

Water & Sewerage Services Price Control 2021-27

Final Determination – Annex I Capital Investment May 2021





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1. Introduction

- 1.1 This Annex to the PC21 draft determination sets out the Utility Regulator's assessment of the capital investment proposed by NI Water for the PC21 period.
- 1.2 The provision of water and sewerage services is a capital-intensive business. The network of water mains and sewers extends to 27,000 km and 16,200 km respectively. Water resources, water treatment works, pumping plant and wastewater treatment works require substantial structures, mechanical and electrical plant and instrumentation.
- 1.3 The company must invest to maintain and enhance its assets to maintain and improvement service, support development and secure drinking water quality and environmental compliance.
- 1.4 In PC15 the programme of work proposed by the company was constrained by the indicative public expenditure budget stated in the Social and Environmental Guidance issued by Dfl to the Utility Regulator under Article 7 of the Water and Sewerage Services (Northern Ireland) Order 2006.
- 1.5 For PC21 the guidance did not state an indicative budget. Instead, it asked the company to "formulate a deliverable investment plan which meets established needs and is affordable from a tariff perspective". NI Water prepared and submitted its Business Plan on this basis. The company's plan included capital investment of £2,258m in nominal terms, equivalent to £1,907m in 2018-19 prices which we use as a common price base to assess the Business Plan and make comparisons on a consistent basis. The company's plan assumed nominal investment of in the Living with Water Programme (£455m in 2018-19 prices) would be grant funded and not recovered through tariffs. Capital investment in PC15 was £953m in nominal terms (£971m in 2018-19 prices). NI Water's planned investment in PC21 was 87% greater than expenditure in PC15 when compared on a consistent price base.
- 1.6 As part of its response to the draft determination, the company provided updated estimates for the PC21 capital programme. Following a review of these changes and further updates provided by the company to take account of an updated estimate PC15 outturn and PC15 carry over at April 2021, our final determination for PC21 is based on an revised investment plan of £1,926m in 2018-19 prices.
- 1.7 The key challenge of the Business Plan is the increased level of capital investment necessary to address a lack of capacity in the sewerage network which constrains development. The need to address this issue is recognised



by the quality regulators, the Consumer Council and Dfl as a key driver for increased investment in PC21.

- 1.8 The plan does not meet all identified needs as this would not be achievable within a target of zero price limits or deliverable within PC21. The company therefore expects that level of investment in PC21 will continue for at least two subsequent price controls to address issues with the capacity of the sewerage network.
- 1.9 The company's Business Plan was presented as a detailed list of subprogrammes and projects including costings, service and purpose allocation and key project milestones. Supporting information of varying degrees of detail were provided in outline Business Cases.
- 1.10 We used a range of top down and bottom up approaches to challenge the Business Plan including:
 - A top down econometric assessment of capital maintenance investment using data from comparator companies in England & Wales. A further allowance was included for consequential capital maintenance due to the increased size of the capital programme.
 - A comparison between historical unit costs of delivery and run rates of expenditure for items of work which continue from PC15 into PC21.
 We expect costs to remain the same or reduce for similar work unless a robust explanation for the increase is provided.
 - c) A review and challenge of the scope of works or the quantity of activities included in the costings.
 - d) An assessment of the company costing systems undertaken by the Reporter and updated for the final determination.
 - e) Adjustments to some of the company's allocation of investment by purpose (enhancement / base) and by service. This included a systematic reallocation from infrastructure investment to non-infrastructure investment for service reservoir rehabilitation, metering and ICT.
 - f) Adjustments to the application of efficiency to take account of reprofiling of the capital programme.

The outcome of our analysis is summarised in the table below. NI Water's Business Plan included capital investment of £1,907m in 2018-19 prices before the deduction of grants and contributions. The company's response to the draft determination increased the estimated cost of investment in PC21 to £1,926m in 2018-19 prices. We have concluded that the revised



outputs can be delivered for $\pm 1,820$ m, a reduction of ± 106 m (5.5%) against the revised baseline.

	Investment £m 2018-19 prices			
	NI Water revised Submission	UR final determination	Difference	
Capital maintenance	763	715	-48	
Enhancement expenditure	1163	1105	-58	
Gross capital investment	1926	1820	-106	
Grants and contributions (excluding LWWP)	-72	-72	0	
Total investment net of contributions	1853	1747	-106	

Table 1.1: PC21 capex determination summary

- 1.11 Notwithstanding the guidance provided by the Department through the Social and Environmental Guidance, it remains the case that NI Water is subject to public expenditure constraints. There is therefore no guarantee that the full capital budget necessary to deliver the plan will be made available in current financial circumstances and in light of other significant demands on the public purse.
- 1.12 Our assessment of the capital programme is presented in the following sections. These sections follow the key steps in our analysis. We have analysed and reported investment in real terms (adjusted for inflation) using a common price base of 2018-19 prices.

Section 2	Capital Budget
Section 3	Capital Inflation
Section 4	Capital Efficiency
Section 5	Capital Maintenance Investment
Section 6	Individual Sub-programmes of Work





2. Amended Capital Investment Plan for PC21

- 2.1 In its original Business Plan for PC21 NI Water identified a capital budget of £1,907m in 2018-19 prices.
- 2.2 In response to the draft determination, the company made a number of changes to the capital budget. In its revised estimates, the company:
 - accepted some of the adjustments made in the Utility Regulator's PC21 draft determination;
 - b) re-profiled the investment programme, reducing investment in the early years of PC21 and increasing investment in the later years;
 - c) updated estimates of expenditure for specific PC15 carry over projects based on its latest project estimates, increasing the level of carry-over to PC21;
 - added further carry-over into PC21 from PC15 including further delays in PC15 delivery and a number of additional projects which should have been included in the Business Plan submission.
- 2.3 In its response to the PC21 draft determination (Annex 5.20) the company provided a revised estimate of £1,928m capital investment to deliver its Business Plan. The company provided a further update to these estimates in April 2021. Following a review of these updated estimates, we identified a revised baseline programme for PC21 of £1,926m. The basis of this assessment was shared with the company in advance of the final determination and is summarised in Table 2.1 below. The PC15 additional outputs have been allocated to the following categories:
 - a) Additional carry over to deliver PC15 outputs. The additional expenditure has been included in the determination and the equivalent enhancement expenditure logged down.
 - Additional outputs in PC21 not included in the initial business plan submission. The additional expenditure has been included in the determination.
 - c) Additional base maintenance carry over. This covers 100% base maintenance investment projects carried over from PC15. Since the base maintenance in PC21 is based on an econometric assessment subject to specific consequential base adjustments, no additional allowance has been included for base maintenance projects from PC15.



d) Spin-off from PC21 projects. This represents investment to deliver outputs included in the original business plan submission which have already been developed as individual projects. Since this investment is already included in the business plan, no further additional investment has been included.

	Business Plan Submission	Draft determination response	April 2021 Update	Baseline programme
PC21 Outputs	1858	1834	1834	1834
PC15 Carryover 49		58	65	65
PC15 Additional carry-	over	36	46	28
PC15 projects			4	4
Additional outp	outs		24	24
Base maintena carryover	ance		12	0
Spin-off from PC21 projects			7	0
Total	1907	1928	1945	1926

Table 2.1: Amended capital investment plan for PC21 (2018-19 pricespost efficiency)





3. Capital Budget

Public expenditure capital budget

- 3.1 The final determination includes a gross capital budget of £1,820m in 2018-19 prices. This is equivalent to £1991m in nominal terms.
- 3.2 Public expenditure capital budget is stated in nominal terms and includes adjustments to the gross capital budget to account for:
 - Accounting allocations in respect of the Public Private Partnership (PPP) schemes which treat water and wastewater and dispose of sewage sludge under concession arrangements with NI Water; and,
 - The capital grants and contributions which NI Water receives in respect of infrastructure charges for new connections.

PPP and IFRS adjustments

3.3 We have accepted the adjustments set out by NI Water for Alpha PPP maintenance, the residual interest in off balance-sheet PPP and the IFRS infrastructure renewals charge adjustment.

Capital grants and contributions

- 3.4 The company receives capital grants and contributions in respect of new connections including: infrastructure connection charges; connection costs, reasonable cost contributions for requisition and sewer adoption income. These grants and contributions provide a source of income to part fund the associated capital works.
- 3.5 We have reviewed the company's estimates of capital grants and contributions for PC21 and concluded that they were reasonable. Where appropriate these estimates:
 - Were based on the level of development and new connections which were used by the company to estimate the capital costs of new development and connections.
 - Reflected recent run rates of grants and contributions amended for estimated rates of future development.
- 3.6 The capital grants and contributions included in the Business Plan and the draft determination are summarised in Table 3.1.



Source of grants and contributions	£m in PC21
Capital grants and contributions (EU Interreg fund)	0.5
Infrastructure charges	28.1
Other contributions.	43.6
Total	72.2

Table 3.1: Projected grants and contributions in PC21 (2018-19 prices).

3.7 In addition to the capital grants and contributions shown above, the company's Business Plan submission assumed that the capital expenditure linked to Living with Water Programme investment of £455m would be funded by a grant from government. We have determined that the LWWP investment in PC21 can be delivered within a weighted average charge increase of zero. As a result, we concluded that it is not necessary for LWWP investment to be off-set by grant funding in PC21. It is possible that future investment in subsequent price controls cannot be delivered within stable prices and it is likely that it will be necessary to make a case for grant funding to off-set part of the capital programme in the future.

Equivalent public expenditure budget for PC21

3.8 The equivalent public expenditure capital budget for the PC21 final determination is set out in Table 3.2.

	21-22	22-23	23-24	24-25	25-26	26-27	PC21
PE capital budget used	178.6	251.2	327.3	438.2	449.4	405.7	2050.5
Alpha PPP maintenance	-2.9	-3.0	-1.1	-1.2	-1.2	-1.6	-11.1
Residual interest in off balance-sheet PPP	-4.1	-4.2	-4.3	-4.3	-4.2	-4.3	-25.5
Capital grants and contributions	13.2	13.3	13.3	13.7	14.0	14.4	82.0
Capital grants and contributions transferred to deferred credits	-1.5	-1.6	-1.6	-1.6	-1.6	-1.7	-9.6
NI Water gross capital budget	183.2	255.7	333.6	444.8	456.4	412.5	2086.4

 Table 3.2: Public expenditure budget reconciliation (£m nominal).



4. Capital Inflation

Introduction

- 4.1 NI Water's capital investment is predominantly funded through public expenditure budgets which are set in nominal terms. The outputs which can be delivered will be affected by inflation which will reduce the real purchasing power of the budget.
- 4.2 In our PC15 determination process we considered a range of options for projecting capital inflation in the medium term and for monitoring delivery of the capital programme. Following a consultation exercise we concluded that we should adopt RPI as the basis for estimating and adjusting for capital inflation over PC15. We believe that RPI remains the most suitable inflation indicator for projecting capital expenditure and so have continued to use it for PC21.
- 4.3 In our information requirements for PC21 we asked NI Water to submit the estimates of annual inflation that it had used to convert capital investment between nominal prices and real prices at the 2018-19 baseline. For the final determination, we have used updated RPI inflation forecasts published by the Office of Budget Responsibility (OBR) in March 2021. This reflects the reduction in inflation through the COVID19 lockdowns and a return to more typical rates of inflation in the future as the economy recovers.

RPI year average	Base Year 18-19	21-22	22-23	23-24	24-25	25-26	26-27
NIW Business Plan submission	283.308	308.892	318.159	327.703	337.534	347.661	358.090
PC21 Final determination	283.308	302.016	308.354	315.922	324.907	334.540	344.576

Table 4.1: RPI indices used to model capital inflation in thedetermination.

- 4.4 In broad terms, the reduction in inflation reduces the nominal expenditure required to deliver the same outputs by 3.5%.
- 4.5 We will monitor delivery in PC21 using RPI to deflate nominal capital costs. We will adjust the RCV at the end of PC21 using RPI to create an opening balance for PC27.



5. Capital Efficiency

Reporter capex challenge

5.1 Following an assessment of the company's Business Plan the Reporter highlighted some issues in respect of capex estimates with the most material relating to the Tender Outturn Risk adjustment. The Reporter summarised the impact of the issues identified by providing a range of cost impact and confidence levels. Base on this information, our draft determination included a general adjustment to pre-efficiency costs to reflect the uncertainty attached to the Tender Outturn Risk adjustment. In response to the draft determination, the company challenged this adjustment and we asked the Reporter to undertake a further audit of the costing systems and the additional work undertaken by the company to develop its response to the draft determination. Following this additional work the Reporter revisited and revised his initial opinion, removing much of the range of potential adjustments and identifying a single point adjustment to the company's preefficiency capex estimates of £9m. This adjustment has been included in the final determination.

Capital efficiency

- 5.2 NI Water's Business Plan included an assessment of capital efficiency for PC21 which considered a range of process and procurement opportunities. The aggregate outcome was an efficiency challenge rising from 1.8% in 2021-22 to 9.1% in 2026-27.
- 5.3 Our initial assessment of efficiencies for PC21 concluded the approaches we had used in the past to assess efficiency of enhancement expenditure were no longer available to us. We therefore focused on bottom up challenge of costing systems through the Reporter audit, scope challenge and the assessment of historical unit rates and unit costs to establish an efficient cost baseline for PC21.
- 5.4 We expect all regulated companies to deliver on-going efficiencies which reflect improvements in general productivity in the economy. Our assessment of productivity improvements are included in the calculation of the capex frontier shift which is described in Annex K. Our assessment of frontier shift is shown on Figure 5.1, where it is compared to the efficiency adjustments proposed by the company. The company's proposals go further than the frontier shift.



Utility Regulator

Figure 5.1: PC21 capex efficiency profile

- 5.5 Taking account of the Reporter's audit of the company's efficiency proposals and the scale of efficiency proposed by the company relative to the frontier shift, we have accepted the level of efficiency proposed by the company for PC21. This has been applied to our determination of pre-efficiency costs which take account of the challenges described above.
- 5.6 In its response to the draft determination, the company provided an updated capital investment profile. This update was based on the post-efficiency capital expenditure in the company's business plan submission with a net delay to investment to allow more time to develop and procure efficient solutions. For the final determination, we have adjusted determined costs of these schemes to reflect the higher levels of efficiency the company plans to achieve in the later stages of the PC21 programme.





6. Capital Maintenance Investment

NI Water's estimate of capital maintenance investment

- 6.1 Capital maintenance expenditure is the investment necessary to maintain the serviceability of the existing assets and the level of service the company delivers to consumers. It is an on-going expense which is included in the determined revenue and paid for by today's consumers through charges including subsidy in lieu of domestic charges.
- 6.2 NI Water's Business Plan included £763.1m of capital maintenance investment in 2018-19 prices. This represents 40% of the total investment of £1,907.6m proposed by the company.
- 6.3 In our approach to asset maintenance planning for PC21, we identified a range of techniques which are typically used to assess medium to long term asset maintenance needs:

Top down expenditure analysis

- a) The projection of historical expenditure;
- b) Econometric analysis of expenditure by other companies; and
- c) Depreciation approach based on modern equivalent asset valuation.

Asset maintenance outcomes

- d) Assessment of historical serviceability trends; and
- e) Historical assessment of condition and performance.

Asset maintenance plans

- f) Specific asset maintenance plans identifying outputs and expenditure; and
- g) Forward looking risk based approach which takes account of how asset serviceability deteriorates over time and analyses the cost of running or replacing the asset to drive a cost effective or cost beneficial asset management plan.
- 6.4 In its business plan, submission the company has made use of:
 - a) Bottom up cost assessments.
 - Run rate of historical expenditure for activities which will continue in PC21 at or about the same level of investment.



Utility Regulator

6.5 While we welcome the development of bottom up risk based methodologies to assess capital maintenance we have concluded that further work is required to have confidence in the outcome of this approach which continues to be subject to management adjustments. As a result, we have continued to use top down techniques to determine capital maintenance investment.

Utility Regulator's assessment of capital maintenance investment

- 6.6 We have adopted the following approach to determining capital maintenance investment in the absence of a strong case to support the level of increased investment identified by the company:
 - a) We have reviewed recent trends in serviceability;
 - b) We have reviewed recent trends in capital maintenance investment;
 - We have completed an econometric assessment of capital maintenance investment, expanding the range of techniques employed to allow us to triangulate to a reasonable determination;
 - We have determined an allowance for consequential base maintenance in light of the increase in the overall capital programme. This will ensure that investment in maintenance which is driven by enhancement expenditure does not distract from general maintenance of the assets driven by need.
 - e) We have applied an allowance for growth of the asset base and an on-going efficiency adjustment over the PC21 period.
 - f) Finally we used the detailed challenge to individual sub-programmes to prepare a bottom up estimate of base maintenance and compared this with our top-down assessment.

Serviceability trends

6.7 Serviceability is the capability of an asset to provide a service. 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. Focusing asset maintenance planning on serviceability, rather than the condition or performance of the assets, will ensure that investment targets consumer outcomes in the short term and the



right level of capital maintenance investment is maintained in the medium and long term.

6.8 Annex F describes our approach to serviceability and provides our assessment of serviceability for PC15. We have concluded that the current trend in serviceability is stable following improvements driven by investment over the last decade (see Figure 6.1).



Figure 6.1: Primary serviceability indicators.

6.9 Because serviceability is stable at present, it is reasonable to assume that capital maintenance investment in the recent past has been adequate for the current asset base. That is not to say that an increase in investment will not be necessary in the future. But it does indicate that a significant stepped increase in investment to maintain the company's existing assets is not warranted.

Assessment of historical spend

Historical capital maintenance investment from 2007-08 is shown in Figure 6.2. The data has been updated to 2018-19 prices using RPI with a notional adjustment of -0.6% to reflect the long term frontier shift of real price effects and on-going productivity over the long term.







Figure 6.2: Capital maintenance investment trends (£m 2012-13 prices).

6.10 During the three year Strategic Business Plan period 2007-10, the company allocated some investment to enhancement as 'backlog base maintenance' to improve the assets and catch up on under-investment in previous years. Average investment in real terms over various periods is set out in Table 6.1.

Price Control	Duration		£m		
SBP	3 years	2007-10	98.4		
PC10	3 years	2011-13	96.7		
PC13	2 years	2013-15	96.2		
PC15 5 years to date		2015-20	95.9		
Long term average 2007-20 96.7					
Note: average costs in 2018-19 prices excluding backlog base maintenance in the SBP period					

Table 6.1: Average capital maintenance investment (£m 2018-19prices).

- 6.11 We do not draw any strong conclusion from the fluctuation in investment between years or between price control periods. The fluctuation between years is driven by investment decisions within annual budget limits.
- 6.12 The average rate of capital maintenance has remained broadly consistent in real terms over the medium term. Our broad conclusion is that serviceability has been maintained at an average level of investment of £96.7m per annum.



Econometric assessment of capital maintenance

- 6.13 Our determination of capital maintenance expenditure is underpinned by econometric comparison with water and sewerage companies in England and Wales. This work is described in Annex L. We have used the average of the various model costs to establish a benchmark costs for water and sewerage services.
- 6.14 The detailed econometric assessment set out in Annex L reflects the division of water industry costs by Ofwat into wholesale and retail and the analysis covers wholesale assets only. NI Water remains an integrated provider and includes retail assets. We have used a simple regression of cost from comparator companies in England & Wales using average billed customer numbers as a driver to establish a capital maintenance allowance for retail costs.
- 6.15 The central estimate and upper quartile cost for NI Water produced by this analysis is summarised in Table 6.2.

Service	Central estimate £m	UQ £m
Wholesale sewerage	51.5	48.7
Wholesale water	46.8	40.3
Retail	2.7	2.7
Total	101.0	91.7

Table 6.2: Econometric benchmark capital maintenance costs (2018-19 prices)

- 6.16 In the first five years of PC15, NI Water has invested an average of £96.5m in capital maintenance, operating between our central and upper quartile estimate. At the same time, serviceability has been maintained.
- 6.17 Our determination for PC21 asks NI Water to close 80% of the gap to the upper quartile estimate by improving the efficiency of its capital maintenance activities. This requires the company to reduce its costs by £3.8m by the end of PC21.

Consequential capital maintenance

6.18 The concept of "consequential capital maintenance" refers to additional maintenance expenditure which might result from enhancement investment. For example, where the improvements to deliver a new standard make it necessary to replace an asset with some residual life, or it is considered economic to bring forward asset replacement within a single contract to reduce the number of contracts carried out on a site.



6.19 In the past, when we have used econometric comparison to determine capital maintenance expenditure we have not taken account of consequential capital maintenance. The comparator companies we use in our analysis also incur consequential capital maintenance which is included in the benchmark costs. Therefore, there should be no reason to adjust for consequential capital maintenance for any specific company.

Utility Regulator

- 6.20 However, there has been a material increase in the capital programme for PC21. We have considered whether this might drive consequential capital maintenance and, if it does, how this might be included in the determination.
- 6.21 Figure 6.3 shows the relationship between asset maintenance expenditure and the number of consumers for the England & Wales water and sewerage companies which we use to benchmark NI Water's costs. There is a correlation between capital maintenance expenditure and the size of the companies. The scatter of individual annual data reflects management decisions on application of investment in individual years. The data averaged over an 8 year period emphasises the relationship.



Figure 6.3: Capital maintenance expenditure of England and Wales WASCs relative to billed customers.

6.22 Figure 6.4 shows the relationship between capital maintenance expenditure and capital enhancement expenditure for the same companies and includes data for NI Water. The PC21 data point reflects the benchmark level of capital maintenance.



Maintenance v enhancement capex



Figure 6.4: Maintenance capex of England & Wales WASCs relative to enhancement expenditure.

- 6.23 The data demonstrates that NI Water is an outlier in PC21 in respect of the scale of the capital programme when compared with the companies we use to determine a benchmark level of capital maintenance.
- 6.24 The parameters we use in the econometric assessment of capital maintenance reflects the scale of the company including number of consumers and quantity of assets and does not include the level of capital investment. This is reasonable in that capital maintenance will relate to the scale of the assets rather than the level of investment today. However, it is also true that the analysis cannot test the concept of consequential capital maintenance associated with the material increase in enhancement expenditure by NI Water in PC21. The close correlation between the scale of investment and the size of the comparator companies means that any level of consequential capital maintenance is already explained by the size of the company.
- 6.25 In the case of NI Water, we recognise that the increased capital investment in PC21 is associated with an increase in the number of relatively large enhancement projects in sewerage, wastewater and trunk mains. Without these projects, the company's capital programme would be proportionate to the scale of capital investment of the comparator companies and it would not be necessary to consider consequential capital maintenance. However, the company has identified capital maintenance associated with these larger enhancement projects. To set a benchmark rate of capital maintenance only would require the company to fund the capital maintenance on these large enhancement projects by diverting funds from other essential maintenance



works. We therefore consider it appropriate to allow an additional sum to cover the capital maintenance associated with these major enhancement projects which will be added to the benchmark level of capital maintenance. Separating out these projects leaves a general programme of work which is proportionate to that carried out by other comparator companies which is adequately covered by the benchmarked capital maintenance.

- 6.26 In its response to the draft determination, the company welcomed our approach to the determination of consequential base maintenance but challenged the allowance included in the determination. We have therefore reviewed the assessment of consequential base maintenance for the final determination. As a result, we have increased the allowance for consequential base maintenance in areas of capitalised salaries and on-costs, capital maintenance (sewerage) and management and general as described below.
- 6.27 We determined a reasonable sum for consequential capital maintenance by inspection of the company's capital programme, identifying sub-programmes of work where there was a major increase in capital maintenance expenditure since PC15, particularly those with increased enhancement activities. The programmes considered in this analysis and our allocation to consequential capital maintenance is summarised in the following tables:
 - Table 6.3: Total capital investment considered in the consequential capital maintenance assessment identifies the sub-programmes considered in our analysis and identifies the increase in total expenditure.
 - Table 6.4: Capital maintenance investment considered in the consequential capital maintenance assessment identifies the increase in capital maintenance in these sub-programmes and the consequential base maintenance allowance included in the draft determination.

		Total capital investment £m			
		PC15	PC21	Increase	
	Business Plan submission	962.6	1907.6	944.9	
00	Capitalised salaries and on-costs	83.8	121.8	38.0	
01	Capital maintenance (water)	44.0	70.9	26.9	
02	Capital maintenance (sewerage)	136.7	180.3	43.6	
05	Water trunk mains	13.0	50.6	37.6	
12	Sewerage programme	120.9	220.4	99.5	
12	Sewerage programme (LWWP)	1.1	182.8	181.7	
16	Wastewater treatment	81.3	208.5	127.2	
16	Wastewater treatment (LWWP)	4.8	266.4	261.6	
20	Management & General	75.4	167.7	92.3	
	Sub-programme total	561.0	1469.3	908.3	

Table 6.3: Total capital investment considered in the consequentialcapital maintenance assessment

6.28 The selected sub-programmes considered in this analysis explain 96% of the increased expenditure in PC21 compared to PC15.

		Total capital investment £m			
		PC15	PC21	Increase	ССМ
	Business Plan submission	553.7	763.1	209.4	
00	Capitalised salaries and on- costs	47.9	61.1	13.2	9.9
01	Capital maintenance (water)	31.3	60.4	29.0	14.5
02	Capital maintenance (sewerage)	128.3	143.9	15.6	13.2
05	Water trunk mains	3.0	7.9	4.8	4.8
12	Sewerage programme	51.6	57.4	5.9	5.9
12	Sewerage programme (LWWP)	0.0	16.9	16.9	16.9
16	Wastewater treatment	21.7	40.1	18.4	18.4
16	Wastewater treatment (LWWP)	0.7	47.2	46.5	46.5
20	Management & General	59.6	95.6	36.0	10.9
	Sub-programme total	344.2	542.4	186.3	141.0

Table 6.4: Capital maintenance investment considered in the consequential capital maintenance assessment

- 6.29 Further commentary on the individual sub-programme adjustments is included below:
 - Capitalised salaries and on-costs. This was amended for the final determination. We have allowed 75% of the increased cost identified by the company. This is in line with our determination of increased staffing levels and the adjustment made to PC21 pre-efficiency unit costs of staff to reflect PC15 unit costs.
 - Capital maintenance (water). No changes were made for the final determination. In principle, it is for the company to determine the allocation of general capital maintenance investment and we would expect changes in the allocation of capital maintenance between individual sub-programmes between price controls. However, we recognise the work that has been undertaken by the company through its DRRM modelling to establish capital maintenance need and the need to secure compliance at water treatment works. While the DRRM modelling is not yet secure, we have allowed 50% of the capital maintenance increase identified by the company as consequential capital.



- Capital maintenance (sewerage). Much of the increase in capital maintenance expenditure relates to £33m linked to mature compliance investment. In its response to the draft determination, the company provided an outline programme of work and costings which will be implemented under a development objective. It also identified a base enhancement split for the work. We have allocated 40% of the £33m mature compliance investment to base maintenance and included this as an additional consequential base maintenance allowance.
- Water trunk mains. No changes have been made for the final determination. The stepped increase in trunk mains work to improve supply resilience comes with an increased level of capital maintenance which we have included as consequential capital.
- The sewerage and wastewater treatment programmes see the largest increases in expenditure in PC21 as the company seeks to address capacity issues which are the cause of development constraints. The associated increase in capital maintenance has been included as consequential capital maintenance.
- Management & General. This was amended for the final determination to include an allowance for consequential base maintenance for health and safety upgrades, drainage area studies to inform PC27 and work on historic estates. The company included a stepped increase in management and general expenditure in PC21 with associated an increase in capital maintenance. In principle, the capital maintenance activities included in the company's assessment are to maintain its existing assets and facilities, something which is common to the comparator companies used in our econometric benchmarking. Since these activities are adequately covered in the benchmarking no further allowance should be necessary. However, having considered the company's representations, we have concluded that it is appropriate to make some allowance for health and safety upgrades, drainage area studies to inform PC27 and work on historic estates. We have allowed 50% of the costs identified by the company in these areas, striking a balance between the need identified and the fact that companies used in our benchmarking will have some capital maintenance investment in these areas.

