


# Water and Sewerage Service Price Control 2013-15

PC13 Annex K  
PC13 Outputs

September 2012



# Water and Sewerage Revenue and Charges Price Control 2010-2013

PC13 Draft Determination

Annex K – PC13 Outputs

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# 1 Introduction

1.1.1 In this introduction we provide an overview of the outputs for PC13 with more detailed information provided in the following sections:

Section 2 – Consumer service outputs

Section 3 – Water service outputs

Section 4 – Sewerage service outputs

Section 5 – Management and general investment

1.1.2 We also comment on the development of outputs for PC15.

1.1.3 The objective of investing in water and sewerage services is to maintain and improve the service delivered to consumers. Ultimately consumers experience service as a series of outcomes. For example:

- Whether tap water is safe to drink; is acceptable in taste, odour and appearance; and, the supply is reliable both in regular operation and in extreme conditions.
- Whether surface and foul wastewater is drained effectively and consumers are not affected directly by flooding or have a reasonable fear that they might be affected by flooding from sewers.
- Whether the impact of water and sewerage services on the environment is limited including the impact of water abstraction and the pollution which can be caused by intermittent and continuous discharges of wastewater.
- Whether the company responds quickly when things go wrong and is able to resolve the underlying problem satisfactorily and keeps the consumer informed while doing so.

1.1.4 In practice, a water and sewerage company will deliver a series of outputs which aim to secure the outcomes consumers want. We have assessed the outputs for PC13 in line with the level of investment. These outputs form part of an overall package which the company must consider.

1.1.5 We categorise outputs under three headings:

- **Service level outputs:** service level outputs measure the impact of investment on the level of service experienced by consumers. For example the number and duration of interruptions to supply or the overall compliance with water quality parameters. This type of output is preferred as it maximises the freedom of the company to determine the best way to deliver the required level of service at minimum cost. It encourages innovation and cost savings which benefit consumers in the longer term.
- **Nominated outputs:** these are specific items, often those identified by quality regulators such as the improvement to a discharge standard to meet

mandatory legislative requirements. We have also included a number of specific improvements identified by the company in its plan as nominated outputs such as trunk main schemes or the provision of additional water storage capacity or major base maintenance upgrades to wastewater treatment works.

- **General activities:** we have included activities (such as the rate of replacement of water mains or the replacement of sewerage) as outputs where it was not possible to establish a clear link between activity and service level outputs in the short term. This ensures that the company will put forward robust plans for each Price Control period against which it can be monitored. Activity rates can be reviewed at subsequent Business Plans and increased or reduced to reflect experience and future levels of service required by consumers.

1.1.6 In addition to monitoring individual outputs we also assess the company's progress against a composite Overall Performance Assessment which combines a range of service measures. Further detailed information on the OPA is included in Annex E.

1.1.7 Under the three categories outlined above, the scope of outputs included in the draft determination are:

## Service level outputs

1.1.8 Service level outputs can be grouped in broad categories which cover:

- **Direct service to consumers measures.** These include: pressure of water supplied, frequency of interruption to water supply and the risk of sewer flooding. An overall performance target is set to reduce interruptions to supply. We continue to set activity targets to reduce the number of properties subject to low pressure and at risk of flooding.
- **Consumer contact measures.** For PC13, we agreed to continue to use a basket of consumer contact measures used in the SBP and PC10. These cover: the speed of response to billing contacts, consumer complaints, and telephone calls; whether metered bills are based on readings; and overall call handling satisfaction.
- **Water quality compliance.** Three targets are set for water quality based on the regulatory sampling and testing programme for the DWI. The targets cover overall compliance (MZC), a quality compliance measure related to distribution mains (OPI[TIM]) and a measure of water quality at local service reservoirs.
- **Wastewater quality compliance.** We have reduced the number of targets for wastewater quality against numeric consents to two and introduced a target for small wastewater treatment works compliance for the first time. A further service level output covers high and medium pollution incidents.

