

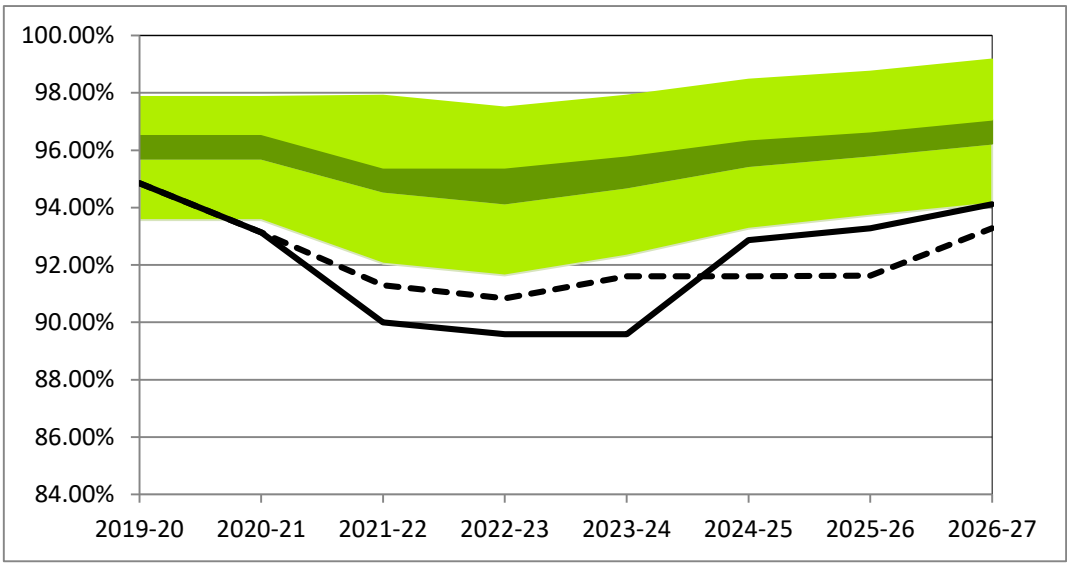


Figure 9: Operating range for % of WwTWs whose discharges are compliant with their numeric consents.

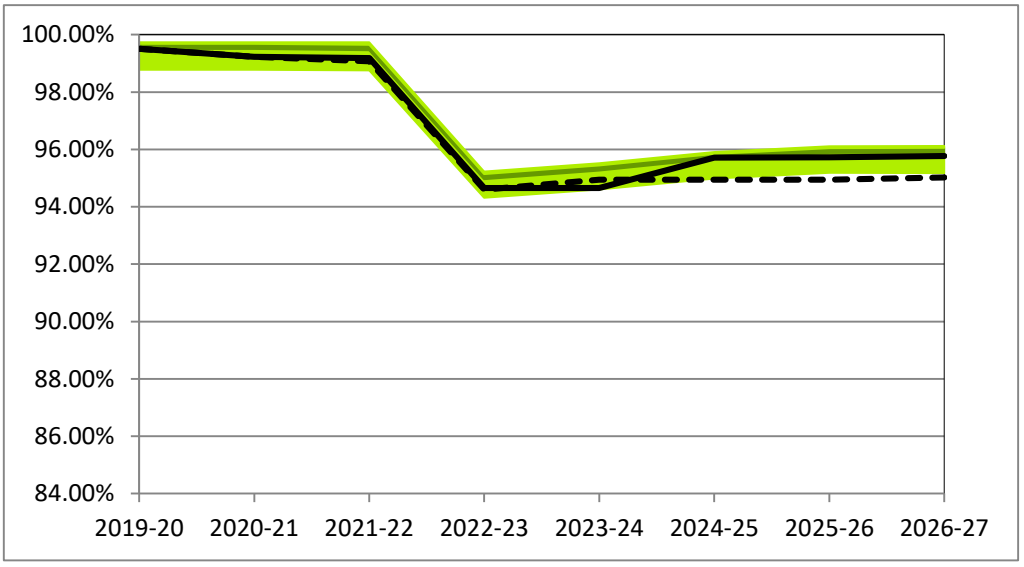


Figure 10: Operating range for % of population equivalent served by works which are compliant with their numeric consents.

4.20 The light green bands represent the lower and upper quartiles of probability density in our assessments, while the dark green band represents the central 50% of probability density. The step change in performance for percentage population equivalent compliance in 2022-23 reflects the fact that two relatively large works will become non-compliant due to a change in consent standards in that year.

4.21 It can be seen that NI Water's proposed targets follow a similar trajectory to our assessment for both compliance measures.

4.22 For percentage population equivalent compliance NI Water's targets now lie within our range. This is because we have adjusted our assessment to

reflect the slightly higher PE numbers that NIEA has advised will be used for compliance monitoring in PC21.

4.23 For percentage works compliance NI Water's targets still lies below our predicted operating range. There are a number of reasons why this is the case:

- NI Water has assumed that works that failed in an unannounced sampling pilot scheme during PC15 will continue to fail in the future. NI Water expanded the unannounced sampling regime across all sites during 2020, which increased the number of works it was assuming would fail since the business plan submission. There is no evidence to support this. The agreed regulatory framework for compliance monitoring and reporting is not due to change in PC21. Compliance for these works will therefore continue to be assessed and reported under the same compliance framework as it was prior to the pilot. This has been confirmed by NIEA. We have therefore not taken a similar approach of altering the treatment of these works in our assessment.