Adjustment for growth and on-going efficiency

6.30 Because we have included an upper quartile estimate in our triangulation of capital maintenance expenditure, we have not applied any further catch-up efficiency



6.31 The benchmark costs are assessed on historical costs. It is reasonable to assume that the continuing increase of the network will increase costs in the future. We also expect the company to deliver an on-going efficiency for PC21 which is represented by the capex frontier shift identified in Annex K.

Utility Regulator

- 6.32 We have used a comparative analysis of the capital maintenance costs of GB companies against number of billed consumers to establish a scaling factor for capital maintenance costs in PC21 as shown in Figure 6.3 above.
- 6.33 Applying this scaling to the benchmarked 2018-19 costs would result in a 5% increase in the PC21 period. However, when the frontier shift is applied, this reduces to an average increase over PC21 of 1.2%.

Summary assessment of capital maintenance.

6.34 Our assessment of capital maintenance is summarised below:

	£m/a
NI Water current capital maintenance expenditure	96.5
Upper quartile econometric estimate	91.7
Target cost at the end of PC21 after closing 80% of the gap to UQ	92.7
Average expenditure over PC21 (average current and target)	94.6
Adjusted for growth net of frontier shift (+1.2%)	95.7
Add consequential capital maintenance allowance	23.5
Determined average capital maintenance for PC21	119.2

Table 6.5: Draft determination of capital maintenance expenditure

Alternative Botex approach

- 6.35 In its Business Plan NI Water express concern about the use of econometric comparison with England and Wales water and sewerage companies to determine base maintenance given that companies are regulated on the basis of total spend. In this regime companies are incentivised to identify the best mix of capital maintenance and operational expenditure (botex) to minimise overall costs. This could result in some companies accepting higher operational costs to reduce capital maintenance expenditure while others might increase capital maintenance expenditure to reduce operational costs. The company was concerned that this might distort our econometric comparison of capital maintenance costs which is only one part of the overall cost base.
- 6.36 To address this we commissioned an economic comparison of total capital



maintenance and operating costs as part of our overall econometric assessment. The results of this analysis are reported in Annex L. There was a close comparison of the econometric botex models and the separate opex and capital maintenance models. Our consultant concluded that *the similarity in average predicted costs between the two approaches is sufficient to support the conclusion that the disaggregated opex and capital maintenance models are consistent with the botex model results.*

Utility Regulator

6.37 Our conclusion is that NI Water has sufficient funds in the determined opex and capital maintenance to continue to deliver. However, we would welcome any proposals from the company to change the mix of capital maintenance and operational expenditure in a way which would reduce overall costs while delivering the same or improved service to consumers.





7. Individual Programmes of Work

Introduction

- 7.1 In this section we provide a more detailed commentary on the programme and the level of investment proposed by NI Water for PC21.
- 7.2 Our assessment of the programme is presented by sub-programme. These sub-programmes provide a practical sub-division of the overall investment plan based on similar types of assets, the purpose of the investment and NI Water's management of the programme. It provides an aid for understanding.

Our approach to assessing capital cost estimates

- 7.3 We have used a range of top down and bottom up approaches to challenge the Business Plan and assess whether it has been reasonably costed. We:
 - Undertook an econometric assessment of capital maintenance expenditure described above, benchmarking the costs proposed by the company against water and sewerage service providers in England & Wales.
 - Reviewed and challenged the scope of works proposed by the company for individual projects to determine whether it was reasonable.
 - Used historical run-rates and historical unit rates of investment in PC15 to benchmark run rates and unit rates included in PC21.
 - Commissioned an audit by the independent Reporter of the Business Plan including the capital programme.
- 7.4 We also made some adjustments to the company's allocation of investment by purpose (enhancement / base) and by service. This included a systematic reallocation from infrastructure investment to non-infrastructure investment for service reservoir rehabilitation, metering and ICT.
- 7.5 Following an assessment of the company's Business Plan the Reporter highlighted some issues in respect of capex estimates with the most material relating to the Tender Outturn Risk adjustment. The Reporter summarised the impact of the issues identified by providing a range of cost impact and confidence levels. Based on this information, our draft determination included a general adjustment to pre-efficiency costs to reflect the uncertainty attached to the Tender Outturn Risk adjustment. This was only applied in cases where we had not undertaken specific assessments on



projects or programmes of work. Where our draft determination cost assessments were based on historic run rates of expenditure, or historic unit costs applied to projected activity levels, it was not applied.

- 7.6 In response to the draft determination, the company challenged this adjustment and we asked the Reporter to undertake a further audit of the costing systems and the additional work undertaken by the company to develop its response to the draft determination. Following this additional work the Reporter revisited and revised his initial opinion, removing much of the range of potential adjustments and identifying a single point adjustment to the company's pre-efficiency capex estimates of £9m. This adjustment has been used in the final determination instead of the generic percentage adjustment used in the draft determination.
- 7.7 In our engagement with the Reporter, we queried whether the scope risk applied to the wastewater and sewerage programmes was reflective of the level of detail included in the costing system. We still have some concerns in this regard and will explore this further when we are determining the costs for any schemes being submitted in the company's scope/uncertainty submissions in the first half of PC21.
- 7.8 Prior to publishing our draft determination, we engaged with the company on our sub-programme assessments to explain the rationale that had been applied and the outcome of the process. We adopted the same approach in the period between the draft and final determination as we considered NI Water's draft determination responses and reviewed our sub-programme assessments for the final determination. The outcome of this process is detailed below.

Sub-programme 00 – Capitalised salaries and on-costs

Background

- 7.9 NI Water incurs internal costs to manage the delivery of its capital programme which include costs of staff and internal support facilities. These salaries and on-costs are capitalised in the company's accounts and form a necessary part of the overall capital investment.
- 7.10 In Table 3.3 of its business plan, NI Water identified capitalised salaries and on-costs separately from the individual projects and programmes of work in its capital investment plan. We have followed this approach in our assessment of the capital investment submission.
- 7.11 NI Water has identified the need to increase the number of staff and costs to manage an expanded capital programme. The company's proposals show costs increasing from an average of £14.2m per annum in the last three



years of PC15 to an average of 20.7m in PC21 (an increase of 45% compared to an increase in the overall capital programme of 96% compared to the average over the last three years of PC15).

Utility Regulator

Assessment of NI Water's proposed investment

- 7.12 NI Water expects capitalised staff to increase from 277 in PC15 to 376 in PC21, an increase of 99
- 7.13 The unit rates for capitalised staff in PC15 and PC21 are calculated below.

	Nr	Cost £m	Unit rate £k/a	Change
PC15	277	14.22	51.34	
PC21	376	20.31	53.99	5.2%

Table 7.1: Unit rates for capitalised salaries and on-costs

- 7.14 We have used average rates for capitalised staff in PC15 to determine costs for additional staff in PC21.
- 7.15 The company provided a submission identifying the additional staff required for delivery of PC21 by various categories. We have reviewed this.



Category	Additional staff		Commentary	
category	BPS	DD		
ADD - Integrated Capital Delivery	32	25	Much of the additional work takes the form of major projects. Noting the allowance for consultancy design and project management we have allowed a reasonable level of additional resource to manage the project.	
ADD - Integrated Environmental Modelling	3	3	Integrated Environmental Management provides the opportunity to investigate integrated catchment solutions which could provide better solutions at a lower cost. We support the addition of a central catchment team responsible for maintaining integrated catchment information and acting centre of expertise for integrated catchment management.	
ADD - Living with Water Programme	7	7	The additional resource necessary to develop and deliver LWWP as a core management team with external liaison and stakeholder management.	
ADD - CPMO	16	4	We expect NI Water to already have a strong commercial approach to managing its existing programme and the works and have in place the necessary processes to deliver its programme of work efficiently. This should already include risk and value management, cost management and the management of contractors and consultants. While the company may wish to amend its management processes, these are not necessarily additional. We have included additional project management staff necessary to deliver the project work above and expect these staff to undertake risk management and contract management supported by the external project managers priced into the project costs. The company may wish to centralise some of these staff to improve efficiency in delivery.	

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Category	Additional staff		Commentary
	BPS	DD	
ADD - Strategic Client	11	8	The maintenance of asset information and costing systems is undertaken by the water and sewerage companies we use to benchmark NI Water's base maintenance. We have not allowed further resource to maintain these systems. The additional costs of modelling works have been identified as separate investment lines. We have allowed 3 additional staff to manage the increased level of activity in conjunction with the expended project management team included above. The company has asked for a core team of 5 to manage the ORA process and drive efficiency. We expect the ORA process to be undertaken by the project management team included above with a core team responsible for developing and maintaining the process. We have allowed for a core team of 2. We have allowed for 3 additional staff working on asset management data and development of asset management techniques.
ADD - Asset Lifecycle Planning	10	3	The capital maintenance element of the programme has not increased materially. The increase in capital maintenance is driven by consequential base maintenance on identified projects on the wastewater programme and should not require additional resource other than that identified above for project management. The maintenance of capacity and demand planning is part of the normal functions of a wastewater company and is inherent in the operational and base maintenance benchmarking we undertake to set and other base maintenance activities are inherent in the benchmarking we undertake to establish base maintenance costs.
ADD - Drinking Water Regulation, Analytic Services and SCAMP	10	2	The company has identified a range of risk and activities relating to water quality and water abstraction which it expects to increase in PC21. These are general activities which have been undertaken in PC15 and there is no expectation of an increase in PC21. Business as usual activities are included in the benchmark costs for operations and base maintenance. The cost of resources to manage the transitional works on the Analytical Services laboratories are included in the relevant project. Mature compliance costs have been included in opex. An additional 2 FTE have been included to support SCAMP and sampling activities.

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Category	Additio	nal staff	Commentary
	BPS	BPS DD	
ADD - Finance & Regulation Directorate	4	3	We accept that the increased capital programme will increase the demand on financial resources to address the increased capital programme. We have allowed three additional staff.
ADD - Customer Services Directorate	6	5	We recognise the need for CSDD staff to be involved in the development and implementation of projects and that this need will increase as the number and scale of projects increase. Increased investment can be explained by circa 150 major projects concentrated in the water and wastewater sectors. We have allowed 5 additional staff.
Total	99	60	

Table 7.2: Draft determination assessment of capitalised salaries and on-costs

Final determination assessment for capitalised Salaries and on-costs

- 7.16 In response to the draft determination, the company provided and updated assessment of the additional staff necessary it considered necessary to deliver the capital programme. This assessment accepted some of the adjustments made in the draft determination and, highlighting an omission in the business plan submission, asked for further staff to deliver the Living with Water programme. Taking account of these changes, the revised request was for 99 additional staff, the same as the request in the business plan submission.
- 7.17 In our assessment for the final determination, we have:
 - a) corrected an error in our calculation of average staff costs to ensure a consistent comparison on a pre-efficiency basis;
 - reviewed the additional information provided by the company and increased the number of additional staff allowed in the assessment of costs for the final determination to 81.



	Nr	Cost £m	Unit rate £k/a	Change
PC15	277	14.22	51.34	
PC21 – pre efficiency	376	20.94	55.70	8.5%
PC21 – post efficiency	376	20.66	54.95	7.0%

Table 7.3: Updated unit rates for capitalised salaries and on-costs

7.18 We expect the company to base the pre-efficiency estimates in its business plan on current costs. In the final determination, we have amended the average pre-efficiency cost of staff to PC15 average levels. This reduces the pre-efficiency costs of capitalise salaries and on-costs in PC21 by £9.8m (7.8%).



	Addition	nal staff	
Category	NIW update	FD	Commentary
ADD - Integrated Capital Delivery	25	25	We recognised the need for additional capital delivery staff in the draft determination and the company accepted our assessment.
ADD - Integrated Environmental Modelling	3	2	The company has identified additional IEM modelling staff for LWWP in its response to the draft determination. As a result, we have reduced the allowance in this category and expect the company to achieve synergies across the programme.
ADD - Living with Water Programme	24	21	In its response to the draft determination, the company identified an error in its business plan submission and ask for additional staff to support the delivery of the LWWP. This includes 6 additional CPMO staff transferred from the line below. We have allowed additional staff and expect the company to seek synergies across its programme including in its project management teams.
ADD - CPMO	10	6	The company reduced the number of staff requested in this category, transferring the requested staff to the LWWP. We have allowed 2 additional staff to provide a core team for this work but note that both internal and external project managers will also contribute to this work.
ADD - Strategic Client	10	8	In response to the draft determination, the company asked for two additional staff to enhance the unit costing system and integrated appraisals process. We expect all companies to have staff to undertake these activities and support efficiency delivery and that these costs are covered in the econometric assessment of base maintenance.
ADD - Asset Lifecycle Planning	10	6	The company has highlighted the need to undertake analytical work to support effective risk based asset maintenance. We agree with this, but note that it is an activity that all companies undertake as part of their asset management process and are therefore reflected in the econometric assessment of base maintenance.

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	Additional staf		
Category	NIW update	FD	Commentary
ADD - Drinking Water Regulation, Analytic Services and SCAMP	7	4	The company reduces its request for additional staff in response to the draft determination in recognition of a duplication of costs in its business plan. It added a further 4 wastewater analysts to support the capital programme. Other activities included in the request, such as the preparation of DWSPs are common to all companies and reflected in the econometric assessment of base maintenance. We have included two additional staff to reflect the increased wastewater activity on the capital programme.
ADD - Finance & Regulation Directorate	3	3	We recognised the need for additional finance staff to support capital delivery in the draft determination and the company accepted our assessment.
ADD - Customer Services Directorate	5	5	We recognised the need for additional operations staff to support capital delivery in the draft determination and the company accepted our assessment.
Reservoir safety team	2	1	We note the additional work on reservoir safety. We also note that a significant additional has been made to operational costs to address reservoir safety and expect the company to seek synergies in this area.
Total	99	81	

Table 7.4: Final determination assessment of capitalised salaries and on-costs

- 7.19 Our assessment include more than 80% of the additional staff identified by the company. While we have commented on individual areas above, the key themes in our assessment are the opportunities for synergies across different elements of the programme and the cross over of specific task identified in this assessment and the general activities undertaken by similar companies and included in the econometric assessment base maintenance. While we recognise the LWWP as a new development, the work remains similar in nature and scope to the type of work undertake across NI Water's capital investment programme. A close integration of delivery structures will continue to drive efficiencies.
- 7.20 We estimate that the reduction of 18 staff will reduce pre-efficiency costs by £5.5m over PC21, just less than £1m/a.



Sub-programme 01 – Base maintenance (water)

Background

- 7.21 This sub-programme identifies funding for general capital maintenance expenditure required for water non-infrastructure assets that is not covered in other programmes of work. This expenditure is intended to secure the operation of these assets and the service that they provide.
- 7.22 The investment proposals submitted by the company's for this subprogramme was broken down into fourteen different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Base maintenance (water)

Base maintenance at WTWs, RWPS and WPS

- 7.23 The company assessed its base maintenance requirements at water supply non-infra structure sites (water treatment works, raw water pumping stations and water pumping stations) using a Deterioration Risk and Reliability model. This was developed recently and has been used for investment planning for the first time in PC21.
- 7.24 This type of model uses an understanding of past failures, and the attributes of those assets that have failed, to build statistical relationships which are then used to predict when asset failures are expected to occur in the future. This forms the basis for assessing the level of repair and replacement activity required throughout the planning period and beyond.
- 7.25 The introduction of this type of assessment is a positive development. However, it is noted that it is in the early stages of implementation and that confidence in the outputs will need to develop over time through utilisation and validation. These issues were highlighted by the Reporter in his review of the submission, including the need for the company to maintain a greater focus on data quality and output validation moving forward.
- 7.26 The base maintenance funding for water treatment works, raw water pumping stations and water pumping stations was largely allowed in the draft determination. We deducted around £1.2m from the water treatment works budget to account for duplication of expenditure with the chemical and sludge tank programme (as identified through the Reporter's audit) and with base maintenance expenditure work included in sub-programme 04 (as




identified through our query process). We then applied the generic Reporter adjustment to establish our pre-efficiency allowance.

PSCEMD expenditure

- 7.27 The Preservation of Services and Civil Emergency Measures Direction requires NI Water to secure water supply assets to preserve services and mitigate the effects of a Civil Emergency. Dfl is the competent authority in respect of PSCEMD. It directs NI Water in relation to requirements and annual audits to assess compliance are undertaken by an approved external Certifier.
- 7.28 The company submitted two 'water' PSCEMD business cases for PC21:
 - 'PSCEMD Audit Outputs' covering the work required to address issues identified through the external certifier's annual audit. It included for upgrades to security measures at chlorine gas storage facilities at service reservoir as well as the replacement of static tanks which have reached the end of their useful life.
 - 'PSCEMD Base Maintenance' covering work identified by a consultant who was commissioned to carry out a review of the electronic and physical security measures, and communication links across NI Water's clean water asset base. This was undertaken on a sample basis and the findings extrapolated to other sites. NI Water categorised 59% of this work as enhancement
- 7.29 To establish the extent of work required in PC21, we engaged with Dfl, as the competent authority.
- 7.30 Dfl confirmed that the work identified by the external certifier is necessary. The costs in the 'PSCEMD Audit Outputs' business case were therefore allowed subject to the generic Reporter adjustment. We also checked and confirmed that the base/enhancement split reflected the breakdown of the investment proposed.
- 7.31 It is DfI's opinion however that once the issues raised by the external certifier have been addressed, NI Water will have upgraded all sites in line with the requisite security guidance and advice notes. It is therefore reasonable to assume that the majority of any further work identified in the 'PSCEMD Base Maintenance' business case would be maintenance work required to ensure that the security provisions already installed are maintained and continue to operate effectively. For the purposes of the draft determination we therefore changed the base maintenance allocation from 41% to 90%. This aligned with the allocations submitted by the company for the WTW, raw water pumping station and water pumping stations elements within the sub-



programme.

- 7.32 We had asked NI Water to review the purpose allocation for this expenditure based on our concerns and received a response at the time of writing the draft determination. The company's response indicated that it believed the base maintenance allocation should be 64%. We were not able to consider the supporting evidence provided by the company in the time available but advised that we would do so for the final determination.
- 7.33 We also noted concerns about the scale of the expenditure identified, particularly when many sites have recently been upgraded and are subject to annual audits by the external certifier. The consultant's findings are potentially sensitive to the particular sites chosen for the sample audit and so we noted that we planned to review the detailed cost estimates and their extrapolation further for the final determination.

Service Reservoir control panel rehabilitation

7.34 NI Water included a project for the replacement or refurbishment of 52 control panels at service reservoirs which are beyond their useful life. This work is necessary to maintain security of operation and supply. When we queried this expenditure, NI Water advised that the scope of work included in the original business case was incorrect. In its response, the company resubmitted a lower cost estimate that was allowed subject to the generic Reporter adjustment. This resulted in a 30% reduction in costs from those submitted in the business plan.

WTW treatability studies

- 7.35 NI Water plans to carry out treatability studies at 12 sites to inform investment requirements for PC27 at estimated a cost of £40k per site. This was found to be largely reflective of expenditure in PC15. NI Water had advised that this is the start of a cycle of undertaking treatability studies at 50% of WTWs in each regulatory price control period.
- 7.36 We recognise the need to review the effectiveness of treatment at water treatment works to ensure that the assets are maintained and emerging risks are identified and addressed. Therefore we included the investment proposed by the company in the draft determination subject to the generic Reporter adjustment.
- 7.37 We expect the company to agree the prioritisation, timing and scope of the proposed studies with the Drinking Water Inspectorate (DWI). The company should plan this work to ensure that DWI has adequate information and sufficient time to assess the proposals in advance of it submitting its business plan for PC27. This did not occur for PC21 despite us including



similar requirements in our PC15 final determination and this had a direct impact on our ability to conclude on water treatment works investment in our draft determination.

Utility Regulator

Instrumentation, Control, Automation and Telemetry (ICAT)

- 7.38 NI Water included 3 projects covering the investment required to upgrade instrumentation, control automation and telemetry at water distribution sites. This work standardises designs and facilitates automated remote control by using the telemetry system to interface between the corporate sections of the business and operational sites.
- 7.39 During PC21 the company plans to complete work at gravity service reservoirs sites which commenced in PC15 and extend the programme to 57 water pumping stations.
- 7.40 We recognise the benefits that ICAT functionality can deliver in terms balancing storage, improving resilience, 'calming' the network and improving efficiency of operation. We therefore allowed the budget subject to the generic Reporter adjustment.

Chlorine station base maintenance

- 7.41 The company inspected 83 chlorine dosing and/or chlorine analysis assets at service reservoir sites to establish condition assessments and the investment interventions required. The integrity of these assets is important due to the potential health and safety implications of failure.
- 7.42 Our assessment identified a potential overlap between the planned remedial work in this programme and that identified in the PSCEMD projects. The company confirmed that this was the case and reduced the submission accordingly. We applied the generic Reporter adjustment to this lower estimate resulting in a draft determination pre-efficiency allowance which was around 50% lower than the submission.

Chemical and Sludge Tanks – Water

- 7.43 This project covers the proactive replacement or refurbishment of chemical and sludge tanks at 18 water treatment works based on condition assessments. It includes for the supply and installation of bunded bulk chemical storage tanks (including PVC fill pipework, valves, fittings and support brackets where necessary). For the purposes of the draft determination, we allowed this budget subject to the generic Reporter adjustment.
- 7.44 We advised that for the final determination we would seek further evidence





that there is no overlap of expenditure between this and other investment areas, such as water treatment works base maintenance and investment at water treatment works included under sub-programme 04.

Other asset replacement projects

7.45 The company included 2 further projects covering work required at the Dorisland Aqueduct and Faughan Weir gates. These are key operational assets in need of replacement and the pre-efficiency budget was therefore allowed subject to the generic Reporter adjustment.

Draft determination summary

7.46 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
PSCEMD Audit Outputs	1.538	1.435	-0.103	-6.7%	57%
SR Rehab Programme of Works - Control Panel Replacement	2.413	1.682	-0.730	-30.3%	100%
WTW Treatability Studies to inform PC27	0.480	0.448	-0.032	-6.7%	100%
Dorisland Aqueduct replacement	1.401	1.308	-0.094	-6.7%	100%
WTW Base Maintenance	35.000	31.513	-3.488	-10.0%	90%
Raw Water PS Base Maintenance	1.221	1.139	-0.082	-6.7%	90%
WPS and WBS Base Maintenance	7.099	6.624	-0.476	-6.7%	90%
Chlorine Station Base Maintenance	2.193	1.134	-1.059	-48.3%	100%
Chemical and Sludge Tanks - Water	6.556	6.116	-0.439	-6.7%	100%
Faughan Weir Gates	1.000	0.933	-0.067	-6.7%	100%
PSCEMD Base Maintenance	7.720	7.203	-0.517	-6.7%	90%
iCAT for IOC - iSR Completion of PC15 Scope	0.969	0.904	-0.065	-6.7%	80%
iCAT for IOC - Completion of Gravity iSR's (mostly North Antrim) excluded from PC15 programme	0.485	0.452	-0.032	-6.7%	80%
iCAT for IOC - Installation of iWPS (Intelligent Water Pumping Stations)	5.123	4.780	-0.343	-6.7%	80%
Total	73.198	65.670	-7.528	-10.3%	90%

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Table 7.5: Investment in base maintenance (water)



Final determination assessment for Base maintenance (water)

- 7.47 In its response to the draft determination the company indicated that it did not consider the application of the generic Reporter adjustment to be appropriate and following the consideration of the outcome of further work undertaken by the Reporter it has been removed. Further information on the reason for this change can be found in Section 5.
- 7.48 The removal of the generic Reporter adjustment represents the only material change to our assessment since the draft determination. The rationale for the other challenges applied to the business plan submission in the draft determination continue to apply.
- 7.49 We considered the company's request to change the base maintenance allocation for the 'PSCEMD Base Maintenance' project line from 90% to 64%. However, on balance we have decided to retain the allocation of 90% applied in our draft determination. This is because:
 - It is reflective of NI Water's allocation for the WTW, raw water pumping station and water pumping stations elements of the sub-programme.
 - It is reflective of the overall allocation for the other investment within the sub-programme, inclusive of investment associated with PSCEMD Audit Outputs which would be expected to have a more significant enhancement bias.
 - It better aligns with Dfl's opinion that once the issues raised by the external certifier have been addressed, NI Water will have upgraded all sites in line with the requisite security guidance and advice notes. We would therefore expect that the majority of any further work required would be for maintaining the security provisions already installed to ensure they continue to operate effectively.
- 7.50 In the draft determination we also noted that we would seek further evidence that there was no overlap of expenditure between the 'Chemical and Sludge Tanks Water' programme line and other investment areas, such as water treatment works base maintenance and investment at water treatment works included under sub-programme 04.
- 7.51 In its response to the draft determination, the company identified around £129k of potential duplication with the investment for water treatment works submitted in sub-programme 04. This duplication has been accounted for in the final determination by adjusting the relevant project allocations within the water treatment sub-programme.



7.52 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
PSCEMD Audit Outputs	1.538	1.538	0.000	0.0%	57%
SR Rehab Programme of Works - Control Panel Replacement	2.413	1.803	-0.610	-25.3%	100%
WTW Treatability Studies to inform PC27	0.480	0.480	0.000	0.0%	100%
Dorisland Aqueduct replacement	1.401	1.401	0.000	0.0%	100%
WTW Base Maintenance	35.000	33.776	-1.225	-3.5%	90%
Raw Water PS Base Maintenance	1.221	1.221	0.000	0.0%	90%
WPS and WBS Base Maintenance	7.099	7.099	0.000	0.0%	90%
Chlorine Station Base Maintenance	2.193	1.215	-0.978	-44.6%	100%
Chemical and Sludge Tanks - Water	6.556	6.556	0.000	0.0%	100%
Faughan Weir Gates	1.000	1.000	0.000	0.0%	100%
PSCEMD Base Maintenance	7.720	7.720	0.000	0.0%	90%
iCAT for IOC - iSR Completion of PC15 Scope	0.969	0.969	0.000	0.0%	80%
iCAT for IOC - Completion of Gravity iSR's (mostly North Antrim) excluded from PC15 programme	0.485	0.485	0.000	0.0%	80%
iCAT for IOC - Installation of iWPS (Intelligent Water Pumping Stations)	5.123	5.123	0.000	0.0%	80%
Total	73.198	70.386	-2.812	-3.8%	90%

Table 7.6: Investment in base maintenance (water)



Sub-programme 02 – Base maintenance (sewerage)

Background

- 7.53 This sub-programme identifies funding for general capital maintenance expenditure required at wastewater non-infrastructure assets that is not covered in other programmes of work. This expenditure is intended to secure the operation of these assets and the service that they provide.
- 7.54 The investment proposals submitted by the company's for this subprogramme was broken down into five different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Base maintenance (sewerage)

WwTW and WWPs Base maintenance

- 7.55 NI Water initially assessed its base maintenance requirements for wastewater treatment works and wastewater pumping using its new Deterioration Risk and Reliability model. This was similar to the approach adopted for the clean water base maintenance sub-programme 01. The company however reverted to alternative approaches in its submission due to concerns over the level of expenditure being predicted by the model.
- 7.56 NI Water based its WwTW base maintenance requirements on PC15 runrate expenditure and then uplifted this figure by £33m for investment to address risks associated with the implementation of a 'mature' compliance model in the future by NIEA (i.e. unannounced final effluent regulatory sampling). We removed the £33m related to mature compliance based on the Reporter's recommendation. The Reporter's recommendation was based on the fact that the estimate was high-level and lacking in clear rationale to explain and justify the cost, risk and base maintenance allocation assumptions.
- 7.57 The generic Reporter adjustment was applied to the remaining budget to determine the pre-efficiency PC21 allowance. This resulted in a figure which was just under 30% lower than the company submission. Whilst we removed the mature compliance element for the draft determination, we noted that we were prepared to consider this further if the company could provide a well-founded plan which clearly demonstrated that the investment would secure compliance in the longer term.