- **Water resource.** We include targets for leakage and a 'security of supply index' which is a measure of the deficit between supply and demand.

1.1.9 For some service level outputs, the company is able to link future performance to the level of investment or changes in operational practice. But this is not the case for some key outputs. In particular:

- NI Water's consumers experience a higher level of interruptions to supply than those in England, Wales and Scotland. It is likely that the greater length of main per property contributes to this. The company has plans to achieve a further reduction in interruptions to supply in PC13, but has not provided any information linking the cause of interruptions to supply to potential solutions based on investment or changes in operational practice which would allow us to determine whether the proposed target is reasonable.
- The rate of medium and high pollution incidents in Northern Ireland is significantly higher than in England and Wales. The company has commented that water and sewerage companies in England and Wales have benefitted from higher levels of investment in their sewerage systems in recent years which has allowed them to reduce the frequency of pollution incidents. The company has proposed a modest reduction during PC13 but has not provided us with any information linking the cause of pollution incidents to potential solutions based on investment or changes in operational practice which would allow us to determine whether the proposed target is reasonable.
- The company has developed its flooding register to identify properties which are at risk of flooding. It has proposed a programme of work to alleviate property flooding based on a number of properties and a unit cost per property. However, the company has not completed the additional investigations including hydraulic analysis required to confirm the risk and extent of flooding and the cost and prioritisation of solutions.

1.1.10 In these three areas we expect the company to provide further information for the final determination or set out a clear programme of work which will allow it to set out challenging and realistic targets in its PC15 Business Plan which are linked to investment and improvements in operational practice.

### **Nominated outputs**

1.1.11 Individual nominated outputs have been identified for:

- Construction of 4 water trunk mains to secure water supply.
- Complete four major incident mitigation projects aimed at improving resilience within the distribution system.
- Upgrades to two water treatment works to secure water quality compliance.

- Expansion of the capacity of one service reservoir to secure water supply.
- Improvements to 34 wastewater treatment works to comply with new and existing consents.
- Improvements to 96 unsatisfactory intermittent discharges from the sewerage system to improve receiving water quality and reduce pollution.

1.1.12 NI Water provided lists of individual schemes and outline Business Cases providing a robust link between investment and outputs. We have provided the company with feedback on these nominated outputs and asked that some remaining issues be clarified for the final determination.

### **General activities**

1.1.13 General activities have been identified for:

- Water mains rehabilitation as part of a planned programme of work.
- Sewers replaced or relined.
- Number of small water treatment works upgrades to be prioritised by NIEA and NI Water.

1.1.14 The company has been able to provide information linking the level of activity to investment based on current unit costs.

1.1.15 The company has proposed an increase in the unit cost of water mains rehabilitation to reflect a shift in work from rural to urban areas. We will monitor the level of delivery in rural and urban areas to confirm that the company delivers the activity proposed in its Business Plan.

## **2 Consumer Outputs**

2.1.1 For PC13 we have agreed to continue to use the basket of consumer contact measures used in the SBP period and PC10. These cover: the speed of response to billing contacts, consumer complaints, and telephone calls; whether metered bills are based on readings; and overall call handling satisfaction.

2.1.2 NI Water performance for the majority of these measures is already high and comparable to the average performance in England and Wales in recent years. The company plans to deliver some further improvements by the end of PC13 which will move the performance of the basket as a whole closer to the England

and Wales average. The proposed targets for PC13 have been accepted on this basis.

- 2.1.3 For PC15 we will work with CCNI, the company and other stakeholders to consider whether other consumer response measures should be introduced to help NI Water focus improvements on the issues that are most important to consumers.