- NI Water also considered the possible impact of known risks at certain works. Our assessment relies on these risks appearing in previous year's performance, which changes the calculated risk of failure for each works in our analysis.

- There are five small works which are due to cross the threshold into the greater than 250PE size band in PC21 and there is one works which will move from a coastal consent to a river consent. We have assumed that 50% of these works will pass. In response to our draft determination, NI Water accepted this approach.

4.24 For the reasons outlined above we do not consider the company's proposed targets for percentage wastewater treatment works compliance to be appropriate. We have continued to take a conservative approach to the application of our analysis and set the PC21 targets at the bottom of our operational performance range.

4.25 For percentage population equivalent compliance we have accepted the revised targets proposed by the company in its draft determination responses. This is because the company's targets now lie above the bottom of our range.

4.26 These targets represent the minimum level of performance we expect the company to achieve and we would expect NI Water performance to lie above these targets during PC21.

4.27 We have concluded that the target proposed for small WwTW compliance

(works greater than or equal to 20p.e. but less than 250p.e.) reflects the current level of assessed compliance and the proposed investment. We note that NI Water estimate that only 3 out of about 300 small WwTWs will be non-compliant at the end of the PC21 and that this represents a reduction of around 27 from the final year of PC15.

4.28 A summary of the wastewater compliance targets set for PC21 is provided in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
% of WwTWs discharges compliant with numeric consents	92.05	91.63	92.33	93.26	93.72	94.14
% of total p.e. served by WwTWs compliant with numeric consents	99.18	94.65	94.65	95.71	95.72	95.77
Small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.)	90.76	91.09	93.07	95.05	97.03	99.01

Table 20: Wastewater treatment works compliance outputs for PC21.

Pollution Incidents

4.29 The number of high and medium pollution incidents attributed to NI Water is higher than the level of pollution incidents attributed to water and sewerage companies in England and Wales. The company has previously noted a low level of investment in the sewerage system in Northern Ireland compared to investment in England & Wales over the last 20 years as a cause of this lower level of performance.

4.30 The company's business plan submission forecasted an outturn of 23 high and medium pollution incidents at the end to PC15. This appeared to be based on its final year target for PC15, rather than performance achieved, as the reported number of incidents at the end of 2019-20 was already significantly lower at 13. This issue was highlighted by the Reporter who indicated that the company's outturn figure was not a legitimate final year forecast based on historic trending, risk analysis or other asset management decision making factors.

4.31 The company's submission stated that it had based its PC21 forecast targets on historical trend analysis. This is not evidenced by the data as the company's projected target at the end of PC21 is higher than actual performance in 2019 -20. This anomaly results from NI Water using a starting point for its projections which is significantly higher than actual performance achieved in PC15.

4.32 The average annual reduction of around 1.3 adopted by the company in PC21 is approximately 60% of the average annual reduction achieved in the first 5 years of PC15. This might not be unreasonable as returns might be expected to diminish over time as the number of incident becomes lower.

4.33 The company suggested to the Reporter that its assessment had included allowances for weather, blockages, capacity issues, increased use of monitors and changes in regulatory approach. However, the Reporter was unable to identify any analysis that attempted to estimate what incremental allowance had been allowed in the forecast for each of these factors or why it was appropriate.

4.34 We therefore believe that more challenging targets, which take account of the sustained improvement delivered by the company to date, should be set for high and medium pollution incidents in PC21.

4.35 Our projected targets have been established by considering the historic rate of improvement and then allowing for diminishing returns on performance as the number of pollution incidents reduces. Our assessment results in an annual reduction similar to that used by the company. However the PC21 outturn figure of 7 high and medium pollution incidents is much lower than the company's, as we have projected our figures from current actual performance.

4.36 The outcome of our assessment aligns closely with the findings of the Reporter who indicated that a target of around 5 to 8 incidents by the end of the PC21 period would be more appropriate than that proposed by the company. We note that this would bring NI Water broadly in line with average performance in 2018-19 for the six water and sewerage companies in England and Wales that report a comparable measure.

4.37 The graph below shows the outcome of our assessment. It compares our PC21 targets to the company's submission and historic targets and performance.