7.58 The company's wastewater pumping station asset submission was based on the output from DRRM modelling. NI Water indicated that this could potentially equate to an average spend of £23k per site, based on the overall number of pumping stations. We accepted the investment proposals on this basis and applied the generic Reporter adjustment to determine the preefficiency allowance for PC21.

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Chemical and Sludge Tanks – Wastewater

- 7.59 This project covers the proactive replacement, or refurbishment, of chemical and sludge tanks at 27 wastewater treatment works >10,000PE and 141 wastewater treatment works <10,000PE. The requirements for sites >10,000PE were determined through individual site surveys to assess the condition of the assets. The requirements for sites <10,000PE were determined through the extrapolation of the findings from assessments undertaken at a sample of 12 sites.</p>
- 7.60 For the purposes of the draft determination, we allowed the pre-efficiency budget subject to the generic Reporter adjustment. However, we noted that for the final determination we would seek further evidence that there was no overlap of expenditure between this and other investment areas, such as wastewater treatment works base maintenance and specific investment at wastewater treatment works included under sub-programme 16.

Lisburn WWTW - Control Panels and Primary Tank Scrappers

7.61 This project is for the replacement of end of life assets which have associated health and safety and reliability issues. The company indicated that this project was extracted from the general wastewater treatment works allocation due to the bespoke nature of the work. The Reporter reviewed the company's approach and indicated that it was sensible considering the specific nature of the work involved. The submitted costs were therefore included subject to the generic Reporter adjustment.

Health & Safety - Assessment of GRP Flooring

7.62 This project is for the phased replacement of Fibre-Reinforced Polymer (FRP) walkways on a priority basis. These are no longer deemed suitable following the receipt of a number of health and safety alerts. Requirements have been identified through visual condition assessments at 126 sites carried out by a consultant on behalf of NI Water. The visual inspections have been supplemented by some limited sample tests. Due to the potential H&S implications, costs were allowed subject to the generic Reporter adjustment.

Draft determination summary

7.63 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
WWTW Base Maintenance	140.000	99.831	-40.169	-28.7%	90%
WWPS Base Maintenance	30.000	27.990	-2.010	-6.7%	90%
Chemical and Sludge Tanks - Wastewater	13.549	12.642	-0.908	-6.7%	100%
Lisburn WWTW - Control Panels and Primary Tank Scrappers	1.998	1.864	-0.134	-6.7%	90%
Health & Safety - Assessment of GRP Flooring	0.999	0.932	-0.067	-6.7%	100%
Total	186.547	143.259	-43.288	-23.2%	91%

Table 7.7: Investment in base maintenance (sewerage).

Final determination assessment for Base maintenance (sewerage)

- 7.64 In our draft determination, we indicated that we were prepared to consider the deduction of the £33m for 'mature' compliance further if the company could provide a well-founded plan which clearly demonstrated that the investment would secure compliance in the longer term.
- 7.65 In response, the company submitted a paper providing additional detail on why this money was required and what it would be used for. NIEA has also advised that it supports the need for this investment and sees it as being critical to the company and NIEA being able to prepare effectively for the implementation of the new compliance model in PC27. We have therefore reinstated the funding for mature compliance based on the additional information submitted by the company and because of NIEA's support. This work was allocated to base maintenance in the business plan submission. In its response to the draft determination, the company allocated part of the expenditure to enhancement. In the final determination, we have allocated 40% of the 'mature compliance' investment to base and included this allocation as consequential capital maintenance.
- 7.66 In our draft determination we also noted that we would seek further evidence that there was no overlap of expenditure between the 'Chemical and Sludge Tanks – Wastewater' programme and other investment areas, such as such



as wastewater treatment works base maintenance and specific investment at wastewater treatment works included under sub-programme 16.

7.67 In its response, the company identified around £1.7m of potential duplication between this project and the wastewater treatment work projects in sub-programmes 16 and 17. In addition, the company identified a further £0.48m of potential duplication with the WwTW Base Maintenance project. As a result we have deducted £2.2m from the 'Chemical and Sludge Tanks – Wastewater' programme line in the final determination.

Final determination summary

- 7.68 In line with the revised approach explained in Section 5, we have also removed the generic Reporter adjustment from all programme lines.
- 7.69 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
WWTW Base Maintenance	140.000	140.000	0.000	0.0%	90%
WWPS Base Maintenance	30.000	30.000	0.000	0.0%	90%
Chemical and Sludge Tanks - Wastewater	13.549	11.349	-2.200	-16.2%	100%
Lisburn WWTW - Control Panels and Primary Tank Scrappers	1.998	1.998	0.000	0.0%	90%
Health & Safety - Assessment of GRP Flooring	0.999	0.999	0.000	0.0%	100%
Total	186.547	184.347	-2.200	-1.2%	91%

 Table 7.8: Investment in base maintenance (sewerage).

Sub-programme 03 – Water resources and Supply Resilience

Background

- 7.70 This sub-programme covers how NI Water manages its responsibilities upstream of its water treatment works and assesses how best to maintain the balance between the supply and demand for water over the long term.
- 7.71 The investment proposals submitted by the company's for this subprogramme was broken down into five different project lines. The outcome of our draft and final determination assessments for each element is set out



below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Water resources and Supply Resilience

Water Resources and Supply Resilience Plan

- 7.72 NI Water has a statutory requirement to produce a water resources and supply resilience plan. The plan sets out how the company will maintain the balance between supply and demand for water over the long-term. The plan takes into account changes in population, housing, water usage and incorporates any predicted changes to our climate. It considers how water supplies would be maintained during an average dry year as well as during critical periods such as severe winters, drought and includes a drought plan.
- 7.73 Historically, NI Water revised its plan on a 5 year cycle but has moved to a 6 year cycle to align with regulatory price controls following legislative changes. This allows NI Water to incorporate the investment interventions identified in the water resources and supply resilience plan into its price control business plan submission.
- 7.74 As NI Water has a duty to produce the WR & SR plan, we allowed the requested amount less the generic reporter adjustment in the draft determination.

Reservoir inspections

- 7.75 The GB Reservoirs Act 1975 includes an inspection regime for "large raised reservoirs". The Reservoirs (Northern Ireland) Act is likely to be brought into effect during PC21 and will mirror the requirements of the GB legislation. This will make the inspection and maintenance of controlled reservoirs mandatory.
- 7.76 Despite the lack of local legislation NI Water has been acting in the spirit of the GB legislation for some time and has been carrying out "All Reservoir Panel Inspections" at its impounding reservoirs. All 45 impounding reservoirs were inspected during PC15 and these inspections have generated a list of work to be executed during PC21. Due to changes in legislation, 41 large service reservoirs capable of holding in excess of 10,000m³ will also have to be inspected moving forward. The frequency of inspection is 10 years.
- 7.77 NI Water requested funding to cover:
 - a) Work generated from PC15 inspections (£6.525m).





- b) Anticipated cost of works generated from inspections of 41 service reservoirs (£1.077m).
- c) Inspection of 45 impounding reservoirs and 20 service reservoirs during PC21 (£0.511m).
- d) Retention of Supervising Engineer (£0.495m).
- 7.78 This work is driven by legislative requirements and is necessary to ensure the safety and integrity of these critical assets. In determining our draft determination pre-efficiency allowances we:
 - Allowed for the PC21 work generated by the PC15 inspections and the anticipated cost of works generated from inspections of 41 service reservoirs less the generic Reporter adjustment.
 - Allowed 50% of the funding for PC21 impounding reservoir inspections subject to the generic Reporter adjustment. We reduced this allowance as we concluded that only a limited number of impounding reservoirs would require inspection during PC21 period based on the 10 year inspection cycle. Our conclusion was that the provision of this level of funding would allow 50% of inspections to be undertaken and for the company to start to 'smooth' the profile of inspections over forthcoming price control periods.
 - Allowed all of the SR inspections less the generic Reporter adjustment as no inspections have been undertaken at these sites previously.
 - Allowed the funding for the retention of a Supervising Engineer less the generic Reporter adjustment.

SCAMP

- 7.79 Sustainable catchment management planning (SCAMP) covers a broad range of activities in upstream catchments which aim to redress degradation of the landscape which can accelerate run-off and reduce water quality. Typical examples of activities are: working with farmers to reduce pesticide run-off; slowing run-off from peat bogs; managing fire risk on heather and managing livestock to reduce contamination of watercourses. As a major owner of upland catchment, SCAMP provides NI Water with a framework for responsible and sustainable management of, landscape, biodiversity and heritage.
- 7.80 NI Water completed catchment management plans for all its 'live' catchments in PC15. At the start of PC21 there will be 23 active catchment management plans in place and the company plans to progress from





planning to implementation of solutions to contribute to achieving SCAMP objectives based on a detailed list of costed activities.

7.81 We consider this an important focus for the company, with the potential to deliver real benefits to consumers and we included the proposed investment subject to the generic reporter adjustment in the draft determination.

Abstraction Monitoring

- 7.82 NI Water abstraction licences will be reviewed by NIEA to ensure compliance with the Water Framework Directive. It is likely that new licences will require a greater level of monitoring (flow) within the catchment and will have greater need for environmental measures to be introduced.
- 7.83 During PC15 NI Water undertook surveys on all abstraction points to determine what additional monitoring arrangements would be needed to achieve NIEA's revised abstraction licence standards. A plan has been developed for implementation during PC21 in consultation with NIEA which involves installation of flow and quality monitoring equipment at a number of abstraction points and water treatment works on a priority basis.
- 7.84 NI Water needs to have a monitoring programme in place, as agreed with NIEA, to enable it to receive revised abstraction licences and meet the WFD requirements. We, therefore, allowed the requested amount in full less the generic reporter adjustment in the draft determination.

Mourne Wall Restoration

- 7.85 The Mourne Wall is a dry stone wall built around a section of the Mourne Mountains for the purposes of keeping livestock away from the impounding reservoirs in the area. The wall was constructed between 1904 and 1922 and is now a listed building, meaning it falls under the 'Protocol for the Care of the Government Historic Estate'. Over time, and due to human interference, there are numerous sections of the wall which have collapsed or are on the verge of collapse.
- 7.86 NI Water has undertaken a detailed inspection of the wall and has identified a budget of (£2.518m) required to effect repairs. The cost estimate is based on unit costs from PC15 and so we allowed the funding in full.

Draft determination summary

7.87 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
WR & SR Plan Review	0.680	0.634	-0.046	-6.7%	0%
Inspections	8.653	7.895	-0.758	-8.8%	60%
SCAMP	5.678	5.297	-0.380	-6.7%	100%
Abstraction Monitoring	3.731	3.481	-0.250	-6.7%	96%
Mourne Wall Restoration	2.518	2.518	0.000	0%	100%
Totals	21.259	19.826	-1.433	-6.7%	85%

Table 7.9: Investment in Water resources and Supply Resilience

Final determination assessment for Water resources and Supply Resilience

Reservoir inspections

- 7.88 In its response to the draft determination and through subsequent engagement, NI Water explained why it planned to undertake all reservoir inspections in PC21 despite some not being required based on the 10 year inspection cycle. This is to allow sufficient time for it to carry out all the remedial work identified by the panel engineer. Historically, NI Water has had trouble completing all of the remedial works within the timeframe allowed by the panel engineer, resulting in the need to re-inspect at additional cost.
- 7.89 NI Water advised that completing the impounding reservoir inspections to the timescale proposed in the business plan would allow it to programme and execute the works within allowed timeframes. This will help avoid the need for a further inspection work within the ten year period and smooth out the maintenance workflow in subsequent price controls. We have accepted NI Water's rationale and have reinstated the funding in the final determination on this basis.
- 7.90 NI Water also informed us that, due to COVID-19 restrictions, only five of the scheduled 20 service reservoirs inspections were undertaken in PC15. We have included an additional amount of £0.121m in the final determination to allow NI Water to carry out inspections at these sites bringing the total funding for reservoir inspections to £1.172m.

Other projects

7.91 NI Water accepted our draft determination for all remaining projects in this sub-programme and so no further adjustments to baseline costs were made for the final determination.



Final determination summary

- 7.92 In line with the revised approach explained in Section 5, we have also removed the generic Reporter adjustment from all programme lines.
- 7.93 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
WR & SR Plan Review	0.680	0.680	0.000	0%	0%
Controlled reservoir maintenance	7.602	7.602	0.000	0%	60%
All reservoir panel inspections	1.051	1.172	0.121	11.5%	60%
SCAMP	5.678	5.678	0.000	0%	100%
Abstraction Monitoring	3.731	3.731	0.000	0%	96%
Mourne Wall Restoration	2.518	2.518	0.000	0%	100%
Totals	21.259	21.380	0.121	0.6%	85%

Table 7.10: Investment in Water resources and Supply Resilience

Sub-programme 04 – Water treatment works

Background

- 7.94 NI Water operates 23 water treatment works which deliver approximately 590Mld into supply. This includes around 260Mld produced by the four Public Private Partnership (PPP) water treatment works operated by NI Water Alpha which NI Water recently purchased from the previous concessionaire.
- 7.95 NI Water must maintain its water treatment works to secure their performance in relation to both the high quality and volume of water supplied to customers. NI Water's investment in PC15 was focused on major upgrades at individual treatment works to maintain compliance, either on the basis of assessed risk or enforcement by DWI. The investment submission for PC21 was much broader with some level of enhancement investment proposed at 20 of the water treatment work sites.
- 7.96 The PC21 investment proposals broadly fall into 3 categories.
 - a) Investment at water treatment works where persistent failures against regulatory standards have occurred and enforcement is in place, or



where assessed performance indicates that there is a high risk of persistent failures moving forward. NI Water seeks support directly from DWI for this type of investment through an 'Annex A' process and we take DWI's agreement as validation of the investment need.

- b) 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 treatment processes more robust. In this case, NI Water does not seek support from DWI and we conclude on the need based on the evidence submitted by the company.
- c) Investment to meet other drivers not directly related to the compliance of drinking water with the current water quality standards. This category includes investment to comply with internal Environmental Management System standards to help mitigate against pollution, to assess and prepare for proposed EU amendments to the Drinking Water Directive and to ensure that all water fittings comply with Water Fitting Regulations to help mitigate against contamination and risk to public health.
- 7.97 For the draft determination, we dealt with each of these areas of investment separately and we have adopted the same approach for the final determination. The investment proposals submitted by the company under each area and the outcome of our draft and final determination assessments for each element of investment is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Investment in Annex A water treatment works

Draft Determination Assessment for Annex A works

- 7.98 NI Water proposed investment at 13 sites. This included the 4 PPP treatment works operated by NI Water Alpha.
- 7.99 NI Water had issued nine water treatment works Annex A submissions to DWI. The NI Water Alpha sites were not included, but we understood that the company planned to make a further submission to DWI in relation to these sites in advance of the final determination.
- 7.100 DWI formally responded to NI Water's Annex A submissions at the start of September 2020. In its response it expressed a number of concerns which we endorsed in the draft determination, namely:
 - That the proposed WTWs programme was 'back end' loaded. This was of particular concern for Annex A works which would be expected



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- That Bouchier and Badenoch recommendations in relation to cryptosporidium had been identified at a number of sites. These requirements were identified in the 1990s and we were unclear why investment to address any shortcomings had not been prioritised in the interim.
- That the justification for the internal targets chosen by NI Water to assess risk and justify investment was not clear. For example, the reduction of the company's internal target for THMs from 75µg/l to 50µg/l in 2018, which was identified as a parameter of concern at seven of the nine 'Annex A' works. We noted that using this lower threshold to justify investment had the potential to drive inappropriate decisions and result in unnecessary investment if it was not clearly linked to the risk of non-compliance with regulatory standards. We advised that the justification for the change in internal standards would need to be clarified prior to the final determination to demonstrate that any associated investment was necessary.
- 7.101 DWI's conclusions in relation to each of the Annex A submissions at the time of the draft determination can be seen in the table below.

	Parameters	DWI Decision Assessment	Further Information Requested
Altnahinch WTW	THMs, Aluminium, Turbidity	YES - Further information requested	A copy of the treatability study to be provided to enable a more detailed assessment of treatment requirements to be made.
Caugh Hill WTW	THMs	YES - Further information requested	Clarification required on whether recommendations contained in the Arup report and in the DWSP Risk Assessment Action Plan with respect to Cryptosporidium control and THMs are to be completed as they are not referred to in the Annex A.
Clay Lake WTW	Turbidity, THMs, Disinfection, Cryptosporidium	YES - Further clarification and discussion in relation to the detail of the proposals.	N/A
Derg WTW	THMs	Further information requested to enable assessment to be made	Further information identifying a preferred option is required to enable DWI to support the application to ensure THMs compliance will improve. An updated Annex A should be submitted removing works that are planned for completion in 2020/21 as part of the enforcement Notice. There is limited evidence that THMs is an issue at the WTW but appears to be more of a risk in distribution due to the length of the network.
Drumaroad WTW	Aluminium, Cryptosporidium	YES – Further information requested	Clarification on the presence or not of automatic coagulation and assurance that the proposed works will improve the water treatment process for aluminium compliance. Final investigation report into the cause of the Cryptosporidium is also required.
Dungonnell WTW	THMs	Further information requested to enable assessment to be made	A copy of the treatability study to be provided to enable DWI to establish the justification for concluding that lon Exchange is the preferred option for the pilot study. Information to be provided on the interim measures to manage the risk until the pilot study is completed and the remedial works are complete.
Killyhevlin WTW	Cryptosporidium THMs	Further information requested to enable assessment to be made	A copy of the full treatability study to be provided, highlighting the areas o highest risk for Cryptosporidium and the specific recommendations referred to in Annex A.

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Lough Fea WTW	Cryptosporidium Disinfection, Treated water quality (turbidity, aluminium, iron)	YES	N/A
Seagahan WTW	THMs, Cryptosporidium Turbidity	YES	N/A

Table 7.11: Annex A submissions.

- 7.102 Two of the submissions received unqualified agreement, four received agreement pending the receipt of additional information on specific elements of the proposal and further information was required on three of the submissions to allow DWI to make an assessment.
- 7.103 We therefore advised that our final decision on whether to allow these schemes would need to wait until DWI had received the information requested and had come to its final conclusions on whether investment for water quality reasons was required.
- 7.104 For the purposes of the draft determination we included the investment for the nine Annex A works, subject to the application the generic Reporter adjustment. This allowance was made on a precautionary basis pending the outcome of DWI's considerations.
- 7.105 We excluded all of the investment proposed for the Alpha WTW sites in the draft determination. We noted that these sites had recently been purchased by NI Water from the previous concessionaire and that this process was subject to a cost benefit analysis and due diligence exercise. Our assumption was therefore that NI Water would have assured itself that it was purchasing fit for purpose assets which were operationally robust and capable of meeting regulatory standards. Linked to this was the expectation that any additional investment requirements would primarily be for maintenance purposes and that NI Water would be expected to address this through its allocation for 'WTW Base Maintenance' under sub-programme 01.

Draft determination summary for Annex A works

7.106 The outcome of our assessments for each element in this area resulted in the following pre-efficiency allowances in the draft determination.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Upgrade to Killyhevlin	0.422	0.393	-0.028	-6.7%	17%
Clay Lake Treatability Improvements	0.737	0.688	-0.049	-6.7%	9%
Lough Fea Treatability Improvements	0.673	0.628	-0.045	-6.7%	65%
Seagahan Treatability Improvements	0.947	0.883	-0.063	-6.7%	27%
Altnahinch Treatability Improvements	1.819	1.697	-0.122	-6.7%	32%
Dungonnell Treatability Improvements	0.390	0.364	-0.026	-6.7%	0%
Drumaroad Treatability Improvements	0.479	0.447	-0.032	-6.7%	0%
Derg Treatability Improvements	3.628	3.385	-0.243	-6.7%	13%
Caugh Hill Treatability Improvements	11.453	10.686	-0.767	-6.7%	5%
NIW Alpha WTWs Treatability Improvements	7.411	0.000	-7.411	-100%	6%
Total	27.959	19.172	-8.788	-31%	12%

Table 7.12: Investment in Annex A water treatment works.

Final determination assessment for Annex A works

- 7.107 In the period between the draft and final determination, DWI and NI Water engaged further on the nine Annex A works and the information requested by DWI was provided.
- 7.108 NI Water explained that it had changed its internal target for THMs from 75µg/l to 50µg/l to align with the approach adopted for other water quality parameters. DWI has accepted this explanation and associated investment needs have been agreed on that basis.
- 7.109 DWI has therefore now confirmed its support for water quality investment at all nine Annex A sites based on the information provided by NI Water and we have allowed the majority of the investment requested on that basis.
- 7.110 We have removed a small amount of expenditure from the Caugh Hill Treatability project as a consequence of the company identifying some duplication with investment for chemical tanks included in sub-programme 01.



7.111 We have also removed an element of investment associated with the introduction caustic soda dosing at Altnahinch WTWs following stakeholder discussions at a recent PC21 Drinking Water Quality working group. These discussions indicated that this investment was unlikely to be required if planned improvements to the lime dosing system proved successful.

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- 7.112 This may also be the case at Derg WTW. However, NI Water has advised that it is reviewing investment proposals entirely at this site following completion of a pilot study which suggests that the replacement of the existing Dissolved Air Flotation (DAF) plant with conventional clarifiers might produce better water quality results. NI Water was unable to provide revised proposals and costs for Derg WTW in time for the final determination, but has suggested that investment needs at the site are likely to increase as a result. We therefore decided not to remove the caustic dosing costs in advance of seeing the outcome of this work.
- 7.113 We expect NI Water to submit its final proposals and costs for Derg WTW to principal stakeholders for consideration through the formal Change Control mechanism. In doing so, we expect the company to consider and present a consolidated solution for the treatment works which covers both the proposed PC21 improvements and essential work required to address MCPA failures at the site. The latter was the subject of enforcement action by DWI and stakeholder budget approval during PC15 but was not completed by the company as planned. The development of a consolidated solution for addressing all issues at the site is identified. We have allowed carry over expenditure for the work required to address MCPA failures in the final determination to ensure that this can occur.
- 7.114 The company has also advised that there is a broader shift in the wider industry away from DAF plants back to conventional clarification. We are aware that it plans to undertake pilot studies, similar to the one that has resulted in a change to the proposed solution at Derg WTW, at other water treatment works in the near future.
- 7.115 In light of this proposal, we would expect the company to avoid committing to expenditure, particularly that associated with DAF refurbishment and any ancillary work, until the outcome of the pilot trials are known. If these studies demonstrate that there needs to be wholesale changes to its water treatment work investment proposals, we would expect NI Water to address this through the formal Change Control mechanism. In this circumstance, redetermination of costs alongside the planned wastewater and sewerage scope/uncertainty submissions could be considered.
- 7.116 For PC27 we would expect NI Water to complete similar trials in time to



confirm the optimum solutions and costs for its business plan submission. It is disappointing this did not occur for PC21.

- 7.117 NI Water did not submit Annex A proposals for the Alpha WTW sites to DWI in advance of the final determination as anticipated. In its draft determination response, the company indicated it would be early 2022 before it would be able to do so.
- 7.118 The provision of an allowance for quality improvements at these sites is dependent on DWI confirming their support through the established Annex A process. As this has not been secured, we have excluded the costs in the final determination. NI Water should seek approval for any additional enhancement investment required at these sites through the formal Change Control mechanism once treatability studies have been completed and the Annex A approval process has concluded.
- 7.119 We have however 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. The allowance of this budget will allow this work to progress in isolation or as part of a broader scheme if required.
- 7.120 The company has pulled forward the water treatment works delivery profile slightly in its draft determination response. This includes the delivery of Caugh Hill which was brought forward from 2026-27 to 2024-25. This goes some way to addressing stakeholder concerns over the 'back end' loading of the original programme and the revised profile has been accepted on this basis.

Final determination summary for Annex A works

- 7.121 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines.
- 7.122 The final determination pre-efficiency allowances resulting from all the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Upgrade to Killyhevlin	0.422	0.422	0.000	0.0%	17%
Clay Lake Treatability Improvements	0.737	0.737	0.000	0.0%	9%
Lough Fea Treatability Improvements	0.673	0.673	0.000	0.0%	65%
Seagahan Treatability Improvements	0.947	0.947	0.000	0.0%	27%
Altnahinch Treatability Improvements	1.819	0.885	-0.934	-51.4%	32%
Dungonnell Treatability Improvements	0.390	0.390	0.000	0.0%	0%
Drumaroad Treatability Improvements	0.479	0.479	0.000	0.0%	0%
Derg Treatability Improvements	3.628	3.628	0.000	0.0%	13%
Caugh Hill Treatability Improvements	11.453	11.434	-0.020	-0.2%	5%
NIW Alpha WTWs Treatability Improvements	7.411	0.000	-7.411	-100%	6%
Total	27.959	19.594	-8.365	-30%	11%

Table 7.13: Investment in Annex A water treatment works.

Investment in 'other' water treatment works

Draft determination assessment for 'other' water treatment works

- 7.123 NI Water proposed a range of investment at nine other water treatment works sites. This included the installation of auto-coagulation, filter upgrades, wash water upgrades and improvements to chemical dosing.
- 7.124 The proposed investment represented average expenditure of around £350k per site. In the draft determination we acknowledged that an element of ongoing investment to help secure general improvements in performance at these works in terms of water quality, reliability, resilience and efficiency was likely to be required.
- 7.125 We checked the base/enhancement split applied by the company for each scheme by reviewing the individual elements of investment included within the company's costing system. In general the split proposed did not appear unreasonable apart from Carmoney WTW which the company had submitted



as 99% Enhancement. Our assessment suggested this should be closer to 100% base maintenance as it primarily related to refurbishment of existing assets. This scheme was deferred from PC15 and we noted that in the PC15 submission NI Water had indicated it was 100% base maintenance. So we changed the base maintenance allocation from 1% to 96%, to reflect the outcome of our assessment.