## 3 Water Service Outputs

### 3.1 Properties at risk of low pressure (DG2)

- 3.1.1 Over the course of the SBP period and PC10, NI Water has developed and validated a register of properties which are at risk of low pressure. At the end of the PC10 period it is estimated that this will contain around 1500 properties.
- 3.1.2 NI Water plans to remove a further 288 properties from this register by company action during PC13. The company has provided information which links the proposed annual reductions directly to planned watermain rehabilitation work packages and the projections have been accepted on this basis.
- 3.1.3 The percentage of properties that are at risk of low pressure at the end of PC13 will however still be much higher than the average performance in England Wales over the past ten to fifteen years.
- 3.1.4 Low pressure is an issue which has an ongoing impact on the consumers affected. NI Water undertakes work to improve supply pressure as part of its planned programme of mains rehabilitation which prioritises work on the basis of a range of issues – including burst frequency and water quality. For PC15, NI Water should include an assessment of the work needed to provide water at target pressure to all properties.

### 3.2 Properties experiencing interruptions to supply (DG3)

- 3.2.1 Our final determination for PC10 noted that the link between DG3 improvements and investment was weak and stated that we expected the company to improve its understanding of interruptions to supply in order to develop a more robust plan for PC13. The company is working to improve its methodology for targeting investment in water mains which should include improve the link between

investment and DG3 improvements. However, it has not completed this work yet. The company should complete the work necessary to link investment and DG3 improvements in time to complete its PC15 Business Plan.

- 3.2.2 Our PC10 determination also noted the potential impact that NI Water's relatively high length of mains per property was having on performance in this area. We expect the company to consider the interaction between length of main per property, burst rate and interruptions when developing proposals for PC15.

### 3.3 Leakage

- 3.3.1 During PC10, the company has improved the quality of information and the methodology used to estimate leakage. These improvements have affected the level of leakage reported and this must be taken into account when assessing performance over the period on a like for like basis. They do not change the amount of leakage but simply provide a better estimate of what is already there. In particular:

- In 2010-11 the company improved the 'hour-day' factor used to convert leakage measured at night-time, when pressures are high, to a daily leakage figure. This increased reported leakage by 2 Mld and we adjusted the PC10 targets by the same amount.
- In 2011-12 the company completed data improvement work on property numbers. Introducing this data into the current leakage management software caused the reported level of leakage to increase by 9Mld.

- 3.3.2 The PC10 leakage targets and reported leakage from 2008-09 to 2011-12 are shown on Figure 1. We have also shown leakage on a like-for-like basis against the PC10 targets, taking account of the changes described above.

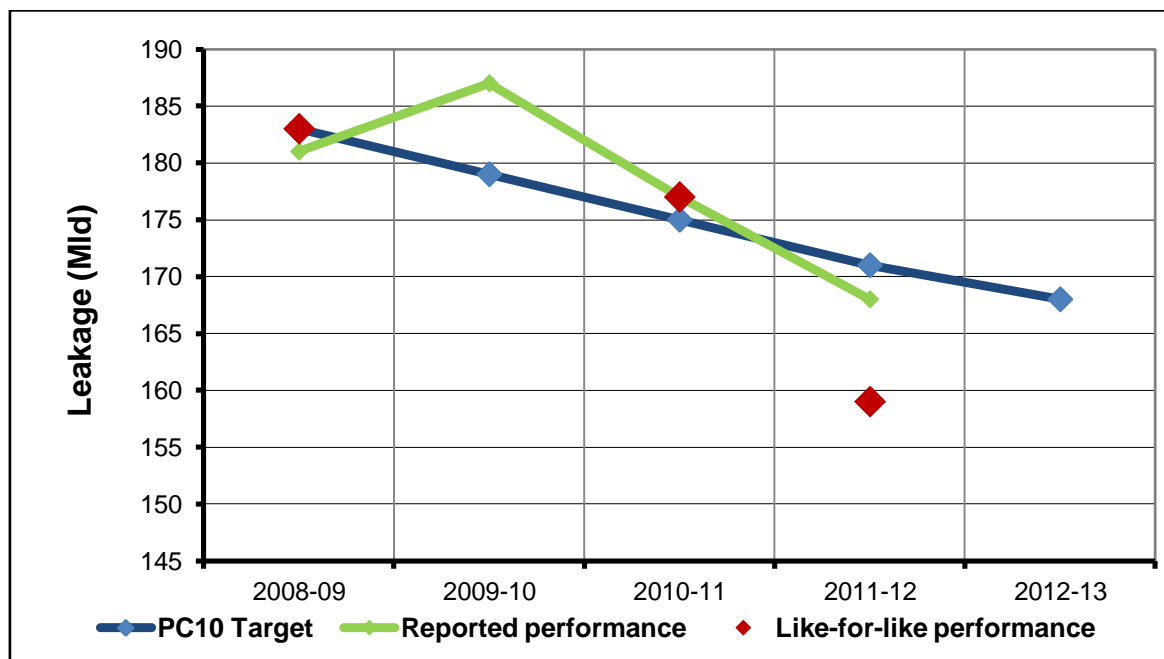
- 3.3.3 We recognise that the intervening years have not been typical:

- A freeze thaw event occurred in the winter of 2009-10. This affected the west of the province most severely and was estimated to be a 30 year event. No adjustment was made to the reported level of leakage in this year to account for losses on consumer premises.
- This was followed by a freeze thaw event in the winter of 2010-11 which affected the whole of Northern Ireland and was a greater than 100 year event. Measured leakage for this year was adjusted to exclude bursts and other water losses on consumer premises.



3.3.4 Taking a medium term view on a like for like basis, we estimate that the company reduced leakage by 24 Mld between 2008-09 and 2011-12, an average of 8 Mld per annum.

**Figure 1 - Leakage performance over PC10**



- 3.3.5 In 2013-14 the company will introduce new leakage management software which will improve the quality of information management and analysis, and assist it in targeting leakage reduction. The new software uses a different methodology to determine the minimum night flows which underpin leakage estimates. The company is currently using the new software in parallel with its existing leakage management system to ensure that it is populated with quality controlled data and can be used with confidence before the existing system is switched off. This work suggests that the new system will report a slightly higher level of leakage than the current system. That is not to say that the amount of leakage has increased, only that a revised methodology capable of investigating leakage in more detail results in a better estimate. The company has kept us informed of these changes and we continue to have confidence in the work being undertaken to improve leakage management. We have asked the company to update us on the likely change to the reported level of leakage in October which will allow us to set targets for PC13.
- 3.3.6 Until this work is complete we cannot define an absolute leakage target for PC13. For the draft determination we have included a level of capital funding for leakage reduction which is consistent with that included in PC10. Since 2008-09, we

estimate that the company has delivered an average level of leakage reduction of 8Mld per annum measured on a like for like basis. However we accept that reductions may become more difficult to deliver as leakage reduces. Therefore our target for leakage reduction in PC13 is 5 Mld per annum. The starting point for the reductions will be the company's best estimate of the outcome for 2012-13 to be determined in October 2012 using its new leakage software.

3.3.7 In addition to Leakage reduction, the determination also allows funding for the company to:

- Update its assessment of the sustainable economic level of leakage by January 2014 to provide the basis for leakage targets in PC15. This new sustainable level of leakage assessment should take account of any further changes in methodology or key assumptions which the company has identified during PC13.
- Continue to optimise DMAs and undertake further studies of trunk-mains and DMAs.
- Maintain existing pressure reduction valves and continue to install pressure management to help reduce leakage.
- Maintain and improve meters thus improving flow data collection.