4.38

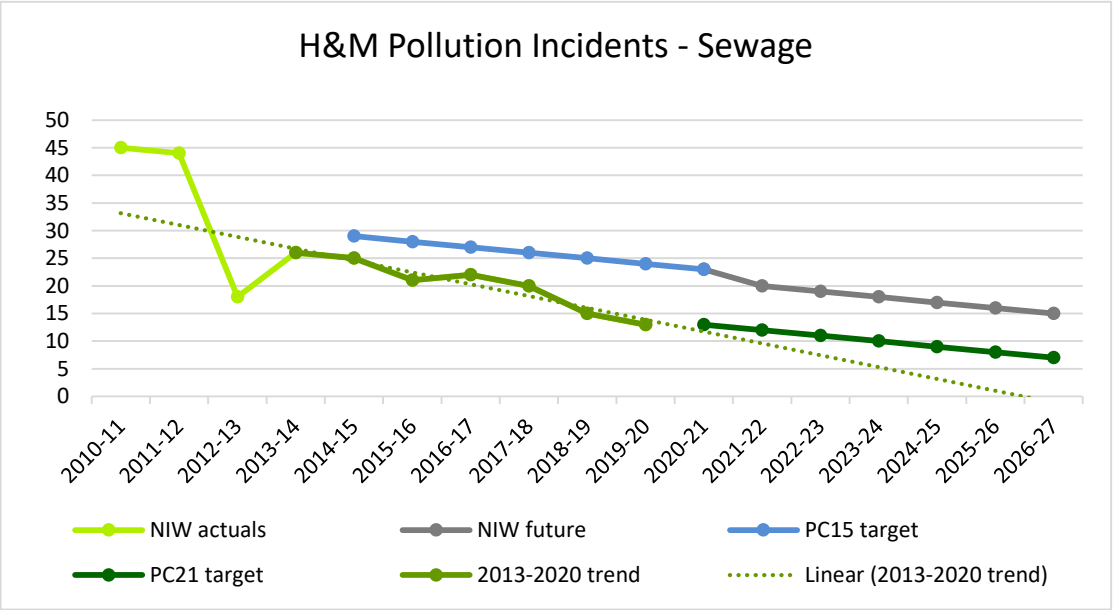


Figure 11: Pollution incident performance and targets.

4.39 Our annual targets for high and medium pollution incidents in PC21 are summarised in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of high and medium pollution incidents attributable to NI Water	12	11	10	9	8	7

Table 21: High and medium pollution incident outputs for PC21.

4.40 In its response to the draft determination the company indicated that data reporting from event and duration monitors on CSOs and a change to NIEA's approach to inspections had the potential to increase the number of reported incidents. As a result it proposed an increase in the targets or the establishment of a performance range with the lower boundary set at our targets and the upper boundary set at the targets proposed in the company's draft determination response.

4.41 For the final determination, we have retained our more challenging targets in recognition of the lower level of comparative performance achieved in Northern Ireland and the significant increase in the level of sewerage and wastewater investment included in PC21. However, we will continue to monitor the impact of the issues noted in the company's response, including whether an adjustment to targets in the future is justified as a result.

4.42 In the PC21 audit report the Reporter suggested the company should:

- Use continuously updated estimates of risk and performance in order to target operational activities and investment.

- Examine the link between investment and service for the wastewater infrastructure sub-service, as there was limited evidence of the company aligning expenditure on pollution related activities and service.

- Incorporate further specifics and granularity into the root cause analysis to allow more sophisticated risk management and asset management approaches to feed into investment decision making, work planning and forecasting.

4.43 We concur with the Reporter's suggestions and expect the company to take action to put them in place

Nominated outputs and activities

4.44 Nominated outputs and activities have been identified for:

- The length of sewer replaced or relined;
- Improvements to unsatisfactory intermittent discharges;
- Improvements to wastewater treatment works; and
- Improvements to small wastewater treatment works.

4.45 These nominated improvements deliver specific quality improvements required by NIEA and form an integral part of the outputs to be delivered. They also contribute to the improvement in the overall wastewater compliance targets described in Section 4.12.

Sewers replaced or renovated

4.46 The company proposes to renovate and renew around 61km of sewers over the PC21 price control period as detailed in the table below. This compares to a target of 74km and a projected outturn of 75km in PC15. The company anticipates that the majority of the PC21 output length will be delivered through renovation rather than replacement.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Sewerage activity - Length of sewers replaced or renovated	10.1	10.1	10.1	10.1	10.1	10.1

Table 22: Sewerage activity outputs for PC21.

4.47 The rate at which sewers are renewed or replaced is remarkably low when compared to the 16,200 km of existing sewers. While this rate may reflect the age profile of the existing sewerage stock and the long life of sewerage assets, it is not supported by a robust assessment of need.

4.48 In PC15 we said that we expected the company to move from the current top-down approach to investment planning to a risk based bottom up approach for identifying appropriate levels of activity.

4.49 The company has introduced deterioration, risk and reliability modelling for PC21 and used it for some elements of the submission. However the company did not consider it robust enough to estimate requirements for this part of the programme. The company therefore used PC15 run rates to estimate requirements for PC21.

4.50 We expect the company to continue to develop the capability of its risk based methodology during PC21 so that it can use it confidently to establish clear links between investment and outputs in its submission for PC27.

Nominated improvement to unsatisfactory intermittent discharges

4.51 NI Water has a significant number of combined sewer overflows and wastewater pumping stations that can discharge to the environment. Compliance standards for these discharges are set by NIEA and overflows that are in breach of compliance are known as Unsatisfactory Intermittent Discharges (UIDs).

4.52 The company expects to deliver improvements to 62 UIDs in PC15 against a target of 78. NI Water acknowledges that this sub-programme has been subject to considerable change during PC15 with several of the PC15 nominated projects being subject to delay and change in scope.