- 7.126 We also made some cost adjustments in this investment area. We removed expenditure for a proposed treatability study at Carmoney which we believed should be covered by the 'WTW treatability Studies for PC27' project in sub-programme 01. We also removed 50% of the costs submitted for the Glenhordial sludge treatment project pending clarification on expenditure included for work required at the receiving WwTW site.
- 7.127 For the remainder of the sites we allowed the submitted costs, following the application of the generic Reporter adjustment to establish the pre-efficiency allowances for the draft determination. However, we advised that prior to the final determination we intended to reconsider:
 - Why so many of the business cases refer to water quality issues when the risk is not deemed sufficient to merit an 'Annex A' submission.
 - Why further treatability investment is required at Glenhordial WTW following completion of a treatability scheme in PC15 at a cost of around £0.6m.
 - Whether some expenditure could be deferred pending completion of other remedial work or the investigation of alternative processes, for example remedial work to the soda ash system at Lough Bradan where lime dosing is being considered as an alternative.
 - Whether work on containment of dosing lines is a duplication of work included in the EMS project.

Draft Determination summary for 'other' water treatment works

7.128 The outcome of our assessments for each element in this area resulted in the following pre-efficiency allowances in the draft determination.



	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Loughmacrory Treatability Improvements	0.488	0.455	-0.033	-6.7%	41%
Fofanny Treatability Improvements	0.176	0.164	-0.012	-6.7%	12%
Carran Hill Treatability Improvements	0.084	0.078	-0.006	-6.7%	22%
Belleek Treatability Improvements	0.149	0.139	-0.010	-6.7%	57%
Glenhordial Treatability Improvements	0.341	0.318	-0.023	-6.7%	60%
Lough Bradan Treatability Improvements	0.286	0.267	-0.019	-6.7%	19%
Killyhevlin DWW Tank	0.420	0.391	-0.028	-6.7%	0%
Carmoney Treatability Improvements	1.005	0.867	-0.137	-14%	96%
Glenhordial WTW Sludge Improvements	0.189	0.088	-0.101	-53%	2%
Total	3.136	2.768	-0.368	-12%	50%

Table 7.14: Investment in other treatment works.

Final determination assessment for 'other' water treatment works

- 7.129 In its response to the draft determination, the company confirmed that it accepted our adjustment to the purpose allocation for Carmoney WTW and the removal the treatability study costs from this scheme.
- 7.130 In addition, the company identified some duplication of expenditure between the Glenhordial Treatability Study project and the chemical tank investment proposals included in sub-programme 01. The allowance for Glenhordial has been adjusted accordingly in the final determination.
- 7.131 However, NI Water challenged our deduction of costs that had been included in the Glenhordial Sludge Treatment project for the provision of a sludge holding tank at the receiving WwTW site. We have reinstated these costs for the final determination based on the explanation provided by the company in its draft determination response.
- 7.132 The company addressed all the other concerns from the draft determination and so no further adjustments to baseline costs were made in the final determination.



Final determination summary for 'other' water treatment works

- 7.133 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines.
- 7.134 The final determination pre-efficiency allowances resulting from all the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Loughmacrory Treatability Improvements	0.488	0.488	0.000	0.0%	41%
Fofanny Treatability Improvements	0.176	0.176	0.000	0.0%	12%
Carran Hill Treatability Improvements	0.084	0.084	0.000	0.0%	22%
Belleek Treatability Improvements	0.149	0.149	0.000	0.0%	57%
Glenhordial Treatability Improvements	0.341	0.232	-0.109	-32.0%	60%
Lough Bradan Treatability Improvements	0.286	0.286	0.000	0.0%	19%
Killyhevlin DWW Tank	0.420	0.420	0.000	0.0%	0%
Carmoney Treatability Improvements	1.005	0.929	-0.075	-7%	96%
Glenhordial WTW Sludge Improvements	0.189	0.189	0.000	0%	2%
Total	3.136	2.952	-0.184	-6%	48%

Table 7.15: Investment in other treatment works.

Projects related to other drivers

Draft determination Assessment for Projects related to other drivers

- 7.135 NI Water included three further projects in this sub-programme related to investment for:
 - Pollution prevention activities at water treatment work sites. This is required to help ensure compliance with the company's internal Environmental Management System which has been updated to reflect NIEA's Pollution Prevention Guidelines. Example activities



include diversion or sealing of site drainage from high risk areas, provision of new and refurbished bunds for tanks, provision of spill detection equipment and fuel interceptors to help prevent pollutants entering site drainage.

Utility Regulator

- A review of the potential impact of the EU's recast of Directive 98/83/EC should this be adopted into UK law. This investment also covers a review of other emerging issues such as antimicrobial resistance and micro plastics.
- c) A programme of work to ensure that all operational WTW sites comply with The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009. This will help mitigate the risk of contamination of the public water supply through back-syphonage.
- 7.136 In the draft determination, we acknowledged the need for investment in these areas and allowed the expenditure subject to the generic Reporter adjustment.
- 7.137 We recognised that there was uncertainty with regard to the impact that the re-cast of the Drinking Water Directive might have and indicated that we would review the submitted costs for the final determination if greater clarity on the requirements and the plans for implementation became available.

Draft determination summary for 'other' water treatment works

7.138 The outcome of our assessments for each element in this area resulted in the following pre-efficiency allowances in the draft determination.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
WTW - EMS	1.341	1.251	-0.090	-6.7%	59%
DWD Recast & Emerging Issues Study	0.283	0.264	-0.019	-6.7%	0%
Back-syphonage WTW	1.091	1.018	-0.073	-6.7%	19%
Total	2.715	2.533	-0.182	-6.7%	37%

Table 7.16: Investment in other projects.

Final determination assessment for Projects related to other drivers

7.139 DWI has advised that the EU's recast of the Drinking Water Directive 98/83/EC has been ratified and that proposals for transposition into UK law





are being considered. At this stage we do not have any further information on exact requirements and timings and so we have not made any further adjustment to the baseline costs submitted for this project.

7.140 For the final determination we checked and confirmed that the Environmental Management System project cost aligned with the detailed cost estimates produced for the remedial work identified through site audits. The project cost has been allowed on this basis.

Final determination Summary for Projects related to other drivers

- 7.141 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines.
- 7.142 The final determination pre-efficiency allowances resulting from the adjustment described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
WTW - EMS	1.341	1.341	0.000	0.0%	59%
DWD Recast & Emerging Issues Study	0.283	0.283	0.000	0.0%	0%
Back-syphonage WTW	1.091	1.091	0.000	0.0%	19%
Total	2.715	2.715	0.000	0.0%	37%

Table 7.17: Investment in other projects.

SP04 Final determination overall summary

7.143 The following table summarises the outcome of the individual investment area assessments for sub-programme 04.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Investment in Annex A WTWs	27.959	19.594	-8.365	-30%	11%
Investment in other WTWs	3.136	2.952	-0.184	-6%	48%
Projects related to other drivers	2.715	2.715	0.000	0.0%	37%
Total	33.810	25.261	-8.549	-25%	18%

 Table 7.18: Summary of investment in SP04.



Sub-programme 05 – Water trunk mains

Background

- 7.144 NI Water proposed investment in 15 trunk main schemes with a preefficiency cost estimate of £53m. The drivers for the proposed schemes are:
 - To address supply demand deficits identified in the most recent Water Resource and Supply Resilience Plan.
 - To improve interconnectivity within and between water resource zones in the North and West which are largely dependent on individual small water treatment works. This will ensure that supplies can be maintained if a works is out of service for technical or raw water quality reasons.
 - To reinforce supplies in the areas served by Castor Bay Water treatment works.
 - To improve the resilience of supplies to service reservoirs in rural areas in the west where there is insufficient capacity to restore supplies quickly following an incident or secure supplies in periods of high demand.

Draft determination assessment of trunk main investment

- 7.145 We reviewed each scheme and challenged the scope and costings. In response to queries the company:
 - Agreed that the costs for crossings included in some schemes were too high and provided updated costs which have been included in the draft determination.
 - Provided a technical response to a challenge on comments on the scope of the proposed schemes including options for partial replacement of mains and the use of booster pumping. The company's response addressed the technical issues.
 - Agreed that costs on the Northern WRZ Resilience scheme had been duplicated in the Business Plan and provided a revised schedule of costs.
- 7.146 The estimates were prepared using the company's IPAC costing system. We applied a generic 6.7% reduction to all costs in the sub-programme to reflect the Reporter's comments on the application of risk in the costing system.



7.147 The allocation to base maintenance reflects the company's assessment. We took account of the increase in the capital maintenance element of this sub-programme relative to PC15 when determining the allowance of consequential capital maintenance

Utility Regulator

7.148 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Trunkmain - High Tober	1.284	0.869	-0.414	-32.3%	44%
Edenasop to Killeter SR	1.328	1.124	-0.204	-15.3%	29%
Blacklough to Crocknabohill SR	3.130	2.920	-0.210	-6.7%	0%
Woodend to Drain main	3.973	3.026	-0.947	-23.8%	0%
Castor Bay to Ballydougan Trunk Main September 2019	6.433	6.002	-0.431	-6.7%	45%
Trunkmain - Killyhevlin Cavanacross B	2.072	1.933	-0.139	-6.7%	41%
Trunkmain - Whitespots B	0.347	0.323	-0.023	-6.7%	30%
Caugh Hill, Carmoney to Strabane Strategic Link Watermain	18.204	16.984	-1.220	-6.7%	0%
Northern Resource Zone Resilience - Phase 4	1.234	1.152	-0.083	-6.7%	0%
Western Resource Zone - Resilience	2.793	2.606	-0.187	-6.7%	23%
Castor Bay Outage September 2019	4.314	4.025	-0.289	-6.7%	38%
Central WRZ Resilience and Supply	1.853	1.729	-0.124	-6.7%	0%
Trunkmain - Crescent Link	1.744	1.627	-0.117	-6.7%	44%
Trunkmain - Skeoge Link	1.811	1.690	-0.121	-6.7%	30%
Northern WRZ Resilience	2.500	0.000	-2.500	-100.0%	0%
Total	53.019	46.010	-7.009	-13.2%	17%

Table 7.19: Investment in trunk mains

Final determination assessment of trunk main investment

7.149 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines for the final



determination. We have made no further changes to our assessment since the draft determination.

7.150 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Trunkmain - High Tober	1.284	0.932	-0.352	-27.4%	44%
Edenasop to Killeter SR	1.328	1.205	-0.123	-9.3%	29%
Blacklough to Crocknabohill SR	3.130	3.130	0.000	0.0%	0%
Woodend to Drain main	3.973	3.243	-0.730	-18.4%	0%
Castor Bay to Ballydougan Trunk Main September 2019	6.433	6.433	0.000	0.0%	45%
Trunkmain - Killyhevlin Cavanacross B	2.072	2.072	0.000	0.0%	41%
Trunkmain - Whitespots B	0.347	0.347	0.000	0.0%	30%
Caugh Hill, Carmoney to Strabane Strategic Link Watermain	18.204	17.827	-0.377	-2.1%	0%
Northern Resource Zone Resilience - Phase 4	1.234	1.234	0.000	0.0%	0%
Western Resource Zone - Resilience	2.793	2.793	0.000	0.0%	23%
Castor Bay Outage September 2019	4.314	4.314	0.000	0.0%	38%
Central WRZ Resilience and Supply	1.853	1.853	0.000	0.0%	0%
Trunkmain - Crescent Link	1.744	1.744	0.000	0.0%	44%
Trunkmain - Skeoge Link	1.811	1.811	0.000	0.0%	30%
Northern WRZ Resilience	2.500	2.198	-0.302	-12.1%	0%
Total	53.019	51.135	-1.884	-3.6%	16%

Table 7.20: Investment in trunk mains





Sub-programme 06 – Service reservoirs and clear water tanks

Background

- 7.152 Service reservoirs are included in the water distribution network to balance short term water supply and distribution, typically over a day. The storage they provide limits the risk of large scale interruptions to supply due to failures of water treatment works, booster pumping stations and trunk mains. Clear water tanks (CWTs), located at water treatment works, serve the same general purpose. They hold the treated water before it is transferred into the network as well as providing contact time for disinfection.
- 7.153 The company has prioritised PC21 investment to focus on the expansion of one service reservoir and three clear water tanks. The investment included in the company's submission for this sub-programme and an explanation of how we have arrived at the individual assessments for the draft and final determination are detailed in the comments below.

Draft determination assessment of service reservoir and clear water tank investment

- 7.154 The company identified its investment requirements for this sub-programme by using a risk prioritisation model which assesses each of its storage facilities based on their resilience and the impact of any failure. The projects chosen are amongst those facilities that NI Water has determined carry the highest modelled risk. We recognise that shortcomings at these sites have the potential to result in interruptions to supply and loss of customer pressure which would be detrimental to both the company and its customers.
- 7.155 Following analysis of the business plan submission and the resulting query responses, we satisfied ourselves that the company had provided the necessary justification to show that investment was required at all of the service reservoirs and clear water tanks .
- 7.156 Analysis of the submitted data and cost models showed that the proposed investment was broadly in line with its historic spend in this area. A cost curve created from historic service reservoir and clear water tank data, which can be seen below, showed good correlation with the costs of the three new PC21 schemes, shown in red. We therefore allowed the costs for these schemes in full in the draft determination, subject to the generic Reporter adjustment.





Figure 7.1: SR and CWT cost model

- 7.157 The Drumaroad CWT project is carrying over from PC15 and the £0.55m submitted represents the cost necessary to complete the project. We therefore allowed this figure and did not apply the generic Reporter adjustment to this line of expenditure.
- 7.158 The table below provides a summary of the draft determination allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Loughmacrory Hill Service Reservoir	2.807	2.619	-0.188	-6.7%	1%
Fofanny CWT	3.240	3.023	-0.217	-6.7%	0%
Seagahan CTW	2.653	2.475	-0.178	-6.7%	1%
Drumaroad WTW CWT	0.547	0.547	0	0%	0%
Total	9.247	8.664	-0.583	-6.3%	0.6%

Table 7.21: Investment in service reservoirs and clear water tanks.

Final determination assessment of service reservoir and clear water tank investment

- 7.159 In line with the revised approach explained in Section 5, we have removed the generic reporter's adjustment from all programme lines for the final determination. This is the only change that has been made to the allowances for this sub-programme.
- 7.160 The final determination pre-efficiency allowances resulting from this adjustment are shown in the table below

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Loughmacrory Hill Service Reservoir	2.807	2.807	0	0%	1%
Fofanny CWT	3.240	3.240	0	0%	0%
Seagahan CTW	2.653	2.653	0	0%	1%
Drumaroad WTW CWT	0.547	0.547	0	0%	0%
Total	9.247	9.247	0	0%	0.6%

Table 7.16: Investment in service reservoirs and clear water tanks – Final Determination

Sub-programme 07 – Service reservoir rehabilitation

Background

- 7.161 Service reservoirs provide balancing storage for potable water in the course of distribution to consumers. Maintaining the integrity of service reservoirs to limit contamination from the ingress of water or soil is essential to maintain the quality of water supplied. NI Water undertakes a regular programme of reservoir cleaning, inspections and rehabilitation to ensure that water quality is maintained.
- 7.162 NI Water also needs to be able to bypass service reservoirs, particularly ones with only one cell, so that they can be easily isolated for essential maintenance work such as cleaning, inspection and rehabilitation without interrupting the supply of water to customers.
- 7.163 NI Water's submission for PC21 included for its ongoing programme of inspection and rehabilitation and for the provision of operational bypasses at the last seven service reservoirs where they do not currently exist.
- 7.164 The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment of investment in SR rehabilitation sub-programme

Service Reservoir Rehabilitation

7.165 NI Water introduced a risk based methodology in 2016 for assessing service reservoir refurbishment requirements which is based on the UKWIR Service Reservoir Toolkit. This has been aligned with the five year rolling



programme to clean and inspect every service reservoir, water tank, clear water basin and break pressure tank. This methodology should help prioritise and minimise investment by ensuring that capital maintenance interventions are only undertaken at assets that are considered to have failed or are considered likely to fail within the 5-year review period. It should therefore help avoid additional speculative refurbishment work that may have occurred in the past.

- 7.166 When we reviewed the company submission we found the budget allocation to be significantly higher than the projected outturn costs for PC15. When we queried this with the company it explained that this was because not all of the rehabilitation work identified through the condition assessments had been undertaken due to budget constraints. The significant reduction in annual expenditure reported by the company for the last three years of PC15 may be evidence of this. The change in methodology is however also likely to have had an effect, as expenditure in the early stages of the price control period will have been based on older methodologies and so will not have benefited from the more targeted approach now being adopted.
- 7.167 We requested specific details of the rehabilitation work undertaken in each year of PC15 to allow us to distinguish between the impact of the new methodology and the impact of budget constraints. This information was not provided in time for the draft determination, so we based projected expenditure on the average expenditure in the first three years of PC15. This resulted in an allowance which was 25% less than the company's submission. Whilst this approach was intended to help mitigate against the impact of budget constraints, we recognised that it was unlikely to have captured the full benefits realised through the new methodology. We indicated that we hoped to resolve this issue for the final determination once we received the information requested from the company. The generic Reporter adjustment was not applied to this programme of work as we based our pre-efficiency allowance on historic costs.

Service Reservoir bypasses

- 7.168 The company included investment to provide operational bypasses at the last seven service reservoirs where they do not currently exist. These are single cell reservoirs that can't currently be isolated easily for essential maintenance work such as cleaning, inspection and rehabilitation without risking interrupting the supply of water to customers.
- 7.169 The average cost of the seven schemes submitted for PC21 was found to be broadly comparable to the average cost of work undertaken in PC15. We therefore allowed the pre-efficiency costs subject to the generic Reporter adjustment.
Draft determination summary

7.170 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
SR Rehab Programme	17.203	12.919	-4.285	-25%	100%
SR Bypass - Lettermire SR	0.079	0.074	-0.005	-6.7%	43%
SR Bypass - Radergan SR	0.093	0.087	-0.006	-6.7%	65%
SR Bypass - Sheriffs Mountain SR	0.116	0.108	-0.008	-6.7%	75%
SR Bypass - Ballybriest SR	0.099	0.092	-0.007	-6.7%	66%
SR Bypass - Ballyleighery North SR	0.053	0.050	-0.004	-6.7%	66%
SR Bypass - Ballybarnes SR	0.048	0.044	-0.003	-6.7%	72%
SR Bypass - Gortilea Baranilt Road SR	0.029	0.027	-0.002	-6.7%	0%
Total	17.720	13.401	-4.319	-24%	99%

Table 7.22: Investment in service reservoir rehabilitation

Final determination assessment for SR rehabilitation

- 7.171 In the draft determination we advised that insufficient information had been provided to allow us to properly assess expenditure requirements for service reservoir rehabilitation in PC21. This included the impact of the new risk based methodology. So we noted our intention to undertake further analysis once appropriate cost and activity data had been received.
- 7.172 In its response to the draft determination, the company submitted further information and requested a slightly lower allowance than in the business plan submission. It indicated that it believed the revised figure of £15.69m represented a reasonable allowance despite being nearly 90% higher than the projected outturn costs for PC15. The company explained that this was because the PC15 programme had been constrained due to budget availability and that it anticipated it would need to rehabilitate four times as many service reservoirs in PC21.
- 7.173 We asked the company to provide the data which supported its draft determination response so that this could be checked. However, in response, the company advised that following further consideration it had decided that this analysis was no longer valid and should therefore be



ignored.

- 7.174 To inform our final determination, we asked the company to provide historic cost and activity data for all rehabilitation work undertaken in PC15. We asked for the latter to be broken down by six service reservoir size bands and by the type of assessment methodology used (i.e. old or new).
- 7.175 Consideration of this data, in conjunction with information on the number of inspections undertaken in PC15 and the asset inventory as a whole, allowed us to establish:
 - The average rate at which inspections result in interventions.
 - That the outturn unit rates for interventions were roughly the same irrespective of the assessment methodology used.
 - That the proportions of service reservoirs rehabilitated in each size band during PC15 was almost exactly the same as the proportion of the entire service reservoir asset stock that lay in each size band.
 - That a significant proportion of the interventions identified through inspections in PC15 had not been undertaken, explaining the relatively low projected outturn cost for the PC15 period.
- 7.176 For our final determination, we estimated the number of interventions that might be expected in PC21 by applying the PC15 inspection to intervention 'conversion' rate to the number of anticipated inspections. We then added in the backlog of work from PC15. We then applied the unit rates for rehabilitation work that had been estimated from PC15 activity to establish an appropriate allowance.
- 7.177 The outcome of our analysis produced a figure that was almost exactly the same as the company's original submission. So for our final determination we have allowed the submitted service reservoir rehabilitation costs in full.
- 7.178 In line with the revised approach explained in Section 5, we have also removed the generic Reporter adjustment from all the other programme lines.

Final determination summary

7.179 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
SR Rehab Programme	17.203	17.203	0.000	0%	100%
SR Bypass - Lettermire SR	0.079	0.079	0.000	0%	43%
SR Bypass - Radergan SR	0.093	0.093	0.000	0%	65%
SR Bypass - Sheriffs Mountain SR	0.116	0.116	0.000	0%	75%
SR Bypass - Ballybriest SR	0.099	0.099	0.000	0%	66%
SR Bypass - Ballyleighery North SR	0.053	0.053	0.000	0%	66%
SR Bypass - Ballybarnes SR	0.048	0.048	0.000	0%	72%
SR Bypass - Gortilea Baranilt Road SR	0.029	0.029	0.000	0%	0%
Total	17.720	17.720	0.000	0%	99%

Table 7.23: Investment in service reservoir rehabilitation

Sub-programme 08 – Water mains rehabilitation

Background

- 7.180 NI Water provides treated water to consumers through water distribution mains with an estimated total length of 27,000 km. The length of mains per property is approximately twice the average for water service providers in England & Wales, consistent with a consumer base distributed over smaller communities in a rural environment.
- 7.181 This sub-programme covers a planned programme of mains rehabilitation, including work associated with the removal of properties receiving low pressure. Other investment in water mains, including the provision of water mains in new developments, mains requisition and reactive repairs, are included in sub-programmes 10 and 23.
- 7.182 The investment proposals submitted by the company's for this sub-programme were broken down into four different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.





Draft determination assessment of investment in water mains rehabilitation sub-programme

Water main rehabilitation

- 7.183 Water main rehabilitation is the main budget line within this sub-programme. The business case proposed a budget of almost £93m for delivering 668km of mains rehabilitation plus an additional 92km for targeted mains renewal related to leakage reduction. The leakage element of the programme represents £10m of the budget.
- 7.184 We determined an appropriate capital budget allocation for this project by considering PC15 outturn costs, and the output from the company's DRRM analysis.
- 7.185 The company highlighted several risks associated with the DRRM analysis in its business plan submission, which we considered when establishing an appropriate unit rate for water main rehabilitation.
- 7.186 NI Water pointed out that the DRRM modelling creates numerous work packages comprising of short lengths of main, and that these would be inefficient to deliver. NIW suggested that it may be appropriate to increase the overall output length in our determination as a result. We stated that we would consider this further for the final determination.
- 7.187 NIW also noted that the overall reduction in mains rehabilitation length compared to PC15 represents a risk to serviceability. Our draft determination assessment of water infrastructure serviceability indicated that it was currently stable and we noted that it was forecast to remain stable throughout PC21 based on the company's submission. There was no evidence that suggested the rate of water main rehabilitation needed adjustment in the short term.
- 7.188 We did adjust the output from the DRRM analysis in the draft determination to account for the difference in size bands between mains delivered in PC15 and those predicted by the DRRM for PC21. We considered this appropriate as it reduced the risk of building up a 'bow wave' of investment for future years if only small diameter mains were replaced during PC21.
- 7.189 This adjustment also brought the DRRM unit rate into line with the PC15 outturn unit rate of £108/m. In general, where a robust recent trend of outturn costs exist, our starting point for projecting expenditure is to use historic rates recently achieved. We believed this was appropriate for this sub programme and so we based our draft determination allowances on a unit rate of £108/m.



7.190 The company confirmed the total length of mains associated with this project was 750.381km for the draft determination. This included the length of mains associated with targeted leakage reduction.

Utility Regulator

7.191 We applied our unit rate to this length of mains and added additional costs for service reservoir and M&E work to get our pre-efficiency allowance of £84.736m for this programme of work for the draft determination. This was 9% lower than the figure submitted by the company.

Low pressure development output

- 7.192 The Low pressure development output project covers the removal of 20 properties from the low pressure register through the rehabilitation of 14km of water mains. It also covers the work required to deliver a refresh of the DG2 Register, additional pressure logging, further network modelling and detailed analysis.
- 7.193 For the draft determination, we applied the water mains rehabilitation unit rate to the length of mains delivered by this project to determine a pre-efficiency allowance for PC21. This resulted in a figure that was 21% lower than the company submission. The tasks of refreshing the DG2 register, pressure logging etc. were included by the company in the Studies to inform project, so we did not allow them under this project.

DG2 low pressure

- 7.194 The DG2 low pressure project covers the installation and replacement of 22.8km of water mains, the installation of 39 new water pumping stations and the installation and adjustment of valves in the distribution system to address pressure issues. It was submitted in the business plan at a cost of £8.183m. The company adjusted the cost included for temporary pumping stations in response to one of our queries. This reduced the submission value from £8.183m to £7.889m.
- 7.195 In our draft determination, we applied the generic Reporter adjustment to this updated figure to establish our pre-efficiency allowance of £7.361m for the draft determination. This was 10% lower than the company's submission. Shortly before we finalised the draft determination we received additional information from the company enabling us to complete a bottom up assessment for this programme of work. We planned to adjust the allowance accordingly in our final determination when this work was complete.
- 7.196 The output length for the DG2 low pressure project was confirmed as 23.291km through our draft determination query process.





Studies to inform

- 7.197 The Studies to inform project covers a range of modelling outputs to enhance NI Water's network modelling capabilities at a cost of £6.647m. We identified that we needed further information on the build-up and justification for these costs for the final determination. For the purposes of the draft determination we allowed the submitted costs subject to the generic Reporter adjustment.
- 7.198 We noted that there was a risk that some of the consultancy costs associated with hydraulic and ad-hoc modelling may be embedded in other PC15 outturn unit rates as these tasks have been ongoing during PC15. We noted the potential for adjustments to account for this in the final determination.

Output length

7.199 We included all main laying activity identified in these programmes of work in the output length for this sub-programme in our draft determination. This resulted in a total length 788.122km aligning with the overall scale of the investment.

Draft determination summary

7.200 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the pre-efficiency allowances shown in Table 7.24 below.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Water mains rehabilitation	92.891	84.736	-8.155	-9%	51%
DG2 Low pressure	8.183	7.361	-0.822	-10%	2%
Low pressure development output	1.924	1.515	-0.409	-21%	54%
Studies to inform	6.647	6.202	-0.445	-6.7%	59%
Total	109.646	99.814	-9.831	-9%	48%

 Table 7.24: Investment in water main rehabilitation.





Final determination assessment of investment in water mains rehabilitation sub-programme

Water main rehabilitation

- 7.201 In its draft determination response the company agreed that the unit rate of £108/m was appropriate and we have continued to use this rate in our final determination.
- 7.202 In the draft determination, we noted that we would consider adjusting the length of water mains in the final determination if the company provided evidence to support this. In its response the company asked us to allow an increased total length for the sub-programme which was in line with the PC15 determination target of 905km. The requested length of 905km would equate to 868km for water main rehabilitation if the lengths associated with the low pressure projects are taken into account. The requested increase was informed by an updated DRRM model run which introduced parent lengths to account for the short intervention lengths produced by the model. The updated model run resulted in an output length of 838km.
- 7.203 For the final determination we have based our total target length for this sub-programme on the output from the updated DRRM model run. We consider this appropriate as it roughly equates to the projected actual outturn figure of around 830km for PC15, which has maintained serviceability. The allowed length of 838km equates to 801km for this project line if the lengths associated with the low pressure projects are taken into account. Applying the agreed unit rate of £108/m to this length gives a required allowance of £86.649m.
- 7.204 In our engagement with the company it also asked us to consider its asset inventory of water mains and in particular the age of its cohort of pre-1970 'brittle' PVC mains. It noted that this might result in the need for a significant increase in the length of mains requiring replaced in the medium term and suggested we allow for an increase in PC21 as a result. Our inspection of the inventory indicates that an increase linked to the deterioration of this type of main might be needed in the medium term. However there can be no certainty on either the timing or extent of this issue. We have therefore concluded that there is limited value in undertaking general replacement of mains before they have reached end of life. In taking this decision we also note that the company's business plan targeted 751km of mains rehabilitation while forecasting stable service and that we have already increased this length by 7% in the final determination.
- 7.205 For the final determination we have continued to allow £3.485m for additional costs relating to SR and M&E works. The total allowance for this project line





is therefore £90.134m.