4.53 The company proposes delivering improvement to 136 unsatisfactory intermittent discharges (UIDs) to meet NIEA standards during PC21. This includes 13 UIDs which are carrying over from PC15 and 94 UIDs associated with the living with water programme. This represents a significant increase from the anticipated delivery in PC15.

4.54 NIEA has agreed a prioritised list of UIDs for delivery in PC21 with NI Water and the company has submitted a detailed list of schemes in its business plan. However we are aware that a significant number of the drainage area studies that are needed to confirm requirements remain outstanding. The content of the programme and the priority of outputs may change as a consequence of the completion of this work.

4.55 For the final determination we have accepted the number of UID outputs included in the company submission. The profile for delivery has however been changed to reflect the revised profile submitted by the company in its draft determination response. This has brought delivery forward slightly. It therefore goes some way to addressing stakeholder concerns over the 'back end' loading of the profile originally submitted and will help deliver benefits to consumers and the environment sooner than previously anticipated

4.56 The annual targets from the revised delivery profile for PC21 are detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Delivery of improvements to nominated UIDs as part of a defined programme of work	7	21	21	13	25	49

Table 23: Unsatisfactory intermittent discharge outputs for PC21.

4.57 We expect NI Water to continue to engage with NIEA as it completes its drainage area studies and develops solutions for the remainder of its programme to ensure that the final list of outputs and the profile for delivery is reflective of need and agreed environmental priorities.

Nominated improvements to wastewater treatment works

4.58 NI Water plans to deliver improvements at 45 wastewater treatment works with a population equivalent greater than 250 during PC21. These upgrades are required to meet discharge consent standards set by NIEA and to release development constraints. This compares to an expected outturn of 18 for PC15 against a target of 19. Four of the P21 outputs relate to the Living with Water programme and four of the remaining outputs will be delivered using sustainable solutions.

4.59 NIEA has agreed a prioritised list of wastewater treatment works for delivery in PC21 with NI Water and the company has submitted a detailed list of schemes in its business plan. However we are aware that a significant number of the studies and options appraisals that are needed to confirm the requirements and solutions remain outstanding. The content of the programme and the priority of outputs may change as a consequence of the completion of this work.

4.60 For the final determination we have accepted the number of wastewater treatment works outputs included in the company submission. The profile for delivery has however been changed to reflect the revised profile submitted by the company in its draft determination response. On balance this has brought delivery forward, particularly from the last two years of the programme. It therefore helps address stakeholder concerns over the 'back end' loading of the profile originally submitted and will deliver benefits to consumers and the environment and release development constraints sooner than previously anticipated.

4.61 The annual targets from the revised delivery profile for PC21 are detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Delivery of improvements to nominated WwTWs as part of a defined programme of work	0	5	16	3	7	14

Table 24: Wastewater treatment works outputs for PC21.

4.62 We expect NI Water to continue to engage with NIEA as it completes its drainage area studies and develops solutions for the remainder of its programme to ensure that the final list of outputs and the profile for delivery is reflective of need and agreed environmental priorities.

Small wastewater treatment works upgrades

4.63 Our determination allows the company to upgrade 36 wastewater treatment works serving a population equivalent between 20 and 250, as detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Small wastewater treatment works delivered as part of the rural wastewater investment programme	6	6	6	6	6	6

Table 25: Small wastewater treatment works outputs for PC21.

4.64 This reflects the number of outputs included in the company's business plan submission. Three of which it intends to deliver using sustainable solutions. This target number will allow NI Water to address the works that are expected to be non-compliant at the end of PC15 plus some additional works that might become non-compliant during the price control period.

4.65 During our engagement with NI Water prior to the draft determination the company indicated it wanted to increase the number of outputs from 36 to 47. However, in its draft determination response the company confirmed that it accepted the number of outputs included.

4.66 The individual works to be delivered will be agreed and prioritised by NIEA and NI Water through the established rural wastewater investment programme.

CSO and EO discharges at which event and duration monitoring equipment has been installed

4.67 The PC15 target was to install 347 event and duration monitors at Combined Sewer Overflows (CSO) and Emergency Overflows (EO). By the end of PC15 the company expects to have delivered 269, a shortfall of 78. The

company indicates this is primarily because they have installed monitors which are more expensive but provide enhanced functionality. It maintains that they are more useful, particularly from the perspective of hydraulic model validation, because they measure both duration and volume.

4.68 NI Water is proposing installing a total of 744 event duration monitors over the 6 year period of PC21. 646 will be installed at CSO and EO discharge locations in line with criteria agreed with NIEA. The criteria is primarily based on a 2km inclusion radius to shell fish, bathing water and other designated areas. A further 98 will be installed at WwTW where there are discharges which are currently unmonitored.

4.69 We understand that this programme reflects a list of priorities agreed with NIEA and the targets and profile have been accepted on this basis.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of CSO and EO discharges at which event and duration monitoring equipment is installed/fully optimised, and meet NIEA requirements	66	67	117	166	166	162

Table 26: Number of CSO and EO discharges at which event and duration monitoring equipment is installed.

WwTWs upgraded to comply with PPC Regulations

4.70 NI Water has a requirement to ensure the sludge thickening and dewatering facilities operated at their WwTW and WTW are compliant with the Pollution Prevention and Control (Industrial Emissions) Regulations (Northern Ireland) 2013 (PPC). Sixteen PPC upgrades are expected to be delivered in PC15.

4.71 Fifteen WwTWs have been identified as requiring a determination in PC21 to establish whether a PPC permit is required. If this is necessary, the licencing application will be made along with the associated odour surveys and capital improvements. These requirements are agreed in conjunction with NIEA and the outputs have been accepted on this basis. The profile of delivery is summarised in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of qualifying Wastewater Treatment Works delivered as part of the defined programme of improvements to comply with PPC Regulations	0	0	4	3	4	4

Table 27: Number of WWTW upgraded to complying with PPC Regulations.

Impermeable surface water collection area removed from the combined sewerage network

4.72 The company commenced a programme of removing areas of impermeable surface from the combined sewerage network in PC15. We welcome this approach as it has the potential to deliver sustainable improvement of the sewerage network. NI Water's PC15 target was to remove 190,000m^2 and it expects to outperform this by delivering 341,467m^2.

4.73 The company's business plan submission indicates that it intends to remove 218.724 hectares of impermeable surface in PC21. The outputs entered in the business plan tables however equated to 21.724 ha. We queried this with the company and they have confirmed that the submitted figures were out by a factor of 10. We have therefore adjusted the PC21 outputs accordingly as detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Impermeable surface water collection area removed from the combined sewerage network (such as roads and pavements, roofs and hardstandings) (m^2)	364,540	364,540	364,540	364,540	364,540	364,540

Table 28: Impermeable surface water collection area removed from the combined sewerage network.

4.74 The company has stated that its estimated areas for removal within PC21 have a low confidence level as no detailed appraisal of specific locations has been completed. We therefore expect the company to complete any necessary investigations and develop a structured plan for delivery before it commits to any investment.

Number of sustainable WWTW solutions delivered (PE≥250)

4.75 The company plans to deliver sustainable solutions at four wastewater treatment works serving a population equivalent ≥ 250 in PC21. This compares to an expected outturn of five in PC15.

4.76 However, NI Water has indicated that the proposed sustainable solutions such as Aerofac, Phragmifiltre and Nereda are all at pilot stage and could not be fully considered as preferred solutions for the nominated WwTW programme at the time of the submission.

4.77 We would have expected NI Water to have submitted a more defined and considered plan for the delivery of sustainable solutions in PC21 in line with the expectations set out in our PC15 final determination. There is clearly a need for a focus on the assessment of options so that it can identify suitable sites and secure the necessary land to allow further sustainable treatment to be delivered.

4.78 The planned profile for delivery in PC21 is detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of 'sustainable solution' WWTW serving a PE ≥ 250 delivered as part of the defined programme of work for improvements to nominated WWTWs	0	0	0	1	1	2

Table 29: Number of 'sustainable solution' WWTW (PE≥250) delivered.

Number of sustainable WwTW solutions delivered (PE<250)

4.79 The company expects to deliver three sustainable solutions in PC15 in line with its target. It has set a similar target for PC21 but has not yet identified which specific small wastewater treatment upgrades are going to be delivered this way.

4.80 Again we would have expected NI Water to have completed sufficient investigations in PC15 to allow it to submit a more defined and considered plan for the delivery of sustainable solutions at small works in PC21. We expect NI Water to progress this work moving forward.

4.81 The planned profile for delivery in PC21 is detailed in the table below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of 'sustainable solution' WWTW serving a PE < 250	0	0	0	1	1	1

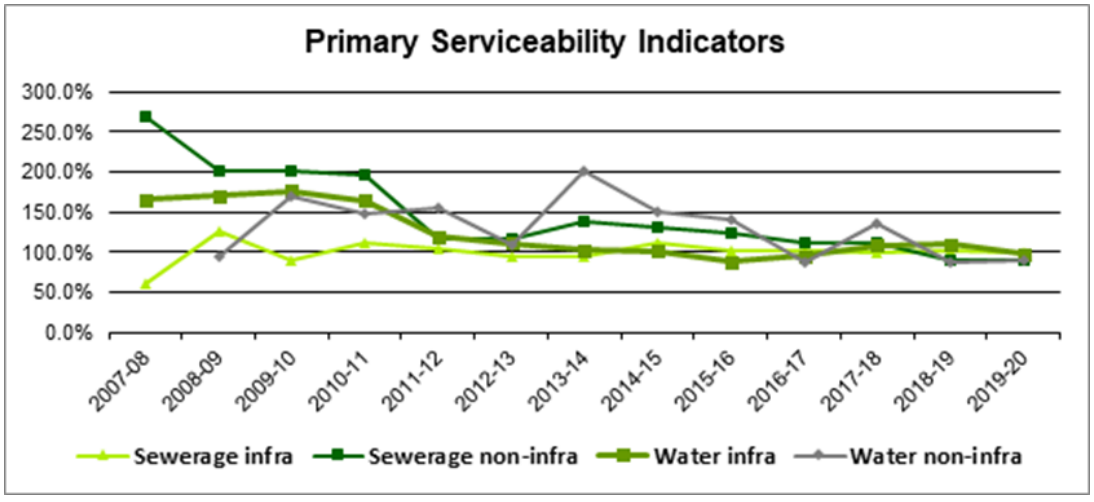
Table 30: Number of 'sustainable solution' WWTW (PE<250) delivered.