Low pressure development output

7.206 We have maintained our draft determination approach to assessing costs for this project in the final determination. This allows for 14km of mains at the agreed unit rate of £108/m. The resulting allowance of £1.515m will enable the removal of 20 DG2 properties from the low pressure register. Delivery against this development output will be monitored in line with the requirements set out in Annex T of our final determination.

DG2 low pressure

- 7.207 For the final determination we completed a bottom up assessment for this project using information provided by the company in query responses.
- 7.208 For the 39 water pumping stations we used the company's base PC15 outturn unit rate of £103k. We then applied the company's business plan adjustments for risk, site investigation, power, land and consultancy support. Our estimated allowance of £5.251m is 3% lower than the figure of £5.394m submitted in the business plan.
- 7.209 We retained the company's estimates for the boundary valves (£3k) and water mains (£2,212k) and used the revised figure of £278k for temporary water pumping stations which the company had previously provided in a query response.
- 7.210 These changes result in a final determination allowance of £7.746m for this project.

Studies to inform

- 7.211 For the final determination, we asked the company for further supporting information on the build-up and justification for the costs included in this project so that we could move to specific assessments.
- 7.212 The submitted model build programme and ad hoc modelling support costs are in line with PC15 spend and we have accepted them on this basis.
- 7.213 We queried where the costs for trunk main model rebuild had been allocated in previous price controls to establish if they were embedded elsewhere in our determination. The company confirmed this is an additional requirement and it has been allowed on this basis.
- 7.214 We recognise the need to complete the DG2 register refresh and have confirmed that the submitted data logger cost is in line with existing unit



rates. We have accepted these costs on this basis.

- 7.215 Proactive lead communication pipe replacement funding has increased from the PC15 trend, but the company has explained the need for the increase, and we have accepted it on this basis.
- 7.216 We have transferred the funding for the transient modelling software from SP09 to this sub programme as requested by the company.
- 7.217 The remainder of the submission relates to approximately six full time equivalents to cover DG3 modelling, WQ modelling and chlorine decay modelling, Transient modelling, Network performance review and development of DG2 schemes. We asked the company for further justification of these investment requirements, including the build-up of the tasks and costs. As some are at the conceptual stages of development, the company was unable to provide any historic costs or additional information to support the estimates provided.
- 7.218 In the absence of robust supporting evidence we have reduced the funding to four FTEs. We did not exclude the funding entirely as we recognise some level of resource will be required for the delivery of these tasks in PC21 based on the need and justification provided.
- 7.219 The total allowance for this project has been determined to be £6.122m based on the assessments outlined above.

Output length

7.220 We have included all main laying activity identified in these projects in the target output length for this sub-programme. This results in a total length of 838km which aligns with the overall scale of the investment and the projected outturn figure for PC15.

Final determination summary

- 7.221 In line with the revised approach explained in Section 5, we have also removed the generic Reporter adjustment from all programme lines.
- 7.222 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Water mains rehabilitation	92.891	90.134	-8.155	-3%	51%
DG2 Low pressure	8.183	7.746	-0.822	-5%	2%
Low pressure development output	1.924	1.515	-0.409	-21%	54%
Studies to inform	6.647	6.122	-0.445	-8%	59%
Total	109.646	105.517	-9.831	-4%	48%

 Table 7.25: Investment in water main rehabilitation.

Sub-programme 09 – Leakage

Background

- 7.223 Some level of leakage is inherent in the operation of a pressurised water distribution network. While leakage represents a waste, both in terms of the water abstracted and the financial and social costs of treatment and distribution, NI Water must balance this against the cost of reducing leakage to determine an economic level of leakage. NI Water has prepared an economic level of leakage assessment for PC21 and has put in place plans to gradually reduce leakage to this economic level by the end of the price control period.
- 7.224 The investment included in the company's submission for this subprogramme and the outcome of our assessments for both the draft and final determinations are shown below. This includes an explanation of how we have arrived at the individual assessments.

Draft determination assessment of leakage investment

- 7.225 NI Water's business plan submission tables included a figure of around £15m for the 'leakage' element of this sub programme. In the sub programme documents submitted by the company, it advised that the cost entered should have been around £21m. This new total aligned with the detailed cost breakdown provided by the company and was therefore included in the draft determination.
- 7.226 The PC21 leakage total submitted to us in the business plan represented a significant step change in investment when compared to the PC15 allocation. The company maintained that this was necessary because it had found it difficult to reduce leakage in PC15 and had failed to meet its reduction targets.



7.227 When analysing the leakage submission for the Draft Determination, we identified that further evidence was required to justify the funding. The company has subsequently submitted additional information to us which has now been analysed.

Utility Regulator

- 7.228 We recognise that NI Water are investigating and pursuing new and innovative ways of reducing leakage. We appreciate the additional clarity that the company has provided in this regard following our queries on the original business plan submission. In the draft determination we advised that prior to the final determination we would seek further information on these initiatives to allow us to complete our assessments. For example, the project outcomes from the satellite imagery trial which was due to complete in the coming weeks. In addition, we advised we planned to review innovation projects more broadly at our PC21 mid-term review to ensure benefits are being delivered and investment for the second half of the price control period is warranted.
- 7.229 The company submitted an outline of their smart networks project which we have reviewed alongside their overarching strategy. We recognise the benefits that this could bring in terms of reducing the impact of interruptions to supply on consumers. However we noted that we would again be seeking further clarification on the costs and outputs submitted to allow us to make our final determination.
- 7.230 Due to the challenges the company has experienced throughout PC15 in reducing leakage, and the difficulties found when demonstrating value for money for any new initiatives, we believe there may be benefit in introducing regular update meetings during PC21. This would allow the outcome, effectiveness and benefits of new leakage strategies and initiatives to be discussed and assessed. In the draft determination we advised we would engage with the company on the detailed arrangements for these regular checkpoint meetings and confirm these in the final determination.
- 7.231 For the draft determination we allowed the funding requested subject to the generic report adjustment. We adopted this approach pending the receipt of the additional information and clarification noted above.

Draft determination summary

7.232 The table below provides a summary of the draft determination allowances for the leakage sub programme.



	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Leakage	21.010 ¹	19.602	-1.408	-6.7%	100%
Leakage Enhancement	7.801	7.278	-0.523	-6.7%	0%
Smart Networks	6.981	6.514	-0.408	-6.7%	0%
Total	35.792	33.394	-2.398	-6.7%	59%

Table 7.26: Investment in leakage control.

Final determination assessment of leakage investment

- 7.233 Given that the analysis of the Leakage submission was not complete at the time of the draft determination there has been extensive engagement with NI Water personnel in the intervening period as we have completed our assessment for the final determination.
- 7.234 In their response to the draft determination the company requested that we adjust the annual leakage targets for PC21 based on their projected outurn figure for PC15. We have accepted the revised profile on the basis that it still delivers the economic level of leakage in the final year of PC21. For further details refer to Outputs Annex E.
- 7.235 The requested PC21 allowance represents a significant step change in expenditure when compared to the PC15 allowance. The reasons for this were discussed in detail with the company. It has explained that this was because it had underestimated the funds required to deliver the target levels of leakage when submitting its business plan for PC15. Additionally, given the output of the SELL report and the overall PC21 target being set at a lower leakage level than the PC15 target, the company maintains that this increase in funding is necessary and appropriate.
- 7.236 The final figures submitted for the leakage and leakage enhancement project lines were £21.008m and £7.432m respectively. When assessing the appropriate allowance for the Leakage base and enhancement elements, we reviewed the information submitted and discussed each planned project line with the company. Through these discussions we established that the submissions were well thought out and fully understood by the company's leakage team. As a result we concluded that, with the exception of the acoustic logging enhancement project, the base and enhancement allocation requested was justified and this has been allowed in full. The acoustic logging project was reduced by £480k or 29%. This reduction was applied because the unit rate used by the company appeared excessive when

¹ IPAC total of £15.930m



judged against available comparative data.

- 7.237 Some of the leakage enhancement items are also subject to Development Outputs or have a proportion of their allocation dependent on a performance assessment at the midterm review. For example, the satellite imagery project which has an allocation of £1.5m over the PC21 period. We have allowed all of this funding in the final determination. However, half of the expenditure will be dependent on the company demonstrating at the midterm review that benefit has been derived from the project over the first three years of the price control. The same approach has been taken for the acoustic logging project line. Of the £1.2m that has been allocated to this project, £0.6m of the expenditure will be dependent on the company demonstrating the cost effective benefits that have been achieved during the first three years of PC21 at our midterm review. Annex T of our final determination lists our development objectives and sets out our expectations with regard to delivery, monitoring and reporting against the objectives as they progress.
- 7.238 In order for NI Water to demonstrate the benefits of each project line at the midterm review it is essential that it is able to disaggregate the detected leakage reduction in the first three years and attribute it to the relevant projects. We appreciate that this will be challenging and that the company may need to use a degree of estimation in doing so. This is because several different methods may have been used to detect the leak. The volume of leakage (and therefore financial impact) would therefore need to be split across the technologies and techniques used to detect it. However without attributing leakage reduction to each project line it will not be possible to quantify the estimated leakage benefit (and therefore cost benefit) of each technology or technique. We will also want to assess the effectiveness of the technologies under different conditions (urban/rural environment, material of water mains, etc.) and will want to see that the company is effectively managing and targeting leakage reduction for each.
- 7.239 As a consequence of the potential for removal of funds following the midterm review, the company will be expected to ensure that funding is still available for any essential services and operations that need to be undertaken in the second half of the price control period. It will therefore need to take account of this potential budget reduction at the midterm review to ensure it can finance essential activities in the remaining years of PC21.
- 7.240 In the draft determination we stated that we intended to hold regular leakage meetings with the company throughout PC21 and that we would engage with the company on the detailed arrangements for these regular checkpoint meetings and confirm these in the final determination. We have subsequently decided that we will liaise with the company in the first year of



PC21 and consider their proposed frequency and format of communications as delivery progresses.

- 7.241 Through our final determination assessments, we identified that there was an element of expenditure duplication between the Leakage and Metering sub programmes. This duplication relates to the potential rollout of smart meters under SP19 and the gathering of information for the 'Leakage factors and seasonal analysis (NHH analysis)' project line of the leakage sub-programme. The company has allocated £0.7m to the leakage project line as expenditure required to gather usage information from non-domestic customers to inform leakage calculations and understand customer flows over different seasons. This expenditure would not be necessary if the current dumb meter stock is replaced with smart meters in PC21. This is because the smart meters are capable of collecting customer readings similar to those that would be collected by the loggers placed on the network as part of the leakage project.
- 7.242 We have allowed the funding in the leakage sub-programme in the final determination but have removed £0.7m from the metering sub-programme to account for this duplication. The company will need to ensure the budget is allocated appropriately internally once it has determined where the funding is required.
- 7.243 The Smart Networks element of the leakage submission was entirely recalculated and resubmitted for the final determination as the company acknowledged that it had little confidence in the solutions, costs and quantities presented to us in its original submission.
- 7.244 This revised submission came to a total of £7.6m. It was analysed and discussed with the company on a line by line basis, similar to the rest of the sub programme. In general we had lower confidence in the smart networks element than the rest of the leakage sub programme submission. We felt that some of the expenditure lines that could conceptually bring about the most sizeable benefits could have had more planning and accuracy applied to them. Several project lines were excluded due to the absence of sufficient evidence that the project would be feasible or would deliver a benefit. We also undertook top-down and bottom-up assessments which resulted in similar levels of challenge to the submitted costs and applied a 25% reduction to the allocation requested by the company on this basis. We have not allocated funding to specific activities and expect the company to direct the funding to those it feels will be most beneficial once it has completed its evaluation of the individual initiatives/projects and their potential benefits. This project is a PC21 development objective and will be monitored and reported on accordingly. Further details of requirements can be found in our development objective annex (i.e. Annex T).





Final determination summary

- 7.245 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines in addition to making the adjustments described above.
- 7.246 This has resulted in a leakage sub programme final determination figure of £33.3m with a total of £1.4m of this being subject to the evidence required at the midterm review.
- 7.247 The final determination figure represents a reduction of £2.5m from the company's original business plan submission and £0.14m from the draft determination figure. This is summarised in the table below. It should be noted that budget figures in this table refer to the original business plan submission rather than the adjusted NI Water figures provided for analysis following query processes and resubmissions.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Leakage	21.010 ²	21.008	-0.002	-0.1%	100%
Leakage Enhancement	7.801 ³	6.952	-0.849	-10.8%	0%
Smart Networks	6.981 ⁴	5.299	-1.682	-24.1%	0%
Total	35.792	33.394	-2.398	-6.7%	63%

Table 6.21: Investment in Leakage control – Final Determination assessment

Sub-programme 10 – Ops capital (water)

Background

- 7.248 NI Water manages part of the delivery of its capital programme through its operational teams, which carry out smaller schemes to address immediate needs. Approximately half of the work focuses on minor capital maintenance of water assets. The enhancement element of the investment covers:
 - New connections to water supply;
 - Provision of water mains in new developments;
 - Lead communication pipe replacement where prompted by a failed water quality sample taken as part of the company's sampling

² IPAC total of £15.930m, revised final submission of £21.008m.

³ Revised final submission of £7.432m.

⁴ Revised final submission of £7.065m.





programme, or at the request of a consumer.

- 7.249 The base maintenance element of the allocation cover the costs required to maintain a stable service in relation to this sub programme. There are four base maintenance elements, including;
 - Water Supply
 - Water Networks
 - Networks Water (Civil)
 - M&E Water

These elements of the budget are used to assist in the maintenance of network assets and to support the water supply and network functions through the installation and maintenance of equipment as required.

7.250 The investment proposals submitted by the company for this sub-programme have been summarised into four different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Ops capital (water)

General

- 7.251 The company estimated its investment needs using projections of historic activities and costs and a bottom up assessment of need.
- 7.252 Given the reactive nature of many of the projects in this sub programme, our pre efficiency draft determination allowances were calculated based on historic PC15 expenditure and, where appropriate, forecasted volumes of customer connections for PC21.

Developer Services (Mains to Housing)

- 7.253 NI Water has a statutory obligation to provide new mains to housing and new connections to developers. The costs submitted by the company for these activities were based on historic spend in PC15 with an additional allowance for growth. The company had estimated this growth allowance on the basis of the trend seen in PC15 to date.
- 7.254 Our approach to this aspect of the sub programme was similar to the company's. Historic costs from the first 5 years of PC15 were increased in line with the projected volume of work for PC21.



7.255 The company was unable to provide information on the number of developments, or the meterage of mains laid for the developments in PC15 to date. Therefore, in order to estimate the volume of work in PC21 we used the increase in the forecasted number of new connections in PC21 compared to PC15 as a multiplier. The number of new connections was used to project costs because we found that there was a strong correlation between historic connection numbers and spend against developer services. We informed the company that the forecasted connection numbers would be reviewed prior to our final determination so that any variations to anticipated connection numbers at the end of PC15 could be taken into account.

Utility Regulator

7.256 Our analysis resulted in a minor reduction in allowance (-2%) when compared to the costs submitted by the company.

Reactive Lead

- 7.257 The reactive lead project is primarily driven by the Water Supply (Water Quality) Regulations for Northern Ireland. These regulations state that if a water sample has a lead concentration above the specified parameter (currently 10µg/l) then NI Water should replace its portion of the supply pipe or fittings which may be contributing to the lead levels as soon as is reasonably practicable. This project is largely reactive as it is either initiated when a water quality test reveals a lead failure, or at the specific request of a customer.
- 7.258 The company submitted a pre efficiency figure of around £2.9m to cover expenditure for this project. Given the difficulty in estimating future volumes due to the reactive nature of this work, we based our draft determination on the average historic spend over PC15. This resulted in a pre-efficiency allowance of around £2.2m, which was 24% lower than the company's submission.

New Connections

- 7.259 The company receives applications to connect from all new customers who require a connection to the potable water network. This project covers those connections that are less than 32mm in diameter. The majority of the connections are therefore for domestic premises. The company's business plan submission included a budget of around £18m for this project.
- 7.260 To determine an allowance for our draft determination we calculated a unit rate based on the costs and volumes from PC15. We then applied this unit rate to the forecast number of new connections submitted by NI Water in its business plan.
- 7.261 Our resulting draft determination pre-efficiency allowance of around £14.7m





represented an 18% reduction in expenditure when compared to the business plan submission.

7.262 We informed the company that the forecasted connection numbers would be reviewed prior to our final determination so that any variations to anticipated connection numbers at the end of PC15 could be taken into account.

Capital Water Base Maintenance

- 7.263 The expenditure under the base maintenance project is required to assist in maintaining a stable service to customers in PC21. This expenditure comprises various maintenance activities on the water network. The company submitted a total project cost of £21.3m as part of their business plan.
- 7.264 Our draft determination allowance was calculated on the basis of historic expenditure in PC15, consistent with the methodology applied throughout this sub programme. This resulted in a pre-efficiency allowance of around £24.4m which was 15% higher than the business plan submission.

Draft determination summary

7.265 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Developer Services	16.241	12.801	-3.440	-21.2%	0%
Reactive Lead	2.952	2.239	-0.713	-24.2%	0%
New Connections	18.001	14.762	-3.239	-18.0%	0%
Capital Water BM	21.288 ⁵	24.405	3.118	14.6%	100%
Total	58.483	54.208	-24.275	-7.3%	45%

Table 7.27: Investment in Ops capital (water)

Final determination assessment for Ops capital (water)

7.266 In the draft determination, we noted that we would adjust the developer services and new connection allowances in the final determination to reflect any revised projections of PC21 connection numbers provided by NI Water.

⁵ In IPAC this cost was separated into four sub elements (water supply, water networks, networks water – civil and M&E water) however for the determination we combined these elements as per the sub programme documents.



7.267 The company's draft determination response indicated that it agreed with the proposed approach. Therefore the estimated number of connections used for projecting PC21 allowances in the final determination was reduced from 44,400 to 42,678 as a result.

Utility Regulator

- 7.268 We also adjusted the unit rates used in our assessments to account for cost and activity data for 2019-20 which NI Water had submitted in its AIR20 annual information return. The same approach was applied to the reactive lead pipe replacement assessment.
- 7.269 The company asked us to apply a higher unit rate for connections which it said was reflective of a revised contract rate for this work. We have not done this as we do not consider it appropriate to make specific unit rate adjustments in isolation. This decision recognises the fact that many changes will have occurred since the submission and that over the investment programme as a whole these might be expected to balance each other out. The alternative would mean that we would have to identify and adjust for every variation that had occurred and this would not be practical.
- 7.270 The capital water base maintenance allowance has been assessed in the same way as in the draft determination and so has not changed.

Final determination summary

7.271 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Developer Services	16.241	12.618	-3.624	-22.3%	0%
Reactive Lead	2.952	1.904	-1.048	-35.5%	0%
New Connections	18.001	15.446	-2.555	-14.2%	0%
Capital Water BM	21.288 ⁶	24.405	3.118	14.6%	100%
Total	58.483	54.373	-4.110	-7.0%	55%

Table 7.28: Investment in Ops capital (water)

Sub-programme 12 – Sewerage

⁶ In IPAC this cost was separated into four sub elements (water supply, water networks, networks water – civil and M&E water) however for the determination we combined these elements as per the sub programme documents.





Background

- 7.272 NI Water proposed investment in sewerage schemes with a pre-efficiency cost estimate of £439m. The detailed plan included 173 individual project entries. This includes individual projects lines for each unsatisfactory intermittent discharge which will be grouped as catchment based schemes for delivery.
- 7.273 The key components of the programme are:
 - Drainage area solutions to improve environmental quality and release development constraints which comprise 64% of the total costs.
 - Capital maintenance schemes including sewerage rehabilitation and outfall maintenance.
 - Work to reduce the risk of internal property flooding.
 - Storm water separation and sustainable urban drainage pilot projects.
 - Planning works including integrated drainage planning and real time modelling of the sewerage network.
 - The installation of event duration monitors in critical locations agreed with NIEA.

Draft determination assessment of sewerage investment

- 7.274 We reviewed the business cases for a sample of drainage area schemes to assess the development of the outline solutions used to prepare the Business Plan and the scope of works costed. Developing solutions to unsatisfactory intermittent discharges in drainage requires detailed analysis to understand hydraulic capacity and environmental impacts. Once drainage area model outputs are available further catchment modelling can be used to optimise solutions and costs. Until this detailed work is complete critical issues such as volume of storage, the location and configuration of the plant, land acquisition and access arrangements cannot be resolved with confidence.
- 7.275 Our review of a sample of sewerage projects confirmed that modelling work had yet to be completed or updated for many PC21 projects when the Business Plan was submitted. Where this is the case, the Business Plan costings were based on existing models where possible supported by expert judgement.
- 7.276 Experience of previous price controls has shown that these major sewerage



projects are likely to be delayed and subject to cost increase as detailed solutions are developed. Since many of these projects will be delivered in the second half of PC21, there is an opportunity for the company to undertake further analysis and assessment before we finally determine an efficient cost for these projects. NI Water Business Plan included a development objective for the completion of this work

- 7.277 In view of need to undertake further work to confirm the scope and costs of sewerage and wastewater treatment schemes, we asked NI Water to provide the following by the end of November 2020:
 - A statement of the sewerage schemes where the scope is sufficiently well developed to allow them to be included in the final determination with confidence, with an explanation of why this is the case.
 - A programme of further study and development work necessary to confirm the scope and costs of the remaining sewerage schemes included in its Business Plan. We plan to use this programme to define a 'development objective' for PC21 which will allow costs and outputs to be confirmed or re-determined through the Change Control process in time for the work to be incorporated in the last three years of PC21.
- 7.278 We reviewed and challenged the estimates for the work proposed by the company in its Business Plan. We:
 - Applied a 6.7% reduction works priced through IPAC to reflect the Reporter's feedback on the costing system and risk.
 - Reduced the estimated cost of Event Duration Monitors by over 40% to reflect NI Water's costs of delivering similar work in PC15.
- 7.279 The allocation to base maintenance reflected the company's assessment. We took account of the increase in the capital maintenance element of this sub-programme relative to PC15 when determining the allowance of consequential capital maintenance.
- 7.280 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Drainage Area solutions	325.9	299.2	-26.7	-8.2%	10.3%
100% base maintenance shemes	40.2	37.5	-2.7	-6.7%	100.0%

Flooding schemes	22.1	20.6	-1.5	-6.7%	4.0%
Storm water separation and SUDs pilot	19.8	18.5	-1.3	-6.7%	3.1%
Integrated planning and miscellaneous	7.2	6.8	-0.4	-5.2%	0.8%
Event duration monitors	24.0	14.0	-9.9	-41.5%	22.0%
Total	439.2	396.7	-42.5	-9.7%	18.4%

Table 7.29: Investment in sewerage schemes

Final determination assessment of sewerage investment

- 7.281 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines for the final determination. We have made no further changes to our assessment since the draft determination.
- 7.282 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Total	439.2	427.6	-11.6	-3%	18%

 Table 7.30: Investment in sewerage schemes

Sub-programme 16 – Wastewater treatment works – new starts

Background

- 7.283 NI Water proposed investment in wastewater treatment schemes with a preefficiency cost estimate of £510m. The detailed plan included 73 individual project entries.
- 7.284 The key components of the programme are:
 - 50 schemes which will result in upgrades to wastewater treatment works and associated assets which will increase treatment capacity and contribute the release of development constraints.
 - Study work including marine modelling and integrated environmental modelling which will be used to optimise treatment solutions.



 A range of other targeted programmes of work across wastewater treatment including odour control, environmental management works, flow and event duration monitoring and sampling.

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Draft determination assessment of wastewater treatment investment

- 7.285 We reviewed a sample of the outline business cases for wastewater treatment included in the company's business plan. These ranged from detailed information based on development work in progress, to high level solutions worked up in some detail to scope an estimate to a simple statement of need with a supporting cost estimate.
- 7.286 The independent Reporter reviewed the methodology the company has adopted to determine future flows and loads necessary to size the works and the approach taken to size solutions. The works have been costed using IPAC and we have applied a 6.7% reduction to the estimates to reflect the Reporter's comments on the application of risk in IPAC. We will continue to review the scope of works and the estimates for the final determination.
- 7.287 The company has included a development objective for the further development of the LWWP programme treatment works in its Business Plan. The assessment of investment and tariffs in this draft determination is based on the straw-man solution estimates in subject to the risk adjustment described above. We will review and determine revised estimates from the company once work on the development objective is complete.
- 7.288 In view of the range detail of the business cases for other wastewater schemes in the of other Business Plan submission and the time the company has had to further develop solutions and estimates, we expect the company to provide the following by the end of November 2020:
 - A statement of wastewater treatment schemes where the scope is sufficiently well developed to allow them to be included in the final determination with confidence, with an explanation of why this is the case.
 - A programme of further study and development work necessary to confirm the scope and costs of the remaining wastewater treatment schemes included in its Business Plan. We will consider using this programme to define a 'development objective' for PC21 which will allow costs and outputs to be confirmed or re-determined through the Change Control process for works planned for the last three years of PC21.
- 7.289 While this approach is similar to that adopted for sewerage schemes, we



have greater confidence in the company's plans and estimates for wastewater treatment. We are minded to determine costs for the full PC21 period at the final determination for this work (excluding the LWWP) subject to further review of estimates.

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- 7.290 We have accepted need and scope of the investment for study work proposed by the company. We note the proposed development objectives linked to this work and expect the company to prepare a programme of work with outputs and delivery dates in advance of the final determination.
- 7.291 Other targeted works includes a range of work across wastewater treatment including odour control, environmental management works, flow and event duration monitoring and sampling. We have included the costs of this work subject to a more detailed review for the final determination.
- 7.292 The allocation to base maintenance reflects the company's assessment. We took account of the increase in the capital maintenance element of this sub-programme relative to PC15 when determining the allowance of consequential capital maintenance.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Wastewater treatment work schemes	456.3	426.1	-30.2	-6.6%	18.9%
Studies to inform future development	15.3	14.2	-1.0	-6.7%	14.3%
Other targeted works	38.1	35.6	-2.6	-6.7%	15.1%
Total	509.7	475.9	-33.8	-6.6%	18.5%

7.293 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

Table 7.31: Investment in wastewater treatment

Final determination assessment of wastewater treatment investment

- 7.294 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines for the final determination. We have made no further changes to our assessment since the draft determination.
- 7.295 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below. The increase in pre-efficiency investment is due to an increase in carry-over from PC15 which has been logged down in the PC15 out-turn adjustment.