5. Serviceability

5.1 We use serviceability to assess whether the capability of the company's assets to provide a service is being maintained. It is a broad measure based on a mix of service indicators, asset performance indicators and sub-threshold indicators which balance consumer experience and the underlying performance of the assets.

5.2 We have undertaken a detailed assessment of the company's performance with respect to serviceability, which is presented in Annex F. This has been updated with latest available performance data for the final determination. Annex F provides additional information on the concept of serviceability and our approach to monitoring it. It also explains how we have derived the individual performance ranges that we will use during PC21 to assess whether the company is maintaining serviceability.

5.3 Our assessment concludes that performance in each sub-service area is currently stable. This aligns with the company's assessment. This is illustrated by the trend in the primary indicators used to assess serviceability in each service area presented Figure 5.1 below.



5.4 Figure 5.1: Trend in performance for serviceability primary indicators

5.5 Stable serviceability is being targeted in each sub-service area throughout PC21, as detailed below. This is in line with the requirements of the department's Social and Environmental Guidance.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Water infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Water non-infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Sewerage infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable
Sewerage non-infrastructure serviceability	Stable	Stable	Stable	Stable	Stable	Stable

Table 31: Serviceability assessment outputs for PC21.

6. Development outputs

Background

6.1 Not all the outputs which NI Water must deliver can be measured against numerical targets in the short to medium term. The work which NI Water undertakes to develop its capability and introduce new techniques is equally important for the long term development of the services it provides to consumers and the cost of those services.

6.2 As a result we introduced development outputs in PC15 to help ensure that the company was able to identify and balance investment priorities and maximise the benefits delivered to consumers. They covered areas where we considered development to be necessary to support NI Water's PC21 business plan submission and requirements that could not necessarily be monitored using numerical targets.

6.3 PC15 included 18 key development objectives which are listed in the table below.

Ref	Description
01	Development of new consumer measures
02	Plan for Asset Maintenance
03	Preservation of Services and Civil Emergency Measures Direction (PSCEMD)
04	ICAT Strategy
05	Water resource management plans and drought plan
06	Sustainable Economic level of Leakage
07	Controlled Reservoir Safety
08	Water mains prioritisation
09	Sustainable Catchment Management
10	Minimising the water quality risk from lead pipes
11	Water meter renewal
12	Targeting sewerage 'hotspots'
13	Polluted Storm Water Overflows
14	Storm water separation
15	Strategic drainage Study
16	Sewer flooding report
17	Sustainable Urban Drainage Systems (SUDS)
18	Implementation of the PPC requirements for Odour Management

Table 32: PC15 development objectives.

6.4 We will report on the delivery of these objectives in our end of period cost and performance report for PC15 once we have reviewed the progress reports submitted by the company in its annual information return for 2020-21.

PC21 Development outputs

6.5 The principle of establishing and reporting on development outputs has also been incorporated into the PC21 process and NI Water proposed a list of 23 outputs which it believes should be categorised in this way. We have also added two objectives related to the implementation for smart metering and scope uncertainty. The development objectives for PC21 are set out in Table 33 below.

Ref	Development Objective	Sub-Prog
01	Consumer Engagement	N/A
02	Consumer Protection / Customer Care Register	N/A
03	NI Water Alpha Ltd - WTWs Treatability Improvements	SP04a
04	DWD Recast & Emerging Issues Study	SP04z
05	Refresh of DG2 Register	SP08z
06	Targeted Mains Renewals in High Leakage Areas	SP08z
07	Leakage Innovation	SP09z
08	Smart Networks – ITS Strategy	SP09z
09	WwPS / CSO Quality (UID) and WwPS (Capacity increase)	SP12b & 12c
10	Event Duration Monitors WwPS/CSOs	SP12b
11	Cranfield Catchment, Kilkeel Storm Separation	SP12g
12	Storm Water Separation	SP12g
13	Real Time Network Modelling	SP12z
14	Urban Drainage Modelling - Live Models for IOC	SP20g
15	Innovation Initiatives	SP20g
16	Urban Drainage Modelling - Studies to Inform PC27 - Top 271 Priority Drainage Areas	SP20g
17	Raw Water Trunk Main Rehabilitation	SP20 & 23c
18	Culmore DA KL554 - Skeoge Link Road	SP24a
19	LWWP Networks	SP12b & 12d
20	LWWP Wastewater Treatment Works	SP16b
21	AD - Asset Strategy - Wastewater Asset Performance Modelling	SP20g
22	AD - Asset Strategy - Water Asset Performance Modelling	SP20g
23	Facilities H&S Compliance	SP20e
24	Smart metering	SP19
25	Addressing scope uncertainty for the Mid-term Review	N/A

Table 33: Development Objectives for PC21.