	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Total	517.7	530.3	12.6	2%	18%

Table 7.32: Investment in wastewater treatment

Assessment of wastewater treatment investment

Sub-programme 17 – Small WWTW programme

Background

- 7.296 NI Water operates 775 small wastewater treatment works which serve a population equivalent (PE) of less than 250, with 308 of these serving a PE in the range 20-249. During PC15 the company has undertaken a rolling programme of upgrading works in the range of 20-249PE. The priorities for investment are agreed on an ongoing basis through regular engagement with NIEA. This programme of work has significantly reduced the number of works in this size band that do not comply with their descriptive consents. Projections submitted in NI Water's 2018-19 annual information return suggest that only around 20 to 30 works will be non-compliant at the end of PC15.
- 7.297 The company's PC21 submission proposed delivering improvements to a further 36 works in the 20-249PE size band during P21. Three of these are to be delivered through sustainable solutions. Although the total number of outputs proposed is higher than the number of works currently expected to be non-compliant at the end of PC15, it is recognised that additional works may cross the 20PE threshold during the period and that other works already within the range may become non-compliant. We have therefore accepted the total number of outputs proposed by NI Water for the purpose of estimating costs. We expect NI Water to continue to engage with NIEA on an ongoing basis to agree the investment priorities within this programme for PC21.

Draft determination assessment of RWwIP investment

7.298 The company submitted a prioritised list of works in its business plan which it indicated would form the basis of the PC21 investment programme. Our review of the submission however identified that the company had not adequately taken account of the distribution of these works by size when projecting its cost estimate for PC21 from PC15 data. This is important if projections are to account for changes in size distributions between price control periods due to material cost differences between large and small works.



7.299 To allow us to estimate PC21 allowances effectively we asked NI Water to submit details of its PC15 investment programme. We used the outturn data submitted to establish an average cost of delivery for works in 3 separate size bands (<50PE, 51 to 150PE and 151 to 250PE). We applied these unit rates to the number of works in each size category in the company's priority list. This produced an allowance which was around 45% lower than the company's submission.</p>

Utility Regulator

- 7.300 Following initial engagement on our estimate for PC21 the company provided the following supplementary information:
 - Revised inflationary uplift information for historic cost data. This was based on construction dates rather than beneficial use dates to ensure that the uplift applied aligned with the time the expenditure was actually incurred.
 - A revised priority list of works which the company advised was forming the basis of discussions with NIEA on the upgrades required for PC21.
 - Information to demonstrate that land purchase will be required at a greater proportion of sites in PC21 and to allow this proportion to be quantified.
 - An estimate of the cost uplift required for sites that require land based on an assessment of outturn costs from PC15.
- 7.301 NI Water indicated that it believed that 75% of PC21 schemes should allow for land and that the number of outputs for the price control period should also be increased from 36 to 47.
- 7.302 We reviewed the additional information provided by NI Water and accepted the revised inflationary uplift figures, the revised priority list and the company's estimate of the cost uplift for schemes that require land.
- 7.303 However our analysis of the additional information provided indicated that 60% was a more appropriate figure for the proportion of future schemes that might require land, rather than the 75% proposed by the company. We also did not see sufficient evidence to suggest that an increase beyond the original number of outputs included in the business plan was justified.
- 7.304 We therefore continued to use 36 works for assessing the PC21 allowance, assumed that 60% of these would require land and used the most recent list submitted by the company to estimate the proportional split of works by size prior to applying unit rates. This resulted in a draft determination preefficiency allowance which was 30% less than the company's submission as





detailed below.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Rural WwTW Programme	13.564	9.474	-4.090	-30%	18%

 Table 7.33: Investment in small wastewater treatment works – Draft determination assessment.

Final determination assessment of RWwIP investment

- 7.305 In its response to the draft determination the company stated that it agreed with the unit rates and the proportional split of works by size band that we had applied. It also said that it currently proposes to upgrade 36 works, including 3 sustainable solutions, which aligns with the original submission and the number of works allowed for in the draft determination.
- 7.306 The company disagreed however with our assessment of 60% for the proportion of future schemes that might require land, maintaining that 75% was a more appropriate figure. The company used this higher percentage to estimate a revised programme allowance of £9.87m for upgrading 36 works. This is £396k higher than our draft determination allocation.
- 7.307 In making its case for the higher land percentage, NI Water referred to the evidence it had provided prior to the draft determination and stated that it believed that our approach of combining the company's separate lists into one was inappropriate.
- 7.308 We disagree with the latter point. The company has submitted a single consolidated list which it states is forming the basis of ongoing discussions with NIEA in relation to the priority investment programme for PC21 and we would have expected the company to base its assessment of land requirements on this. It is therefore the company's approach of using 3 separate lists, generated on a different basis, containing different schemes to justify its percentage allocation which remains unclear. Our approach tried to address this issue by producing a single longer list of potential schemes which would allow us to read across the land requirements to the priority list being discussed with NIEA as far as practically possible.
- 7.309 This remains the approach we have adopted for the final determination. However in reviewing our draft determination we have realised that in the original submission NI Water had categorised 4 sites as 'unknown' with regard to land requirements. Our draft determination assessment had categorised all of these sites as not requiring land, which was not appropriate as some are likely to have land requirements. For the final determination we have therefore recalculated the land proportion. We have



taken a conservative approach by assuming that 75% of these 'unknowns' will require land, in line with the company's response. This has changed our estimate of the proportion of sites that might require land from 60% to 68%.

- 7.310 In addition, the company provided an updated version of the priority list that is being discussed with NIEA in its draft determination response. Land requirements were identified for all but 8 of the 46 schemes on the list. We have used this list to derive further estimates of works that might require land. In our initial analysis we again assumed that 75% (i.e. 6) of the 8 sites where requirements are unknown would require land. This assessment produced a figure of 67%. Adopting one of the company's alternative proposals of ignoring any sites at which land requirements are unknown produced a marginally lower figure of 66%. These figures are broadly similar to the corrected draft determination figure of 68% and so we have adopted a conservative approach and used the higher figure for the final determination.
- 7.311 In reviewing our analysis for the final determination we also identified that:
 - We had used an average figure from two assessment options to estimate the unit rate for works less than 50PE that require land rather than using the individual figure that aligned best with our final approach. We have corrected for this in our final determination which has increased this unit rate from £221k per site to £229k per site.
 - We had followed the company's approach of applying an average land uplift percentage derived from the combined information from all the size bands to estimate the higher unit rates for sites that require land in each size band. This was despite us having already estimated individual rates for each size band based on historic costs. This was unnecessary and will have introduced a bias in individual unit rates which does not reflect the planned investment profile. We have therefore corrected this in our final determination and applied the individual unit rates estimated from historic costs. The differences in the unit rates applied in the draft determination and the final determination for sites requiring land are detailed in the table below.

	DD Unit Rate for Sites requiring land	FD Unit Rate for Sites requiring land
Works <50PE	241,503	229,495
Works 51-150PE	335,001	334,457
Works 151-250PE	443,241	464,190

Table 7.34: Comparison of DD and FD rates for sites requiring land

7.312 The rates applied for sites not requiring land remain the same as in the draft





determination.

7.313 The application of the revised percentage and unit rates for sites requiring land, has resulted in a final determination pre-efficiency allocation of £9.530m as detailed in the table below. This represents a small increase from the draft determination figure of 9.474m and a reduction of 30% from the figure of £13.564m submitted in the business plan.

	BP Pre- efficiency	FD Pre- efficiency	FD Variance to BP	% change	FD Base Allocation
Rural WwTW Programme	13.564	9.530	-4.034	-30%	18%

 Table 7.35: Investment in small wastewater treatment works – Final determination assessment.

Sub-programme 18 – Ops capital (sewerage)

Background

- 7.314 NI Water manages part of the delivery of its capital programme through its operational teams which carry out smaller schemes to address immediate needs. The investment is dominated by minor capital maintenance of sewerage assets. The enhancement element of the investment covers new connections to the sewerage system and sewer adoption costs.
- 7.315 The investment proposals submitted by the company for this sub-programme have been summarised into three different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Ops capital (sewerage)

General

- 7.316 The company estimated its investment needs using projections of historic activities and costs and a bottom up assessment of need.
- 7.317 We analysed the submission and made our determination based on PC15 historic costs and, where appropriate, submitted forecasted volumes of work submitted by the company in its business plan.

Base maintenance

7.318 The base maintenance element of this sub programme is necessary to



undertake small scale remedial and repair works as well as the maintenance and replacement of assets and instrumentation through planned and reactive maintenance. The company submission included nine separate sub projects within this element of the sub-programme.

- 7.319 Due to differences between how historic costs were recorded and how the submission was broken down, we undertook our base maintenance analysis at total cost level. Due to the reactive nature of the project, our assessment was based solely on the average annual expenditure in PC15 on the basis this should provide a reasonable indicator of future expenditure. Our resulting pre efficiency project allowance of around £63m was 8% higher than that submitted by the company.
- 7.320 The reason for the increase was that the company's submission was incorrectly calculated using a nominal price base and we converted this to 2018-19 Prices.

Sewer Connections

- 7.321 NI Water has a statutory obligation to provide sewer connections to new developments. The expenditure under this project relates to the cost of sewer connections where the connection is less that 30m in length.
- 7.322 To determine the required expenditure for the cost of sewer connections, we calculated a unit rate per connection based on PC15 activity. This unit rate was then multiplied by the company's forecast of connection numbers in PC21. This resulted in an allowance which was 29% lower than the company's submission. We informed the company that the forecasted connection numbers would be reviewed prior to final determination to take account of activity rates at the end of PC15 and that this might impact the allowance for this project.
- 7.323 For the sewer connections element of this sub programme the company submitted a base/enhancement split of 32%/68%. We have amended this to 100% enhancement as we believe the full allocation should have been to Growth. The company confirmed that it agreed with this adjustment.

Developer services and sewer adoption

- 7.324 The developer services and sewer adoption allocation relates to the expenditure required to inspect sewerage assets constructed by a developer and adopt them into the NI Water network.
- 7.325 The company initially submitted this cost as part of sub programme 24 (New and Renew Sewerage). The company advised that this was done in error in one of its query responses and confirmed the costs should have been





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- 7.326 Our determination was based on the historic expenditure in this area during PC15 and took into account the change in the number of sewer connections forecasted for PC21. This resulted in a pre-efficiency allowance of £1.557m
- 7.327 We advised that the forecasted connection numbers would be reviewed prior to final determination to take account of activity rates at the end of PC15 and that this might impact the allowance for this project.
- 7.328 The company submitted information just before the draft determination requesting that additional costs be allocated to this area of expenditure due to changes in working procedures. We advised we would consider this request for the final determination.

Draft determination summary

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Ops Capital Sewerage BM	57.974	62.389	4.415	8%	100%
Cost of Connections Sewerage	10.804 ⁷	7.702	-3.102	-29%	0%
DSCT and Sewer Adoption	0 ⁸	1.557	1.557	N/A	0%
Total	68.778	71.649	2.871	4%	87.1%

7.329 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

Table 7.36: Investment in Ops capital (sewerage).

Final Determination Assessment for Ops capital (sewerage)

- 7.330 In the draft determination, we noted that we would adjust the developer services and new connection allowances in the final determination to reflect any revised projections of PC21 connection numbers provided by NI Water.
- 7.331 The company's draft determination response indicated that it agreed with the proposed approach. The estimated number of connections used for projecting PC21 allowances in the final determination was reduced from

 ⁷ IPAC costs submitted included nine separate sub projects within the base maintenance element of the sub programme. A determination was made against the sum total of these sub costs.
 ⁸ This cost was mistakenly included against SP24. The cost submitted there was £1.413m.



33,300 to 32,160 as a result.

- 7.332 We also adjusted the unit rates used in our assessments to account for cost and activity data for 2019-20 which NI Water had submitted in its AIR20 annual information return.
- 7.333 Although we did not make any further adjustment to the sewer for adoption allowance as requested by the company, we have allowed the full allocation as enhancement expenditure. If we had adjusted the purpose allocation for this allowance to align with that in PC15, we estimate that this would have resulted in a movement of £0.872m to base maintenance. If we had adjusted the allocation to reflect the purpose allocation as originally submitted in sub-programme 24 the full allocation of £1.5m would have moved to base maintenance. We therefore believe this still represents a reasonable outcome for the company.
- 7.334 The capital sewerage base maintenance allowance has been assessed in the same way as in the draft determination and so has not changed.

Final determination summary

7.335 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Ops Capital Sewerage BM	57.974	62.389	4.415	8%	100%
Cost of Connections Sewerage	10.804 ⁹	7.582	-3.223	-30%	0%
DSCT and Sewer Adoption	0 ¹⁰	1.504	1.504	N/A	0%
Total	68.778	71.475	2.697	4%	87%

 Table 7.37: Investment in Ops capital (sewerage).

Sub-programme 19 – Metering

Background

7.336 NI Water has around 70,000 non-domestic meters which it uses for billing purposes. These meters need to be maintained or replaced as they get older or malfunction to ensure that meter readings and therefore bills remain reasonably accurate. This programme covers the replacement of meters

 ⁹ IPAC costs submitted included nine separate sub projects within the base maintenance element of the sub programme. A determination was made against the sum total of these sub costs.
 ¹⁰ This cost was mistakenly included against SP24. The cost submitted there was £1.413m.



both as a result of reactive maintenance activities and through the proactive programme of replacement based on age.

- 7.337 The company installs new meters on newly built non-domestic properties and on existing non-domestic properties which previously didn't have a meter installed. The programme of works to install water meters on domestic properties ended during PC15 following changes to legislative requirements brought about by the Water and Sewerage Services Act (Northern Ireland) 2016. This decision was taken due to the absence of domestic billing in Northern Ireland.
- 7.338 This sub-programme relates only to meters for the purposes of billing customers and covers the majority of activities associated with maintaining, replacing and installing this meter stock. The costs associated with the repair and replacement of network meters (not used for billing customers) is recorded elsewhere.
- 7.339 The company's metering strategy for PC21 proposes the widespread installation of Smart meters as standard in Northern Ireland for the first time As opposed to the current practice of installing 'dumb' meters. The company has indicated that some of the meters will be fully capable smart meters while others, due to the remote location of the customer, will need to be AMR (automatic meter read) meters.

Draft determination assessment of Metering investment

Meter maintenance and repair activity (MMR)

7.340 Meter maintenance activity is reactive in nature and therefore the level of future activity cannot be easily predicted. Consequently we based our draft determination on PC15 historic costs and used annual averages for both unit costs and volumes of meters from the first four years of PC15 to project an allowance for PC21. This produced a figure which was marginally higher (3%) than the company's estimate.

Proactive meter exchange (PME)

- 7.341 NI Water's proactive meter exchange programme replaces all customer meters once they have either been in service for 17 years or have reached a high volumetric throughput. The company asserts that if a meter meets either of these criteria they no longer have confidence in its accuracy.
- 7.342 In order to determine a draft determination allowance for PC21 we obtained an extract from the company's meter database and calculated the number of meters that would have been in service for 17 years and therefore need to be replaced within the PC21 period. We applied an uplift to account for



meters that would need to be replaced because they are recording high volumes and then a reduction to account for meters which will already have been replaced through meter maintenance activity (as meters approaching replacement age are more likely to fail). We based both these adjustments on information provided by the company. A unit rate for PME installation was then applied based on outturn costs and activity volumes in the first 4 years of PC15. This resulted in an allowance which was around 16% lower than the company's submission. This difference was primarily due to NI Water not allowing for the overlap with the MMR activity in its calculations.

Selective and new non-domestic meter installations

7.343 To determine an allowance for selective installations and new non-domestic installations, we used the projected number of installations and connections submitted in the company's business plan and applied the average unit rates of installation from the first 4 years of PC15. This produced an allowance which was around 60% lower for selective installations and 70% lower for new connections. These variances resulted from the company using rates which were not reflective of PC15 actual outturn unit costs in its submission.

General meter purchase

7.344 The allowance for the purchase of meters for the above installations was determined by applying the rate submitted by the company for a 'dumb' meter to the total combined number of installations from the MMR, PME, selective install and new connection activities detailed above. Our allocation allowed for an estimate of the number of MMR jobs that would not need a meter to be fitted. This resulted in an allowance which was 13% lower than NI Water's submission. This difference was primarily due to the company allowing for fitting meters at all MMR jobs.

Smart meter installation for all business as usual activity

- 7.345 We recognise the benefits that Smart meters can provide in terms of efficiencies in meter reading activities and the provision of real time data which can help manage consumption and minimise leaks. We are also aware that non-domestic customers generally support the transition to Smart metering.
- 7.346 We therefore accepted NI Water's proposals to upgrade all business as usual meter installations to smart meters as this appeared to represent value for money based on the relatively low incremental cost. We estimated that adopting this approach would deliver a Smart meter penetration rate of just under 40% for all non-domestic meters by the end of PC21.



7.347 To determine the appropriate cost uplift required to fit smart meters we applied NI Water's uplift cost for installing a fully 'Smart' meter as this does not appear unreasonable. However we advised that for the final determination we would consider whether automatic meter reading installations should be subject to a different unit rate. Our determined allowance for this element of the programme was 15% lower than NI Water's submission. This was a result of our lower estimate of the number of business as usual meters required.

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Installation of additional Smart meters

- 7.348 NI Water also proposed replacing a further 22,000 'dumb' meters throughout PC21 in order to increase their smart meter penetration. These additional meter replacements would apply to meters that are still operational and functioning correctly. NI Water was therefore proposing to replace meters which were not 'life expired' in PC21 with Smart meters.
- 7.349 The cost associated with this additional programme of work was significant due to the high unit cost of each installation. It was estimated that around £6m would be required to replace these fully operational and serviceable assets (note that this differs from original submission figure of around £7.5m due to a significant element of double counting). This estimate included around £1m for the installation of enabling IT technology and systems. The company tried to justify this additional expenditure by linking it to Opex cost savings and submitted a simple payback analysis which showed the cumulative return becoming positive towards the end of PC27 to support this. However the cost benefit analysis submitted did not appear to be correct as it did not align with proposed activity levels during PC21.
- 7.350 We undertook a separate cost benefit analysis which suggests that, if the company continue to replace and install only the meters required (i.e. excluding the additional 22,000), the cumulative return would become positive at the start of PC27 rather than the end, as NI Water's analysis had showed. This earlier net positive would be achieved due to the comparatively lower capital outlay required and appeared to represent better value for money. In the draft determination we concluded that adopting this policy would avoid the early replacement of fully operational and serviceable assets and would still deliver Smart meter penetration rates of around 93% by the end of PC27 which we considered reasonable.
- 7.351 We therefore excluded the additional smart meter replacement activity and associated costs in the draft determination on the basis that it was not cost beneficial but included a proportion of the enabling IT costs to support the installation of 28,000 Smart meters through business as usual activity.

Draft determination summary

7.352 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Metering - Meter Maintenance	5.710	5.896	0.187	3%	100%
Metering - Proactive Meter Exchange	3.538	2.974	-0.564	-16%	100%
Metering - Selective Installations	0.299	0.133	-0.166	-56%	0%
Metering - Non Domestic New Connections	0.333	0.104	-0.230	-69%	0%
Metering - General Meter Purchase	0.570	0.494	-0.076	-13%	100%
Smart Customer Meters for SP19 Metering Programme	0.985	0.842	-0.143	-15%	0%
PftF - Smart Metering	7.455	0.482	-6.973	-94%	40%
Total	18.889	10.924	-7.966	-42%	87%

Table 7.38: Investment in metering – Draft Determination

Final determination assessment of Metering investment

- 7.353 The company responded to the draft determination with several comments and resubmissions. These have been taken into account when establishing an allowance for the final determination. The relevant comments and our analysis of the new information is explained below.
- 7.354 NI Water agreed that the selective installations rate used in the draft determination (£221) was correct and that their rate of £498 was not reflective of actual rates in PC15. Furthermore they agreed that the determination rate of £43 for new metering connections was correct and that their business plan rate of £179 was also not reflective of PC15.
- 7.355 The company stated that they had underestimated the number of Proactive Meter Exchange (PME) jobs that were required in their original submission and subsequently our draft determination number also needed to be increased. This underestimation was based on an assumption made by the company that the number of PME replacements based on high usage was 5% of the total number of PME jobs, a total of 762 meters.
- 7.356 Following the draft determination, NI Water assessed the number of PME


replacements required in PC21 based on the annual usage of meters. It forecasted those that would reach the PME replacement threshold of 8000m³ in PC21. The company determined that the number of volumetric replacements should have been 6,622 and not 762 as they originally specified. We have checked their analysis and agree that the bottom-up assessment based on usage is a more appropriate methodology to derive a suitable number of meters. However we have adjusted the methodology slightly and used an average of all the years consumption by each individual meter rather than focussing on the last year's consumption. This resulted in a lower estimate of 5,576 additional PME meters which we have used for the final determination rather than the 5% included at the draft determination stage. This has increased both the number or meters and the number of PME installations.

- 7.357 NI Water also informed us that in their original submission they had forgotten to include meters free issued to other teams within the company. The company requested that an additional 6,881 meters, plus £106,000 of ancillary equipment be added to the determination. We reviewed the relevant information submitted in this regard and included the additional costs associated with the free issued meters and the ancillary equipment. This increase in cost relates only to the cost of the meters and ancillary equipment itself. The cost of the installation of these assets is covered elsewhere in the determination.
- 7.358 The addition of the free issued meters and the extra PME meters results in a total meter installation count of 39,226 for the final determination. This represents a significant increase on the draft determination figure of 28,064.
- 7.359 The unit rates used for the purchase of meters were updated for all meter sizes for the final determination. This brought the cost of the smaller diameter meters down and increased the cost of some of the larger diameter meters. The new rates were taken from query response information submitted by the company and represent their new contract rates.

Smart Metering

7.360 The company submitted an entirely new smart metering project proposal for the final determination. This was an extensive submission which focussed on the replacement of the current dumb meter stock with smart meters and included several scenarios of different replacement numbers. The scenario that NI Water recommended was the replacement of all NHH customer meters currently installed on the network. This amounted to the replacement of c. 71,000 meters which the company intended to replace by the summer of 2023 over a period of approximately 15 months. A target which the company maintains is achievable at a cost of £18.5m.



7.361 The smart metering proposal included a cost benefit analysis undertaken over the predicted 10 year operational lifecycle of the smart meters. The analysis presented by NI Water showed that the fewer smart meters that were installed in PC21, the faster the payback period. The benefits associated with the project centred on the potential operational efficiencies achieved through the automatic collection of usage data. We acknowledge the company's efforts to reduce operational costs in this regard and encourage the further investigation of any initiatives that may do so.

Utility Regulator

- 7.362 One of the concerns that we had with the smart metering submission was the lack of transparency regarding its interconnectivity with the rest of the metering sub programme. The £18.1m smart metering project proposal only related to one of the four types of customer meter installation costed for in this sub programme (i.e. PME replacements). The company indicated that they felt that the other three installation and replacement work-streams would be unaffected by the project. We fundamentally disagree that the number of meter replacements undertaken in PC21 through the MMR workstream, which replaces broken water meters, would be unaffected by the replacement of all existing meters with brand new assets in the first two years of the period. We also received no estimation of the unit cost impact on the other customer meter work-streams which would also presumably be installing smart meters rather than dumb meters and may also incur additional data communications costs. In addition, NI Water did not provide a revised estimate of the total cost of the sub-programme if their recommended smart metering scenario was approved. By taking into account all smart metering implications on all the associated sub programme work-streams we estimated a total revised submission of approximately £26.2m. This would represent a significant increase on the original business plan submission of £18.9m and the draft determination allowance of £10.9m.
- 7.363 We felt that the smart metering submission lacked several key pieces of information and analysis that prevented us from having confidence in any of the scenarios. One of the key omissions was a longer term cost benefit analysis. We felt that this was necessary as smart meters incur a substantially higher cost than their dumb meter counterparts and also require replacement more frequently. It is also necessary due to the fact that not all smart meter setup costs will likely be incurred at each asset replacement cycle, therefore the longer term costs and benefits could be significantly different to the costs that are included at the project setup. We also felt that further investigation needed to be done into the communications costs and connectivity issues, as the rural nature of Northern Ireland could lead to these estimated costs being significantly different from those experienced elsewhere. In addition the company stated in a query response that they found it difficult to comment on their confidence levels regarding achieving



Utility Regulator

- 7.364 Given our concerns regarding the delivery of the project, the potential inaccuracy of the project costs and the lack of confidence in the benefits, we concluded that we could not have confidence in any of the scenarios. We therefore decided that a smart metering allowance should be included in PC21 only for the number of meters being replaced or installed in a business as usual capacity. The smart metering uplift calculated for the number of meters being replaced in PC21 is c. £2.5m.
- 7.365 We also agreed with the company that a review of the benefits of smart metering should be undertaken at the PC21 midterm review, at which point NI Water will submit to us a longer term cost benefit analysis with more robust data, as well as three years of experience in the installation and management of smart meters. Further information regarding this can be found in the Annex T of the final determination which lists the PC21 development objectives and our expectations in terms of monitoring and reporting on delivery. If, at the midterm review, we do not feel that the company has alleviated our concerns or been able to prove the long term benefit of smart meters. This would result in a removal of c. £0.9m of funding from this sub programme for the remainder of the price control.
- 7.366 As a consequence of the potential for removal of funds following the midterm review, the company will be expected to ensure that funding is still available for any essential services and operations that need to be undertaken in the second half of the price control period. It will therefore need to take account of this potential budget reduction at the midterm review to ensure it can finance essential activities in the remaining years of PC21.
- 7.367 There was a £0.7m duplication of costs identified between the smart metering project and the leakage sub programme. This duplication results from one of the leakage projects aiming to collect data on NHH customer's water usage to enable the company to forecast and account for its water balance more accurately. If the smart metering project goes ahead then we believe that the data collected through smart metering would be sufficient to inform the leakage team's calculations. We have therefore deducted £0.7m from the smart metering project in the final determination. It has been deducted here because the smart metering project may not be completed (if the midterm review submission is unsuccessful). In this event the leakage team will still require the information to be collected from NHH users and therefore the funding. The company will need to ensure the budget is allocated appropriately internally once it has determined where the funding is



required. The deduction of this funding has reduced the smart metering uplift from c. ± 2.5 m to c. ± 1.8 m.

Summary of final determination

- 7.368 The costs of many of the individual elements of this sub programme have changed since the draft determination. This is largely a product of new information being presented to us by the company. It has resulted in an overall increase in the draft determination allowance of c.£1.5m to a final determination figure of £12.456m.
- 7.369 The final determination allowance for the metering sub-programme is shown in the table below. It is important to note that the business plan pre-efficiency figures shown in the table below are significantly understated when compared to the more recent submissions from the company.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Metering - Meter Maintenance	5.710	5.896	0.187	3%	100%
Metering - Proactive Meter Exchange	3.538	3.797	0.259	7%	100%
Metering - Selective Installations	0.299	0.133	-0.166	-56%	0%
Metering - Non Domestic New Connections	0.333	0.104	-0.230	-69%	0%
Metering - General Meter Purchase	0.570	0.729	0.159	27%	100%
Smart Customer Meters for SP19 Metering Programme	0.985	1.372	0.387	39%	0%
PftF - Smart Metering	7.455	0.425	-7.029	-94%	40%
Total	18.889	12.456	-6.434	-34%	85%

Table 7.22: Investment in metering – Final Determination

Sub-programme 20 – Management & General

Background

7.370 The category of 'management and general' covers the capital assets required to support the general delivery of services which are not directly related to the operational water and sewerage service assets. It includes the provision and maintenance of general facilities and accommodation, vehicles, information technology (including hardware and software) and the



updating of network records.