6.6 The full list of development outputs for PC21 can be found in Annex T of our final determination. This Annex sets out our expectations with regard to delivery, monitoring and reporting against the objectives so that progress and the associated benefits can be assessed.

7. New output measures introduced for PC21

New measures introduced by the UR

7.1 We have introduced two new water service output measures for PC21.

Number of catchments where management plan recommendations have been delivered

7.2 We introduced a PC21 target for delivery of catchment management plan recommendations in recognition of the fact that NI Water will have completed plans for all its 'live' catchments in PC15. The previous PC15 target for the completion of plans is therefore no longer relevant and has been removed.

7.3 At the start of PC21 there will be 23 active catchment management plans in place. The focus for PC21 will therefore be to progress from planning to implementation of solutions to contribute to achieving SCAMP objectives.

7.4 The company plans to deliver a prioritised list of interventions in 20 catchments in PC21. The prioritisation process has considered the water quality and environmental drivers that are appropriate for the interventions being undertaken and that are likely to contribute to achieving SCAMP objectives.

7.5 The company's targets for this work have been accepted.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of catchments where management plan recommendations have been delivered	0	3	4	5	5	3

Table 34: Number of catchments where management plan recommendations have been delivered.

Number of treatability studies completed

7.6 We have introduced this target for PC21 to help ensure that NI Water develops a structured plan for the completion of treatability studies in time to inform water treatment work investment requirements for PC27. We expect this work to be prioritised in conjunction with DWI. The treatability studies for PC21 were issued to DWI late in the process and this has impacted on the ability to come to conclusions on investment for the draft determination.

7.7 The company plans to complete 12 WTW treatability studies to inform PC27 investment requirements as detailed in the table below. This covers around 50% of the total WTW asset base. The company then plans to undertake an

equivalent number of studies in each regulatory period, so that each individual WTW is assessed at least once within any two PC periods.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of treatability studies completed	0	0	0	12	0	0

Table 35: Number of treatability studies completed.

7.8 NI Water will need to ensure that all studies are completed in line with the delivery profile so that the outcomes are available in time to inform its PC27 submission. We also expect it to prioritise the studies in consultation with DWI so that the programme addresses water treatment works that are of greatest priority.

7.9 Our reporting requirements also encourage NI Water to propose additional service measures which better reflect the qualities of service which consumers' value and which are relevant to their needs. This should include the company's assessment of whether there are any gaps between the current list of performance measures and requirements of the social and environmental guidance for the price control period.

New measures proposed by NI Water

7.10 The company proposed two additional sewerage service measures to reflect ongoing work to remove economic constraints due to capacity issues in its wastewater treatment works and networks, as this forms a significant element of the submission for PC21.

Number of Economic Constraint Areas Removed

7.11 Economically constrained areas (ECAs) are priority hub towns that face economic development freeze conditions or severe growth constraints due to inadequate sewerage infrastructure.

7.12 NI Water estimates that there are currently 25 ECAs and it as indicated that it plans to release economic development for 12 of these in PC21.

7.13 The targets and profile submitted by the company have been accepted and are detailed below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of Economic Constraint Areas Removed	0	0	0	2	1	9

Table 36: Number of Economic Constraint Areas Removed.

Number of Serious Development Restrictions Removed

7.14 Serious development restrictions (SDRs) is the term used for other non-hub towns where the sewerage infrastructure (either treatment capacity, network or both) is deemed to be at full capacity

7.15 NI Water estimates that there are currently 91 SDRs and it has indicated that it plans to release constraints for 37 SDRs in PC21.

7.16 The targets and profile confirmed by the company have been accepted and are detailed below.

Output	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Number of Serious Development Restrictions Removed	4	0	0	8	9	16

Table 37: Number of Serious Development Restrictions Removed.

8. PC21 Output Summary

8.1 The summary outputs for PC21 are set out in Table 38 (Consumer service and water quality outputs for PC21) and Table 39 (Sewerage service outputs for PC21) below. These tables include actual performance for 2019-20 as submitted in the company's annual information return to show how the outputs planned for PC21 compare with recent outturn performance.