Assessment of Management and General Investment

Draft Determination Assessment of 20a: PC15 Carryover

- 7.371 This programme of work covers the completion of two unfinished projects from PC15. One of the projects is for the completion of a clean water hydraulic model rebuild (£50k) and the second is for the procurement of a service provider to implement deterioration modelling (£161k).
- 7.372 Given the need for NI Water to complete work which began during PC15, we allowed the amount of £211k as requested and did not apply the generic reporter adjustment.

Final Determination of 20a: PC15 Carryover

7.373 NI Water made no further comments relating to our draft determination, therefore the funding remains unchanged at £0.211m

Draft Determination Assessment of 20b: Analytical Services Resilience

- 7.374 NI Water currently operate two laboratory facilities. One is located at Gelvin Grange, Londonderry and is tasked with carrying out analysis of waste water and trade effluent samples. The other facility is located on the Westland campus and is tasked with the analysis of clean water samples.
- 7.375 In its business plan submission, NI Water made the case that both labs are in a sub-optimal condition and no longer fit for purpose without significant investment.
- 7.376 The company considered a significant number of options in its business case including, consolidation of facilities at one site, construction of two new facilities and refurbishment of the existing facilities. NI Water concluded that the optimum solution is to build a new clean water facility at Westland and convert the existing garage space at Gelvin Grange into a new wastewater lab facility.
- 7.377 The selected option is not the least cost solution but was chosen because:
 - a) It allows construction of the new facilities without disrupting current operations.
 - b) Retaining two lab facilities provides redundancy in the event of closure of one facility.



c) Equipment currently in use will provide spare parts when the new facilities become operational.

Utility Regulator

- 7.378 The evidence of the need for new lab facilities was well documented and justified. The decision to retain two sites, although not the least cost option, appeared to be the most advantageous from an operational standpoint and has the support of other key stakeholders.
- 7.379 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	FD Base Allocation
ASR – New lab buildings	13.438	12.538	-0.900	-6.7%	35%
ASR – ICT & lab equipment	2.202	2.054	-0.148	-6.7%	35%
ASR – Temporary Staff	0.827	0.772	-0.055	-6.7%	35%
Total	16.467	15.364	-1.103	-6.7%	35%

Table 7.39: 20c Investment in Analytical Services Refresh

Final Determination of 20b: Analytical Services Resilience

7.380 NI Water has accepted our draft determination and we have removed the generic Reporter's adjustment. The final determination allowance for this element of the sub-programme is detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
ASR – New lab buildings	13.438	13.348	0.000	0%	35%
ASR – ICT & lab equipment	2.202	2.202	0.000	0%	35%
ASR – Temporary Staff	0.827	0.827	0.000	0%	35%
Total	16.467	16.467	0.000	0%	35%

Table 7.40: 20c Investment in Analytical Services Refresh

Draft Determination Assessment of 20c: Base/Refresh

7.381 Sub-programme 20c consists of a number of projects which cover the business-as-usual replacement of obsolete/end-of-life assets and renewal of software licences.

ICT Base/Refresh

7.382 NI Water relies heavily on its ICT network, assets and server infrastructure to



conduct its business. ICT systems are critical for enabling the workforce to deliver essential services to customers in an efficient manner. ICT systems are also essential for ensuring NI Water meets its legislative and environmental responsibilities.

Utility Regulator

- 7.383 This sub-programme is broken down into 17 separate projects, most of which involve the replacement of obsolete or end of life equipment.
- 7.384 The company's business plan submission proposed expenditure of £11.49m classified as 90% base and 10% enhancement. We believe that the expenditure should be classed as 100% base maintenance because, although new equipment may provide some minor additional benefits in terms of functionality, the customer will not receive a noticeable improvement in service. We also disallowed the requested innovation funding of £0.6m, as this appeared to be a subset of contact management in Planning for the Future.
- 7.385 Our pre–efficiency allowance of £10.889m was broadly in line with PC15 expenditure on ICT Base of £11.2 but around 5% lower than the company's submission.

ICT – Telemetry, Telecoms & SCADA

- 7.386 NI Water's operational telecommunications system is an enabler for;
 - a) SCADA (Supervisory Control and Data Acquisition): provides signals to allow processes to be remotely controlled.
 - b) Telemetry: transmission of data from remote locations to allow real time decision making.
 - c) Telecoms: Internal phone system and radio repeaters.
- 7.387 The equipment used to provide the above systems has a finite life span and is replaced on a rolling programme basis. We would therefore not expect to see significant variations in costs between price control periods.
- 7.388 The business plan for PC21 was broken down into 11 separate projects, most of which involved the replacement of obsolete or end of life equipment at a total cost of around £15m.
- 7.389 The company's business plan submission categorised the expenditure as 90% base and 10% enhancement. As with ICT – Base, we believed that this expenditure should be allocated entirely to base maintenance. This is because NI Water was unable to quantify any service enhancements in its business plan submission. So although the new equipment may provide some minor additional benefits in terms of functionality, it appeared that the



customer would not receive any noticeable improvement in service.

7.390 NI Water informed us during the query process that the expenditure in PC15 was £20.7m, but the majority of the projects were not listed in table 3.3. We were only able to identify expenditure of £12.5m during PC15 and based our determination on this figure. This was 16% lower than the company's submission.

Fleet

- 7.391 NI Water has a fleet of 589 vehicles, which service the various needs of different functions within the business. It covers a broad range of vehicle types, including 4x4s, vans (small, medium and large), lorries and other specialist vehicles. The vehicles are renewed on a rolling basis to keep the volume of less efficient, overage vehicles at an acceptable level.
- 7.392 In its business plan submission, NI Water requested a sum of £20.414m. This was later reduced to £15.307m as a result of an internal challenge. The purpose of the funding is to replace vehicles on a like-for-like basis in the first 3 years of PC21 and introduce alternatively fuelled vehicles (i.e. electric vehicles) in the last 3 years of the price control period. The move to electric vehicles brings with it the additional problems of requiring the installation of charging infrastructure which is dealt with in section 20f - Planning for the Future.
- 7.393 NI Water classified the expenditure on fleet as 50% base, 50% enhancement. There was a difference in unit costs between conventionally fuelled vehicles and alternatively fuelled and it was this difference that we allowed as enhancement. We therefore changed the split to 89% base and 11% enhancement.
- 7.394 Our assessment indicated that all options might not have been explored by the company. For example, Biodiesel is not yet available in Northern Ireland but may be a viable option in the near future. If this were the case, it would defer the need to invest in any additional charging infrastructure. Given the extent of uncertainties and the speed of developments in this area, we did not believe that it would be appropriate to allow investment for a wholesale move to electric vehicles during PC21 at this stage. However, we recognised that commercial vehicles have a finite economic lifespan and must be replaced accordingly. We therefore included a pre-efficiency allowance of £13.733m in the draft determination with the caveat that the actual funding requirements for the final three years of the price control be assessed and determined at the PC21 mid-term review. Our allowance was 10% lower than the company's submission.



20c: Other

7.395 We included a pre-efficiency allowance of £15.967m for the remaining projects in this programme which represented a 20% reduction against the company's submission of £20.076m. We largely based our allowance on the projection of historic run-rates as there was no compelling evidence submitted to justify why this should increase. We disallowed the CPMR Replatform project as the need to complete this project in PC21 has not been demonstrated. We advised we would consider this further for the final determination if the company could provide additional evidence to support this investment.

Draft determination summary for 20c: Base/Refresh

7.396 The outcome of our assessments for the draft determination resulted in the following pre-efficiency allowances

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Lab Info Management System (LIMS)	0.150	0.140	-0.010	-6.7%	100%
Asset Management Plan (NIAMP6)	4.269	3.416	-0.853	-20%	100%
Automatic Sampling Machines	0.297	0.100	-0.197	-66%	100%
ICT Base/Refresh	11.489	10.889	-0.601	-5%	100%
ICT Telemetry, Telecoms & SCADA	15.011	12.600	-2.411	-16%	100%
Fleet	15.308	13.733	-1.575	-10%	89%
Capital Programme Management & Reporting (CPMR)	0.601	0.407	-0.193	-32%	70%
CPMR Re-platform	1.401	0.000	-1.401	-100%	100%
Deterioration Risk & Reliability Model (DRRM)	1.501	1.092	-0.409	-27%	80%
Cyber Resilience	5.441	4.900	-0.541	-10%	0%
Oracle Re-platform	2.915	2.400	-0.515	-18%	90%
Renew CBC Contract	3.501	3.266	-0.235	-6.7%	100%
Total	61.884	52.943	-8.941	-14%	88%

Table 7.41: 20c Investment in base/refresh





Final Determination Assessment of 20c: Base/Refresh

NIAMP 6

7.397 We allowed £3.416m in the draft determination based on provisional PC15 outturn expenditure. NI Water's response indicated that it believed outturn expenditure could be in excess of £5.0m. As a point of principle, we stated that we could not allow more than was requested in the business plan, without making adjustments for all other cost variations that had occurred in the investment programme in the interim . We however increased the funding in the final determination to that which was originally requested (£4.269m) as this is roughly the same as the most recent outturn projection provided in the company's latest annual information return.

Fleet

- 7.398 NI Water disagreed with our draft determination and provided further information regarding its gradual move to alternatively fuelled vehicles. It stated that the funding allowed in the draft determination would not allow sufficient volume of alternatively fuelled vehicles to be purchased given the relatively high purchase prices.
- 7.399 We revisited our draft determination assessment and using the additional data supplied by NI Water, satisfied ourselves that its strategy to move to electric vehicles is appropriate. We also found that we had omitted the costs of vehicle fit-out and new in-cab technology. We, therefore, factored these costs into the final determination.
- 7.400 NI Water provided current pricing data for small, medium and large panel vans from its procurement partner, Crown Commercial Services. When these prices were included in our assessment, the original business plan request of £15.308m was shown to be reasonable. We have therefore allowed it in full in our final determination.

CPMR

7.401 We increased this allowance from £407k to £427k by adding in the previously disallowed consultancy and contingency costs. We allowed these costs on other projects and followed a consistent approach

CPMR Re-platform

7.402 NI Water wish to upgrade Microsoft ASP which, it claims, Microsoft will cease supporting during PC21. Although the software is still serviceable, continuing use increases internal costs and draws resources away from



other priorities. It may also result in higher security risks.

7.403 For the final determination we decided to allow the funding to ensure NI Water is operating with the most up-to-date system which provides maximum cyber resilience. We however changed the purpose allocation to 100% base maintenance.

DRRM

7.404 Although our assessment of DRRM has not changed for the final determination it is worth noting that part of the allowance in sub-programme 20a is for completion of models carried over from PC15 (£161k) and this brings the total DRRM allowance to £1.253m

Cyber Resilience

- 7.405 NI Water based its business plan on a report completed by Deloitte. The recommendations contained within the Deloitte report have informed NI Water's submission around the types of investment it needs to make to bring it in line with required regulatory standards for cyber resilience, particularly around operational technology.
- 7.406 NI Water have opted not to fully implement the recommendations contained within the Deloitte report, where they consider the costs of implementing the recommendation outweigh the incremental benefit in terms of enhanced security or resilience.
- 7.407 Although the total quantum of capex spending proposed by NI Water in its submission is broadly in line with the recommendations within the Deloitte report, NI Water did not formally document how the total sum was put together. As such we have not been able to trace the estimates back to specific figures within the report or elsewhere. We are however assured that there are no systematic biases in NI Water's estimates for cyber resilience and, although the lack of documentation makes it challenging to evidence the efficiency of NI Water's cost estimates, on balance, we are assured of the appropriateness of NI Water's proposed spending levels.
- 7.408 Therefore, we have decided to allow funding in full as per the original business plan request.

Oracle Re-platform

7.409 In its response to our draft determination, NI Water identified a significant reduction in the cost required to re-platform Oracle. This reduction is in lieu of the £1m allowed for "data centre refresh" in ICT Base/Refresh section of this sub-programme. Our consultants, CEPA informed us that "We do not





consider it appropriate to provide a separate allowance for remote servers if, as we understand, an allowance for the data centre has already been provided."

7.410 We accepted our consultant's recommendation and reduced the allowance accordingly.

Final determination summary

7.411 The outcome of our assessments for the final determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Lab Info Management System (LIMS)	0.150	0.150	0.000	0%	100%
Asset Management Plan (NIAMP6)	4.269	4.269	0.000	0%	100%
Automatic Sampling Machines	0.297	0.100	-0.197	-66%	100%
ICT Base/Refresh	11.489	10.889	-0.601	-5%	100%
ICT Telemetry, Telecoms & SCADA	15.011	12.600	-2.411	-16%	100%
Fleet	15.308	15.308	0.000	0%	89%
Capital Programme Management & Reporting (CPMR)	0.601	0.427	-0.174	-29%	70%
CPMR Re-platform	1.401	1.401	0.000	0%	100%
Deterioration Risk & Reliability Model (DRRM)	1.501	1.092	-0.409	-27%	80%
Cyber Resilience	5.441	5.441	0.000	0%	0%
Oracle Re-platform	2.915	0.962	-1.953	-67%	100%
Renew CBC Contract	3.501	3.501	0.000	0%	100%
Total	61.884	56.138	-5.746	-9.3%	88%

Table 7.42: 20c Investment in base/refresh

Draft Determination Assessment of 20d: Estate

7.412 NI Water is responsible for the upkeep of numerous structures which are classed as "Historic Estate". In addition, ongoing maintenance of operational

and administrative premises is essential. The investment included in the company's submission for this sub-programme and the outcome of our assessment for the draft determination is shown in the table below.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Historic Estate	2.660	2.481	-0.178	-6.7%	100%
Westland Campus	8.959	8.357	-0.600	-6.7%	73%
Silent Valley	0.821	0.766	-0.055	-6.7%	9%
Total	12.438	11.605	-0.833	-6.7%	75%

Table 7.43: 20d Investment in Estate

Final Determination Assessment of 20d: Estate

- 7.413 No further engagement took place after the draft determination. We revisited the information submitted in response to query 71 and decided that the value of the draft determination assessment should carry forward to the final determination.
- 7.414 The generic Reporter adjustment has been removed which results in the following final determination figures.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Historic Estate	2.660	2.660	0.000	0%	100%
Westland Campus	8.959	8.959	0.000	0%	73%
Silent Valley	0.821	0.821	0.000	0%	9%
Total	12.438	12.438	0.000	0%	75%

Table 7.44: 20d Investment in Estate

Draft Determination Assessment of 20e: Health & Safety

- 7.415 NI Water's Health and Safety (H&S) business case identified numerous areas where improvements were required to ensure compliance with statutory obligations.
- 7.416 The company calculated its budget for 'Facilities H&S Compliance' using a top-down analysis based on the area of floor space (m²). As part of query 97, we asked for the locations of proposed expenditure, however we did not receive a response to this particular part of the query
- 7.417 Our draft determination noted our concern that there may be an over-

estimation of the floor space requiring H&S expenditure, given the proposed investment on Westland campus buildings, the proposed movement of staff to Westland from other sites and the proposed construction of the new laboratories. We advised we intended to engage further with the company to establish a more accurate figure for the final determination.

- 7.418 For the purpose of the draft determination we allowed the requested amount less the generic Reporter adjustment. This resulted in a pre-efficiency allowance of £13.733m. We also concluded that Facilities H&S Compliance allowance should be 100% base.
- 7.419 The outcome of our assessments for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Facilities H&S Compliance	10.000	9.330	-0.670	-6.7%	100%
Other	4.719	4.403	-0.316	-6.7%	90%
Total	14.719	13.733	-0.986	-6.7%	100%



Final Determination Assessment of 20e: Health & Safety

- 7.420 Given that NI Water is still in the process of surveying its buildings, no further engagement took place and the value of the draft determination assessment was carried forward to the final determination.
- 7.421 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines. The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Facilities H&S Compliance	10.000	10.000	0.000	0%	100%
Other	4.719	4.719	0.000	0%	90%
Total	14.719	14.719	0.000	0%	100%

Table 7.46: 20e Investment in Health & Safety

Draft Determination Assessment of 20f: Planning for the Future

7.422 NI Water proposed a range of investment within this sub-programme to



deliver opex and capex efficiencies as well as delivering improvements in customer experience, environmental performance and building resilience.

Intelligent Operations Centre (IOC)

- 7.423 NI Water proposed to construct new offices at its Westland site in Belfast which is the main centre for operational staff. The company identified further investment to provide car-parking and improve the overall Westland site which is linked to this investment proposal.
- 7.424 The company argued that the investment would increase efficiency, although any savings are seen as a means of delivering catch-up efficiency as opposed to an additional saving.
- 7.425 Since the company developed its Business Plan, new ways of working have emerged in response to COVID19. Flexible and home working has increased. There is some indication that major office employers will embrace flexible working in the longer term which may reduce demand for office space and the cost of office leases. NI Water's existing plans would run counter to this potential direction of travel. In the draft determination we indicated that before reaching a decision on this project we expected NI Water to consider its approach in the light of new circumstances, including the potential for more home working and the potential for the costs of leased offices to reduce.
- 7.426 We allowed 70% of the requested amount (£9.169m) pending review of an updated business case.

Energy Efficiency

- 7.427 The energy efficiency project consisted of nine separate projects which NI Water wished to take forward during PC21. Seven of the projects had breakeven points between 4 and 10 years and 2 had no tangible financial benefits identified.
- 7.428 We disallowed funding for the following three projects that advocated early replacement of serviceable equipment:
 - Blower upgrades
 - Pumping station upgrades; and
 - Generator upgrades
- 7.429 Funding was disallowed because we were not clear that the NPC calculations supported the need for this investment. Furthermore, it was not clear if any associated impacts on other sub-programmes had been taken





into account.

7.430 We advised that we intended to engage further with the company on these issues prior to completing our final determination.

EV Charging

7.431 We disallowed the funding for EV Charging on the basis that we were deferring EV expenditure until the mid-term review. We advised that we would reconsider this funding when the strategy for electric vehicles was formalised.

Other

7.432 We removed 6.7% from all other projects in this sub-programme to reflect the generic Reporter adjustment.

Draft determination summary

7.433 The outcome of our assessments for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
IOC	13.098	9.169	-3.929	-30%	100%
Monitors & Sensors	4.201	3.920	-0.281	-6.7%	100%
Energy Efficiency	10.470	3.892	-6.578	-63%	0%
Groundwater Abstraction	2.401	2.240	-0.161	-6.7%	0%
PV	6.001	5.599	-0.402	-6.7%	0%
Wind	2.201	2.054	-0.147	-6.7%	0%
EV Charging	1.801	0.000	-1.801	-100%	0%
Battery Storage	6.001	5.599	-0.402	-6.7%	0%
Performance Excellence	0.600	0.599	-0.040	-6.7%	60%
Asset Delivery	1.851	1.727	-0.124	-6.7%	70%
RCM	1.901	1.774	-0.127	-6.7%	60%
Contact Management	1.051	0.980	-0.070	-6.7%	0%
IOC (Living With Water Programme)*	4.001	0.000	-4.001	-100%	70%
Total	55.578	37.512	-18.066	-33%	34%

Table 7.47: 20f Investment in Planning for the Future



Final Determination Assessment of 20f: Planning for the Future

Energy Efficiency

7.434 In its response to the draft determination NI Water provided updated business cases for blowers and pumping station upgrades. No new data was presented for generator upgrades. The company confirmed that the investment requested for energy efficiency was for enhancement expenditure over and above base maintenance requirement covered by the general base maintenance budget.

The new business case confirmed that replacement of blowers would occur at end of life. We therefore consider this to be base maintenance expenditure as we would expect NI Water to replace end-of-life equipment with the least whole life cost replacement. We have excluded this enhancement investment in the final determination as a result.

7.435 NI Water advised that the pumping station upgrade funding was for enhanced technology provision which was not necessarily linked to end of life replacement. It was however unable to produce a costed list of outputs for the pumping station upgrade project or robust justification for its predicted energy savings. Therefore, we were unable to quantify which parts of the proposed expenditure related to asset replacement, asset refurbishment or installation of new assets or properly assess the business case. Whilst we wish to support any initiative that delivers lower costs and a reduction in carbon emissions, this needs to be based on the provision of appropriate evidence and justification. As this has not been provided we have continued to disallow this funding in the final determination. However we are prepared to reconsider our position if NI Water presents an updated and robust business case to justify the investment during PC21.

EV Charging

7.436 For the final determination we decided to reinstate the costs for EV charging. This is because we recognise that NI Water will require some charging infrastructure in advance of purchasing Battery Electric Vehicles (BEVs). This follows on from our decision to increase funding on fleet replacement which will allow NI Water to purchase the requested number of BEVs in the second half of the price control period.

Other

7.437 NI Water provided no further information on the remaining projects in its draft determination response. The allowances therefore remain unchanged except

for the removal of the generic Reporter adjustment.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
IOC	13.098	9.169	-3.929	-30%	100%
Monitors & Sensors	4.201	4.201	0.000	0%	100%
Energy Efficiency	10.470	3.892	-6.578	-63%	0%
Groundwater Abstraction	2.401	2.401	0.000	0%	0%
PV	6.001	6.001	0.000	0%	0%
Wind	2.201	2.201	0.000	0%	0%
EV Charging	1.801	1.801	0.000	0%	0%
Battery Storage	6.001	6.001	0.000	0%	0%
Performance Excellence	0.600	0.600	0.000	0%	60%
Asset Delivery	1.851	1.851	0.000	0%	70%
RCM	1.901	1.901	0.000	0%	60%
Contact Management	1.051	1.051	0.000	0%	0%
IOC (Living With Water Programme)*	4.001	0.000	-4.001	-100%	70%
Total	55.578	41.069	-14.509	-26.1%	34%

Table 7.48: 20f Investment in Planning for the Future

Draft Determination Assessment of 20g – Other Essential Projects

- 7.438 NI Water described this sub-programme as "Other essential M&G projects that are required to address a number of customer, environment and business efficiency needs".
- 7.439 The investment included in the company's submission for this subprogramme and the outcome of our assessment for the draft determination is shown in the table below.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
AD - Asset Management Excellence - ISO55001 Improvements	0.501	0.468	-0.034	-6.7%	0%
AD - Asset Strategy - Wastewater Asset Performance Modelling	0.550	0.514	-0.037	-6.7%	100%
AD - Asset Strategy - Water Asset Performance Modelling	3.350	3.126	-0.224	-6.7%	100%
BIM and CDE (Common Data Environment) Project	0.501	0.468	-0.034	-6.7%	0%
Corporate Communication - Education programme	0.401	0.374	-0.027	-6.7%	50%
Innovation - Capital Efficiencies	0.661	0.617	-0.044	-6.7%	50%
Innovation - Future Innovation	0.661	0.617	-0.044	-6.7%	50%
Innovation - KPI Data	0.661	0.617	-0.044	-6.7%	50%
Innovation - Operational Efficiencies	0.235	0.220	-0.016	-6.7%	50%
Studies to Inform PC27 - Top 271 Priority Drainage Areas	7.770	7.249	-0.521	-6.7%	100%
Urban Drainage Modelling - Live Models for IOC	0.600	0.560	-0.040	-6.7%	0%
Water Fountains (Refill Stations)	0.216	0.202	-0.014	-6.7%	100%
Water Resource Demand Management Activities	0.460	0.430	-0.031	-6.7%	0%
Totals	16.569	15.459	-1.110	-6.7%	85%

Utility Regulator

Table 7.49: 20g Investment in other essential projects

7.440 All projects within this sub-programme were allowed subject to the generic Reporter adjustment of 6.7%.

Final Determination Assessment of 20g – Other Essential Projects

7.441 NI Water provided no further information on this sub-programme therefore, it remains unchanged except for the removal of the generic Reporter adjustment

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
AD - Asset Management Excellence - ISO55001 Improvements	0.501	0.501	0.000	0%	0%
AD - Asset Strategy - Wastewater Asset Performance Modelling	0.550	0.550	0.000	0%	100%
AD - Asset Strategy - Water Asset Performance Modelling	3.350	3.350	0.000	0%	100%
BIM and CDE (Common Data Environment) Project	0.501	0.501	0.000	0%	0%
Corporate Communication - Education programme	0.401	0.401	0.000	0%	50%
Innovation - Capital Efficiencies	0.661	0.661	0.000	0%	50%
Innovation - Future Innovation	0.661	0.661	0.000	0%	50%
Innovation - KPI Data	0.661	0.661	0.000	0%	50%
Innovation - Operational Efficiencies	0.235	0.235	0.000	0%	50%
Studies to Inform PC27 - Top 271 Priority Drainage Areas	7.770	7.770	0.000	0%	100%
Urban Drainage Modelling - Live Models for IOC	0.600	0.600	0.000	0%	0%
Water Fountains (Refill Stations)	0.216	0.216	0.000	0%	100%
Water Resource Demand Management Activities	0.460	0.460	0.000	0%	0%
Totals	16.569	16.569	0.000	0%	85%

Table 7.50: 20g Investment in other essential projects

Sub-programme 20 - Final Determination Summary

7.442 The outcome of our assessments for the final determination are summarised in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	DD Base Allocation
20a. PC15 Carryover	0.211	0.211	0.000	0.0%	24%
20b.Analytical Services Resilience	16.466	16.466	0.000	0.0%	35%
20c. ICT Base/Refresh	61.884	56.138	-5.746	-9.3%	70%
20d. Estate	12.438	12.438	0.000	0.0%	75%
20e. Health & Safety	14.719	14.719	0.000	0.0%	100%
20f. Planning for the Future	55.578	41.069	-14.509	-26.1%	34%
20g. Other Essential	16.569	16.569	0.000	0.0%	78%
Total	177.865	157.610	-20.255	-11.4%	72%

Table 7.51 – Final determination summary of sub-programme 20

Sub-programme 23 – Water mains new and renew

Background

- 7.443 The water mains new and renew sub programme covers water mains requisitions, public realm schemes and other programmes of work for the provision or repair of water mains outside the main programme of planned water main rehabilitation. It also covers the proposed programme of proactive lead pipe replacement.
- 7.444 The investment proposals submitted by the company for this sub-programme were broken down into five different project lines. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for Water mains new and renew

New water main requisitions

- 7.445 This programme of work covers the requisition of water mains to connect new developments to the existing distribution system. NI Water must service developments in response to demand which will ultimately determine actual costs.
- 7.446 For the purposes of its submission, the company estimated a cost of around £2m for this programme on the basis of historic run rates with an allowance for growth. In the absence of information on the extent of future requisitions,





the assessment of costs on the basis of historic demand is reasonable. However we did not find any robust justification for the company's allocation of 42% growth which appeared excessive. This compared to a growth rate of just under 5% in PC21 based on the company's submission for the total number of new connections.

- 7.447 In our draft determination we used the historic run rate of expenditure to project the water main requisition allowance for PC21, but reduced the growth uplift to align with the company's own estimate of the increase in the number of new connections. This resulted in a pre-efficiency allowance which was around 24% lower than the company's submission.
- 7.448 However we noted that NI Water was working to assess the impact that the actual connection numbers in the last 2 years of PC15 and COVID-19 might have on its projected connection numbers for PC21.
- 7.449 We therefore advised that we would continue to engage with the company with a view to establishing an agreed set of numbers for use in the final determination and would adjust the allowance for water main requisitions to reflect the outcome of this process when it had concluded.

Roads schemes including public realm and diversions

- 7.450 These programmes of work cover the cost of upgrade, repair and diversion of water mains as a consequence of work carried out by other bodies.
- 7.451 The roads schemes submitted by NI Water cover the repair and diversion of water mains in advance of road works by the Department for Infrastructure. Public realm work covers water main improvements in advance of the development of high quality paved areas by the Department of Communities, particularly pedestrian areas in urban centres. NI Water is notified of this type of development work in advance and is expected to carry out any necessary infrastructure improvements to avoid the disruption and cost of having to do so after the work being undertaken by the other bodies has been completed.
- 7.452 NI Water's submission indicated that it had based its assessment of the PC21 investment required for public realm work of around £4.8m on historic spend. However when an exercise to map historic expenditure to PC21 project lines within this sub-programme was undertaken, no public realm work was identified. During engagement with the company, it advised that any public realm work required in PC15 had been undertaken by the water main rehabilitation contractor under sub-programme 08 and 10. This meant that the historic costs had already been accounted for in our projected costs for other sub-programmes, so we did not allow any additional costs in sub-programme 23.



7.453 In our engagement with NI Water, it indicated that it had not been undertaking some public realm improvements in PC15 due to budget constraints and that some level of additional provision might therefore be appropriate. We advised that if the company could provide evidence to support this view we would consider it for the final determination.

Utility Regulator

- 7.454 NI Water submitted a table identifying nine roads schemes planned for PC21. This included estimated costs of just over £4m for the diversion work required for both water mains and sewers. We did not assess these schemes individually for the draft determination but applied the generic Reporter adjustment to get our pre-efficiency allowance. We advised we would consider whether it would be more appropriate to undertake individual assessments for the final determination.
- 7.455 In addition to the nine named roads schemes, NI Water included an additional £2m for 'future unknown schemes'. Our assessment of historic outturn costs indicated that actual costs are as likely to be lower than planned expenditure as they are to be higher. We therefore removed the £2m included in the programme for 'future unknown schemes' on this basis.
- 7.456 The company also included a small amount of carry over expenditure in this programme for the completion of work associated with the 'A6 Dungiven Drumahoe' road scheme which commenced in the second half of PC15. The figure of £0.175m submitted represented a small percentage of the overall expenditure on the project and was allowed in full.
- 7.457 The outcome of our assessment for roads and public realm work was a preefficiency allowance which was 64% lower than the company's submission.

Trunk main rehabilitation

- 7.458 NI Water proposed a specific programme of trunk main rehabilitation for the first time in PC15. This was included in recognition of the fact that certain trunk mains laid over the last 60 to 100 years would start to reach the end of their useful life. For PC15 the allocation was based on the investment required to deliver a rate of rehabilitation of 2.5 km per annum rising to 5km per annum. This cautious rate of intervention was adopted to allow time for the company to complete its assessment of the condition of mains. In PC15 we noted that we would expect the company to continue its investigations and be in a position to provide a more robust case for investment in the future.
- 7.459 For PC21 the company submitted specific proposals for the rehabilitation of six trunk mains which it ranks highest in terms of the risk of failure and the consequence of failure based on interruptions to supply. The proposed investment totalled just over £15m. For the draft determination we applied



the generic Reporter adjustment to these schemes to get our pre-efficiency allowance.

- 7.460 We noted that on initial inspection, the unit rates for these schemes appeared high when compared with information on historic unit rates submitted by NI Water in response to queries on other parts of the business plan submission. We advised we would investigate this further for the final determination and if necessary seek additional clarification on the extent of the submitted costs.
- 7.461 The company also included two general budget lines within this programme of work.
 - The first was for raw water trunk main rehabilitation at a pre-efficiency cost of around £1m. This is primarily to target work at raw water aqueducts and associated structures identified through investigations being carried out under a separate Water Asset Performance Modelling project. Initially the company used deterioration risk and reliability modelling to estimate the costs. However the outputs from this process were not used, as the company acknowledged that the statistical relationships to predict failure were too uncertain given the fact there is very little failure data to drive the models. The submission therefore simply represented a holding budget for potential work and has been categorised as a development output by NI Water due to the uncertainty over the exact requirements.
 - The second was a general pre-efficiency budget of around £2.8m for further trunk main rehabilitation work which has yet to been identified. The company allocated 40% of this budget to enhancement in its submission. We changed this to 7% to reflect the split of base and enhancement expenditure in the remainder of the sub-programme and the expected nature of this type work.
- 7.462 We recognise that further work may be required in both these areas as a result of ongoing investigations and assessments and so for the purposes of the draft determination we included both these sums subject to the generic Reporter adjustment. However we advised we would be seeking further evidence on how these budgets had been quantified prior to the final determination to establish whether they are fully justified.

Lead pipe replacement programme

7.463 The company's submission for proactive replacement of lead communication pipes is based on a continuation of the PC15 rate of 1,844 pipes per annum. This rate of replacement has been agreed by key stakeholders. The

company stated that its pre-efficient cost of £8.2m was based on average outturn costs in PC15. Our initial assessment however concluded that the unit rate and total cost submitted were significantly higher than estimates generated from the company's historic data. We queried this during the draft determination process and received additional information which indicated that costs had reduced significantly in the latter stages of PC15 following a retender of the relevant framework contract in 2018-19.

7.464 For the draft determination we applied the average unit rate for replacement since the establishment of this contract to the number of communication pipes being replaced in PC21 to determine an allowance. This resulted in a pre-efficiency figure which is around 38% lower than the company submission.

Water infrastructure at railways, roads and rivers

- 7.465 This programme covers work required to locate, inspect, survey and rehabilitate pipework that crosses, or is adjacent to, railways, road bridges and rivers. Because of the location of these assets, they are difficult to access for inspection and repair. The consequence of failure is high, as is the risk of the failure causing a major interruption to supply.
- 7.466 In PC15 NI Water concentrated on the inspection and rehabilitation of infrastructure in the vicinity of Northern Ireland Railway assets as these are most critical in terms of impact and cost. The majority of this work will have been completed in PC15 but there is some carry over into PC21. Once work in the vicinity of railways has been completed, the work programme will move on to road bridges and river crossings for the remainder of PC21.
- 7.467 NI Water's submission identified a significant level of investment that might be required to complete all investigations in the future. It however also acknowledged that infrastructure in the vicinity of roads and rivers poses a lesser risk than that at railways and so the company constrained the budget in recognition of other competing investment priorities in PC21. The submitted pre-efficiency budget of around £1.88m was intended to allow the remaining work at railway sites to be completed and also enable surveys to take place at the highest priority road bridge and river crossing sites.
- 7.468 Based on the activities and unit costs quoted in the company's business case, we concluded that the budget required to undertake this work was underestimated. We therefore increased the company's pre-efficiency allowance by around 15% accordingly. The generic Reporter adjustment was not applied as this allowance was estimated from historic costs.



Draft determination summary

7.469 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.

	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
New water main (requisitions)	2.044	1.549	-0.495	-24%	0%
Roads - including Public Realm and Diversions	10.972	3.941	-7.031	-64%	62%
Trunk main rehabilitation	19.219	17.931	-1.288	-6.7%	93%
Proactive Lead pipe replacement	8.240	5.109	-3.13	-38%	0%
Water main Infra – Railways, Roads and Rivers	1.880	2.158	0.278	15%	100%
Total	42.354	30.687	-11.666	-28%	69%

Table 7.52: Investment in water mains new and renew.

Final determination assessment for Water mains new and renew

New water main requisitions

- 7.470 In the draft determination, we noted that we planned to adjust the water main requisition allowance in the final determination to reflect revised projections of PC21 connection numbers following further consideration of the impact of COVID-19 and PC15 outturn data by NI Water. The company's response to the draft determination indicated that it agreed with the proposed approach.
- 7.471 The outcome was a slightly lower allowance for water main requisitions in the final determination due to the estimated number of connections for PC21 reducing from 44,400 in the business plan submission to a revised estimate of 42,678.

Roads schemes including public realm and diversions

7.472 We considered whether there would be merit undertaking individual assessments for the nine named road diversion schemes for the final determination, but concluded that the submitted information was sufficient. We therefore didn't make any further adjustment to the submitted baseline costs for these new schemes. However we allowed additional carry over expenditure for the completion of work on the 'A6 Dungiven Drumahoe' road



scheme, based on an updated PC15 outturn report submitted by the company. The 'A6 Dungiven Drumahoe' allowance increased from £175k to £431k as a result and the PC15 logging down figure was adjusted accordingly.

Utility Regulator

- 7.473 In the draft determination we had indicated that if the company could provide evidence that public realm work in PC21 would require a higher allowance than actual costs in PC15, we would consider it for the final determination.
- 7.474 In its draft determination response the company advised that the projected outturn costs for 'water' public realm work in PC15 was just under £0.6m and confirmed that these costs were embedded in the historic costs data for other sub-programmes (i.e. water main rehabilitation and operations capital). Our determination will therefore already include for an equivalent level of expenditure in PC21 as the budgets for these two sub-programmes have been projected on the basis of historic costs.
- 7.475 In its draft determination response the company revised its request for public realm work under this sub-programme from £4.8m to £0.2m. It indicated that this was based on a high level estimate for work that could be required on services/stop-cocks within the footprint of certain major public realm schemes that might proceed in Belfast.
- 7.476 These schemes primarily impact the allowance for the sewerage new and renew sub-programme (i.e.SP24), where the company has requested £4.8m over and above historic costs. Our assessment of the likelihood of these schemes proceeding and what would represent an appropriate additional allowance is therefore dealt with in detail in our commentary for that sub-programme.
- 7.477 For the water new and renew sub-programme we have applied a pro-rata adjustment to the figure requested, based on the outcome of our assessment for sub-programme 24. This reflects the fact that the amount of public realm work required under each of these sub-programmes should be proportional.
- 7.478 This pro rata adjustment results in a final determination allowance of £0.112. This compares to £4.8m in the original submission and a revised request of £0.2m in the draft determination response. We estimate that this equates to a total PC21 allocation of around £0.7m for 'water' public realm work, when the allowances embedded in the water main rehabilitation and operations capital sub-programmes are taken into account.

Trunk main rehabilitation

7.479 In our draft determination we indicated that we would consider the costs submitted for individual trunk main schemes further for the final



determination. Our conclusion is that the submitted costs are not unreasonable. We have therefore not made any further adjustments to the baseline costs submitted for these schemes in the final determination.

Utility Regulator

- 7.480 The cost submitted by the company for the rehabilitation of raw water trunk mains and aqueducts has not been adjusted either. NI Water has around 250km of these older, large diameter assets which are critical to the provision of drinking water to customers. We recognise that the allocation of a budget for work identified by investigations completed under the Water Asset Performance Modelling project is needed and the relatively low budget requested is not considered unreasonable. We note that NI Water has identified this as a development output due to the need to confirm the exact extent of the investment requirements through its ongoing investigations. We will ask NI Water to provide updates as this work progresses as detailed in Annex T of our final determination.
- 7.481 In response to the draft determination, NI Water provided further information relating to its request for a 'holding' budget for rehabilitation work on distribution trunk mains that has not yet been fully identified or costed.
- 7.482 It confirmed the submitted budget of £2.8m simply equated to 15% of the trunk main budget allocation. It also submitted costs totalling £1.3m for three schemes which had been priced since the business plan submission.
- 7.483 In response to further queries it identified three further schemes that it anticipated having to deliver which were as yet unpriced. It also provided information which showed that it's overspend in PC15 against allocated budget was £1.45m.
- 7.484 When we applied the 15% that the company had advised was used to estimate the holding line budget to the costed programme, we found that it generated a figure of £2.265m rather than the figure of £2.8m submitted by NI Water. We have therefore adjusted the allowance accordingly in our final determination.
- 7.485 This represents an uplift of around 75% on the cost of the 3 schemes that the company has priced to date and an uplift of just under 60% on the PC15 overspend. We therefore consider the allocation to be reasonable based on this, combined with the fact that the costed elements of the programme for PC21 are better defined and have increased in value compared to PC15.

Lead pipe replacement programme

7.486 For the final determination we reconsidered our approach to estimating the unit cost used for establishing the allowance for proactive lead communication pipe replacement in PC21.



7.487 We adopted an approach which is consistent with that used for other programme lines in the determination. We therefore based our assessment on the average unit cost in the first 5 years of PC15.

Utility Regulator

7.488 Whilst this approach results in a higher allowance than in the draft determination, it recognises the fact that many cost changes will have occurred since the submission and that over the programme as a whole these might be expected to balance each other out. It avoids the need to identify every variation and the potential weakness associated with considering specific changes in isolation.

Water infrastructure at railways, roads and rivers

7.489 Our assessment of this element of the sub-programme remains unchanged.

Final determination summary

- 7.490 In line with the revised approach explained in Section 5, we have also removed the generic Reporter adjustment from all programme lines.
- 7.491 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.

	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
New water main (requisitions)	2.044	1.489	-0.555	-27%	0%
Roads - including Public Realm and Diversions	10.972	4.579	-6.393	-58%	62%
Trunk main rehabilitation	19.219	18.656	-0.563	-3%	93%
Proactive Lead pipe replacement	8.240	6.686	-1.553	-19%	0%
Water main Infra – Railways, Roads and Rivers	1.880	2.158	0.278	15%	100%
Total	42.354	33.567	-8.787	-21%	67%

 Table 7.53: Investment in water mains new and renew.

Sub-programme 24 – New and renew sewerage

Background

7.492 The sub-programme of new and renew sewerage covers sewer requisitions, public realm schemes and other programmes of work for the provision or repair of sewers outside the main programme of planned sewer



rehabilitation.

7.493 The investment proposals submitted by the company for this sub-programme has been summarised into four different investment areas. The outcome of our draft and final determination assessments for each element is set out below. This includes an explanation of how we arrived at our decisions at each stage of the process.

Draft determination assessment for sewerage new and renew

Sewerage - First time services and sewers for adoption

- 7.494 The company's submission indicated that this programme of work covered the requisitioning of sewers to connect new developments to the existing sewerage network and for minor works required to facilitate the adoption of development sites into the public wastewater network.
- 7.495 However during the draft determination process NI Water clarified that it had included sewers for adoption under sub-programme 24 in error and that these costs should have formed part of the Ops Capital Sewerage submission (sub-programme 18) as this is where it accounts for these costs. We adjusted our draft determination accordingly and so our assessment of costs for sub-programme 24 only covered sewer requisitions.
- 7.496 The company indicated it had estimated the PC21 budget requirement of £25.27m for first time services on a pro rata uplift of outturn expenditure in the first 4 years of PC15, with a 1% cumulative allowance for growth.
- 7.497 In the absence of information on the extent of future requisitions, adopting this approach to the assessment of costs is reasonable. However when we checked the company's submission it showed that the company expected the number of sewer connections to reduce by around 6% in PC21, rather than increase. The growth assumption stated for this programme of work therefore did not appear reasonable.
- 7.498 For the draft determination, we obtained an updated projection of PC15 outturn expenditure from the company and reduced this in proportion to the anticipated reduction in connection numbers in PC21. This resulted in a pre-efficiency allowance for first time services which was around 6% lower than the company submitted.
- 7.499 The overall programme line was 11% lower because the sewer for adoption element of £1.413m had been removed and assessed as part of sub-programme 18 (Ops Capital Sewerage) as requested by the company.





Sewerage – Culmore drainage area development objective

- 7.500 NI Water included a pre-efficiency budget of around £8.8m for work required to address capacity issues in a trunk sewer which is restricting development. The investment proposed would deliver two wastewater pumping stations and just under 9km of large diameter pumping main. NI Water acknowledged that the cost estimates for this work are very uncertain as they are based on a study completed in 2011. As a result they have categorised this as a development output and plan to complete a new drainage area plan, including hydraulic modelling, to confirm the exact requirements for this scheme. This plan is ranked number one on the priority list that the company has agreed with NIEA.
- 7.501 For the purposes of the draft determination we included this investment and applied the generic Reporter adjustment to get our pre-efficiency allowance. We also noted that the company should not proceed with any investment until it has completed its drainage area study, fully developed its solutions and submitted final proposals to us for separate determination. We advised that we would seek an update from the company on its programme for completing this work prior to completing our final determination.

Roads schemes including public realm

- 7.502 For PC15 this programme covered the costs of repair and diversion of sewers in advance of public realm and roads schemes carried out by other bodies.
- 7.503 The company included the cost of sewerage work required in advance of roads works in sub-programme 23 as this will be carried out alongside equivalent work on water mains. As a result the only submission made under this sub-programme for PC21 was for public realm work. This covers sewer improvements in advance of the development of high quality paved areas, particularly pedestrian areas in urban centres.
- 7.504 NI Water's submission indicated that it had based its assessment of the PC21 investment required for public realm work of around £4.8m on historic spend. However, as with SP23, when an exercise to map historic expenditure to PC21 project lines was undertaken, no public realm work was identified. The assumption was that any relevant expenditure in PC15 would have been undertaken by the sewer main rehabilitation contractor under sub-programme 12. This meant that any historic costs had already been accounted for elsewhere in our assessment and so we did not include an allowance for public realm work within sub-programme 24.
- 7.505 In our engagement with the company, it indicated that it had not been



undertaking some public realm improvements in PC15 due to budget constraints and that some level of additional provision might therefore be appropriate. We advised that if the company could provide evidence to support this view we would consider it for the final determination.

Utility Regulator

Sewerage infrastructure at railways, roads and rivers

- 7.506 This programme covers the work required to locate, inspect/survey and undertake rehabilitation of pipework crossing or adjacent to railways, road bridges and rivers. Because of their location, these assets are difficult to access for inspection and repair. The consequence of failure is high, as is the risk of pipe failure causing a major pollution incident.
- 7.507 The submitted pre-efficiency budget of around £1.15m was to allow NI Water to undertake priority work on gravity sewers and wastewater pumping mains. In our commentary for sub-programme 23, we noted that the company had identified a significant level of investment that might be required to complete all water main and sewer investigations moving forward, but that it had constrained the budget for road and river work in PC21 in recognition of other competing investment priorities.
- 7.508 The budget allocated for sub-programme 24 did not appear to have been estimated from activity levels, but instead appeared to be the balance of the overall constrained budget following deduction of the water main element. Our assessment showed that the constrained budget for both water mains and sewers of just over £3m compared to anticipated expenditure of around £6m in PC15. For the draft determination we followed the same approach as the company and allowed the balance of the constrained budget following deduction of the water main element. This resulted in a pre-efficiency allowance which was 24% lower than the company's submission due to the fact that a higher figure was estimated for sub-programme 23 based on stated activity rates. However the overall pre-efficiency allocation across both sub-programmes for railway, road and river infrastructure work remained the same as in the company's submission. The Reporter's generic adjustment was not applied as this budget is already constrained.

Draft determination summary

7.509 The outcome of our assessments for each element of the sub-programme for the draft determination resulted in the following pre-efficiency allowances.



	BP Pre- efficiency	DD Pre- efficiency	Variance to BP	% change	DD Base Allocation
Sewerage - FTS and sewers for adoption	26.683	23.635	-3.049	-11%	0%
Sewerage – Culmore DA development objective	8.775	8.187	-0.588	-6.7%	0%
Roads - Public realm	4.808	0.000	-4.808	-100%	N/A
Sewerage Infra – Railways, Roads and Rivers	1.151	0.873	-0.278	-24%	100%
Total	41.417	32.695	-8.722	-21%	3%

Table 7.54: Investment in new and renew sewerage.

Final determination assessment for sewerage new and renew

Sewerage - First time services

- 7.510 For the final determination we adjusted the first time services allowance to reflect revised projections of PC21 connection numbers, following consideration of the impact of COVID-19 and PC15 outturn data by NI Water.
- 7.511 This resulted in a slightly lower allowance in the final determination due to the estimated number of connections for PC21 reducing from 33,300 in the business plan submission to a revised estimate of 32,160.

Sewerage – Culmore drainage area development objective

- 7.512 For the final determination we requested additional information on the Culmore sewerage scheme.
- 7.513 We established that the submitted costs reflected the costs for one of three potential solutions. The cost of one of the other schemes would be significantly higher and the cost of the other would be significantly lower. There is currently no certainty over which, if any, is the most likely solution.
- 7.514 We also asked the company to show how the submitted figure related to costs identified in a needs and options report provided as supporting evidence as part of its original business plan. The costs in this needs and options report were much lower than those submitted in the business plan, even after being uplifted to 2018-19 prices. The company did not respond to this request.
- 7.515 Due to the uncertainty over the final solution and associated costs and the fact that the supporting needs and options report included a much lower



value, we have decided that it is not appropriate to include a scope risk of £1.243m. We have therefore adjusted the final determination allowance accordingly.

7.516 We note that NI Water has identified this as a development output due to the need to confirm the solution and investment requirements through the completion of another drainage area study. We will ask NI Water to provide us with updates as this work progresses, as detailed in Annex T of our final determination.

Roads schemes including public realm

- 7.517 In the draft determination we had indicated that if the company could provide evidence that public realm work in PC21 would require a higher allowance than actual costs in PC15, we would consider it for the final determination.
- 7.518 In its draft determination response, the company advised that the projected outturn costs for 'wastewater' public realm work in PC15 was around £2.5m and confirmed that these costs were embedded in the historic costs data for sub-programme 12 (i.e. sewerage). Our determination will therefore already include for an equivalent level of expenditure in PC21 as a result of our cost assessment and allocation for sub-programme 12.
- 7.519 In its draft determination response the company maintained that its request for an additional £4.8m under this sub-programme was appropriate because it had been unable to complete all planned work in PC15 due to budget constraints. It also advised that it expected four large public realm schemes to proceed in Belfast in PC21. It quoted expenditure requirements for the most advanced of these schemes as £3m.
- 7.520 We queried the deferral of expenditure in PC15 and NI Water provided evidence that £0.5m of planned work had not been undertaken. When completed work is accounted for (£0.6m water and £2.5m sewerage) this indicates an expenditure requirement of £3.6m in PC15 against a budget allocation of £6m (£3m water and £3m sewerage).
- 7.521 We also asked NI Water to provide copies of Department for Community (DfC) progress reports, relating to the delivery of the 4 large public realm schemes in Belfast that had been referred to. These progress reports date back to 2016 and show that there has been significant slippage in planned delivery. Over a period of 4 years the estimated delivery date for the most advanced scheme has slipped by 5 years. This may be because DfC also needs to be able to secure significant amounts of funding to deliver these schemes. Indeed, this funding dependency is noted in the reports. On the basis of the information provided we do not share the company's confidence that 'there is a high likelihood these schemes will advance in PC21'.



7.522 We asked for a breakdown of the £3m cost quoted for the most advanced major public realm scheme. This was provided, but when we adjusted for an element of work already undertaken and aligned the risk allocation to that applied to the sewerage sub-programme (i.e. sub-programme 12) we estimated a lower requirement of £2.695m.

Utility Regulator

- 7.523 We have included this figure as an additional allowance in the final determination. This is over and above the equivalent historic costs for public realm work which have been allowed for in other sub-programmes. This additional allowance has been included because of the scale of the costs associated with this scheme and because it is the most advanced from a planning perspective. It therefore has the greatest chance of proceeding in PC21. We have not allowed any further funding because we have little confidence that any of the other major schemes will proceed based on the information received.
- 7.524 As indicated previously, we reduced the additional allowance requested in sub-programme 23 in proportion to the adjustment made in this sub-programme. This is because the allowance for 'water' would be equally impacted by our conclusions on the amount of additional public realm work that might need to be undertaken in PC21.
- 7.525 When the public realm allocation in sub-programmes 23 and 24 (i.e. £0.112m and £2.695m) is added to the allocations which we consider to be embedded within the allowances for sub-programmes 08, 10 and 12 (i.e. £3.106m), this equates to an overall allowance of £5.91m for PC21. This compares to a budget allocation of £6m in PC15 and actual expenditure of £3.1m. Even if the £0.5m of deferred expenditure quoted by the company is taken into account the PC15 requirement would only have been £3.6m. We consider the allocation to be reasonable on the basis of this and the fact that even the most advanced major public realm scheme might not go ahead.

Sewerage infrastructure at railways, roads and rivers

7.526 Our assessment of this element of the sub-programme remains unchanged.

Final determination summary

- 7.527 In line with the revised approach explained in Section 5, we have removed the generic Reporter adjustment from all programme lines.
- 7.528 The final determination pre-efficiency allowances resulting from the adjustments described above are detailed in the table below.



	BP Pre- efficiency	FD Pre- efficiency	Variance to BP	% change	FD Base Allocation
Sewerage - FTS and sewers for adoption	26.683	22.825	-3.858	-14%	0%
Sewerage – Culmore DA development objective	8.775	7.533	-1.243	-14.2%	0%
Roads - Public realm	4.808	2.695	-2.113	-44%	80%
Sewerage Infra – Railways, Roads and Rivers	1.151	0.873	-0.278	-24%	100%
Total	41.417	33.926	-7.491	-18%	9%

 Table 7.55: Investment in new and renew sewerage.

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8. Other Adjustments for the Final Determination

- 8.1 The final determination includes three further adjustments to the investment programme to take account of changes from the business plan submission.
 - a) Additional PC15 carry-over.
 - b) PC21 Early start projects.
 - c) Specific Reporter adjustments.

Additional PC15 carry-over.

- 8.2 NI Water provided an updated submission of PC15 Out-turn and PC21 carry over in April 2021. This identified additional investment in PC21 from PC15 carry over projects not included in the business plan submission totalling £46.4m. These schemes included:
 - a) additional outputs.
 - b) increased carry over including base maintenance projects; and,
 - c) projects which are the development of PC21 projects already identified in the company's business plan submission.
- 8.3 Following further engagement with the company we allowed additional carryover projects which:
 - a) included additional carry-over enhancement budget from PC15, logging down the equivalent amount in the PC15 out-turn report, or
 - b) delivered additional and necessary outputs.
- 8.4 We did not include projects which are the out-working of PC21 projects already included in the business plan submission. Nor did we include carryover projects which were base maintenance only, as these should be funded from the top down econometric allowances included in the final determination.
- 8.5 A total of £27.3m pre-efficiency was included in the final determination for additional PC21 carryover projects. Because these projects are already committed, no further efficiency was applied.

PC21 Early start projects

8.6 NI Water's updated submission for PC15 Out-turn and PC21 carry over in

April 2021 included investment identified as PC21 Early start projects. That is, investment in the last year of PC15 which formed part of the investment for the PC21 period in the company's business plan submission. The enhancement element of this investment was logged up as an additional output in the PC15 Out-turn report.

Utility Regulator

8.7 While the additional investment was identified for PC21, the company did not modify its original PC21 estimates to deduct the cost of work already completed in PC15. For the final determination, we have adjusted the enhancement element of the PC21 investment plan by deducting £8.7m post efficiency to account for this early start investment.

Specific Reporter adjustments

- 8.8 Following a review of NI Water costing systems, the Reporter identified two adjustments to the pre-efficiency allocation relating to Scope Risk:
 - a) An addition of £4.5m to sub-programme 12 (sewerage); and
 - b) A deduction of 13.5m from sub-programme 16 (wastewater treatment works).
- 8.9 We applied these as a bottom line adjustment to the relevant subprogrammes. We assumed that 18% of the adjustment related to base maintenance. We profiled the expenditure in line with the sub-programme profiles and applied an efficiency adjustment relevant to the subprogrammes. This resulted in a net deduction of £7.8m post efficiency.