Line	description	Units	PC15	PC21					
A	**Consumer Service**		2019-20	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
1	DG2 Properties at risk of low pressure removed from the risk register by company action	nr	115	147	145	143	139	137	135
2	DG2 Properties receiving pressure below the reference level at end of year	nr	626	492	427	365	306	250	195
3	DG3 Supply interruptions > 12hrs (unplanned and unwarned)	%	0.088	0.091	0.087	0.084	0.080	0.077	0.073
4	DG3 Supply interruptions (overall performance score)	nr	0.79	0.81	0.79	0.77	0.75	0.72	0.70
5	DG6 % billing contacts dealt with within 5 working days	%	99.97	Not targeted BUT subject to CM/SAT monitoring and review					
6	DG7 % written complaints dealt with within 10 working days	%	99.95	Not targeted BUT subject to CM/SAT monitoring and review					
7	DG8 % metered customers received bill based on a meter reading	%	99.5	99.0	99.0	99.0	99.0	99.0	99.0
8b	Unwanted contacts	nr	67,013	67,000	66,100	65,200	64,300	63,400	62,500
8d	First Point of Contact Resolved (FPOCR)	%	90	84	84	84	84	84	84
8e	Net Promoter Score	nr	42	42	42	42	42	42	42
9	DG9 % Calls not abandoned	%	99.5	Not targeted BUT subject to CM/SAT monitoring and review					
10	DG9 % calls not receiving the engaged tone	%	100.0	Not targeted BUT subject to CM/SAT monitoring and review					
11	Overall Performance Assessment (OPA) score (11 Measures)	nr	246	Not targeted BUT subject to CM/SAT monitoring and review					
12	Total Leakage	Ml/d	161	157	156	154	153	151	150
13	Security of supply index	nr	100	100	100	100	100	100	100
14	Percentage of NI Water's power usage derived from renewable sources	%	44	45	45	50	50	75	100
B	**Quality Water**								
15a	% overall compliance with drinking water regulations	%	99.90	99.83	99.83	99.83	99.83	99.83	99.83
15b	% compliance at consumers tap	%	99.84	99.74	99.74	99.74	99.74	99.74	99.74
16	% iron compliance at consumers tap	%	98.89	98.62	98.62	98.62	98.62	98.62	98.62
17	% Service Reservoirs with coliforms in >5% samples	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C	**Water Outputs**								
18	Water mains activity - Length of new, renewed or relined mains	km	149	139.7	139.7	139.7	139.7	139.7	139.7
19	Completion of nominated trunk main schemes	nr	0	0	2	1	5	2	4
20	Completion of nominated water treatment works schemes	nr	1	1	0	5	4	1	8
21	Completion of nominated improvements to increase the capacity of service reservoirs and clear water tank	nr	1	1	0	0	0	3	0
D	**Serviceability**								
22	Water infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
23	Water non-infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
E	**PC15 Additional Output Measures**								
25	Number of lead communication pipes replaced	nr	1,781	1,844	1,844	1,844	1,844	1,844	1,844
26	Number of school visits	nr	229	176	176	176	176	176	176
27	Number of events	nr	143	57	57	57	57	57	57
F	**PC21 Additional Output Measures**								
29	Number of catchments where management plan recommendations have been delivered	nr	n/c	0	3	4	5	5	3
30	Number of treatability studies completed	nr	n/c	0	0	0	12	0	0

Table 38: Customer service and water quality outputs for PC21.

Line	description	Units	PC15	PC21					
A	**Consumer Service Sewerage**		2019-20	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
1	DG5 Properties at risk of flooding - number removed from the 2 in 10, 1 in 10 and 1 in 20 risk register by company action	nr	1	0	0	20	6	10	21
2	DG5 Properties on the 2 in 10, 1 in 10 and 1 in 20 risk register at the end of the year	nr	119	120	123	106	103	96	78
B	**Quality Sewerage**								
3	% of WwTWs discharges compliant with numeric consents	%	94.90	92.05	91.63	92.33	93.26	93.72	94.14
4	% of total p.e. served by WwTWs compliant with numeric consents	%	99.50	99.18	94.65	94.65	95.71	95.72	95.77
5	Small WwTW compliance (works greater than or equal to 20p.e. but less than 250p.e.)	%	89.29	90.76	91.09	93.07	95.05	97.03	99.01
6	Number of high and medium pollution incidents attributable to NI Water	nr	13	12	11	10	9	8	7
C	**Sewerage Outputs**								
7	Sewerage activity - Length of sewers replaced or renovated	km	18.5	10.1	10.1	10.1	10.1	10.1	10.1
8	Delivery of improvements to nominated UIDs as part of a defined programme of work	nr	3	7	21	21	13	25	49
9	Delivery of improvements to nominated WwTWs as part of a defined programme of work	nr	2	0	5	16	3	7	14
10	Small wastewater treatment works delivered as part of the rural wastewater investment programme	nr	9	6	6	6	6	6	6
D	**Serviceability**								
11	Sewerage infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
12	Sewerage non-infrastructure serviceability	Text	Stable	Stable	Stable	Stable	Stable	Stable	Stable
E	**PC15 Additional Output Measures**								
13	Number of CSO and EO discharges at which event and duration monitoring equipment is installed/fully optimised, and meet NIEA requirments	nr	37	66	67	117	166	166	162
14	Number of qualifying Wastewater Treatment Works delivered as part of the defined programme of improvements to comply with PPC Regulations	nr	7	0	0	4	3	4	4
15	Impermeable surface water collection area removed from the combined sewerage network (such as roads and pavements, roofs and hardstandings)	m2	59,586	364,540	364,540	364,540	364,540	364,540	364,540
16	Number of 'sustainable solution' WWTW serving a PE ≥ 250 delivered as part of the defined programme of work for improvements to nominated WWTWs	nr	0	0	0	0	1	1	2
17	Number of 'sustainable solution' WWTW serving a PE < 250	nr	0	0	0	0	1	1	1
F	**PC21 Additional Sewerage Output Measures**								
18	Number of Economic Constraint Areas Removed	nr	n/c	0	0	0	2	1	9
19	Number of Serious Development Restrictions Removed	nr	n/c	4	0	0	8	9	16

Table 39: Sewerage service outputs for PC21.