3.3.8 Whilst we welcome the improvements to leakage management made by the company over PC10, we are conscious that these changes make it difficult to assess the improvements delivered against targets on a like for like basis. We understand that the introduction of new leakage software is the final major planned change to the company's leakage management systems. The company has also been working to assure the quality of data as it is deployed in the new system. Therefore, we expect the company to report leakage through PC13 using the same methodology and key assumptions that will be used to determine leakage targets. The movement in reported leakage over the period will then reflect real improvements. If the company identifies any further changes to methodology or assumptions these should not be implemented until PC15, unless the company can demonstrate, and the Utility Regulator agrees, that the change makes a material improvement to the leakage estimate. Before any change is made, the company should provide a detailed assessment of how the change would have impacted on leakage reported in prior years of PC13 and demonstrate how the change would alter the leakage targets for PC13.

### 3.4 Security of supply

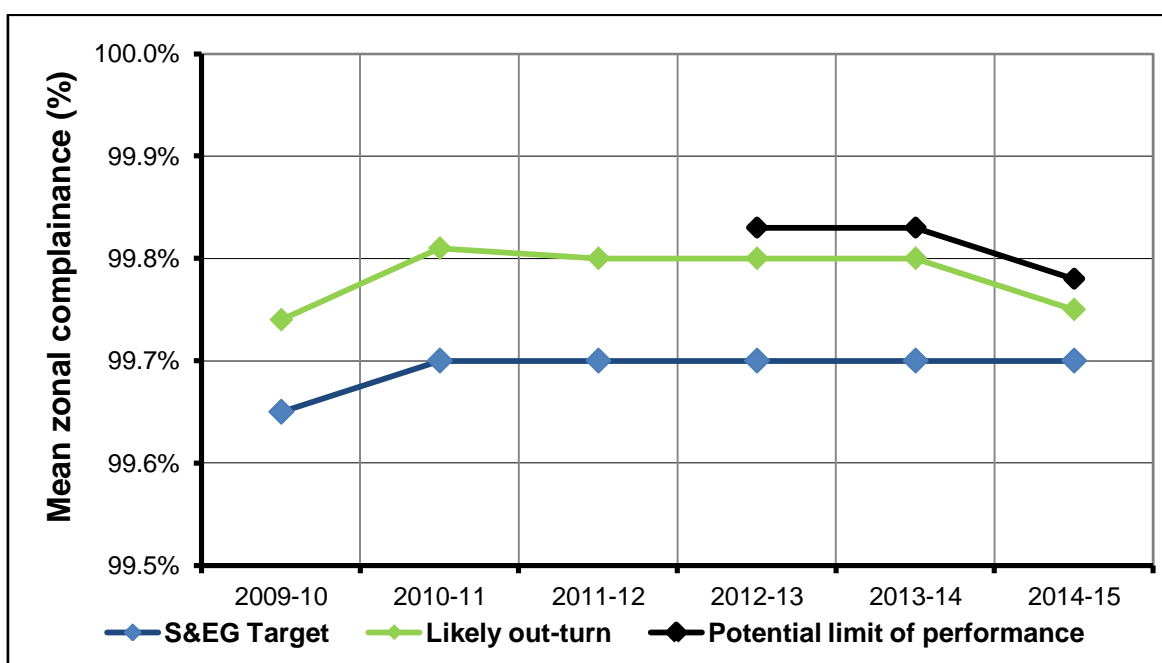
- 3.4.1 The company's security of supply index has increased significantly since the SBP period. Much of this improvement will have resulted from the improved assessment undertaken for the revision of the company's Water Resource Management Plan in 2011.

### 3.5 Mean zonal compliance with drinking water regulations

- 3.5.1 Mean zonal compliance (MZC) is a composite score based on 39 water quality standards measured through a statutory programme of random samples taken mainly at consumers' taps. It is a measure which is used to assess the overall quality of the water that consumers receive.
- 3.5.2 The quality of drinking water at consumer taps is determined by:
- The quality of treated water which NI Water puts into the distribution system.
  - Any subsequent deterioration of water quality in the distribution system.
- 3.5.3 NI Water's water treatment works have benefitted from significant investment over recent years and are generally capable of producing treated water which meets current safety standards. On-going investment is included in the determination to maintain the performance of treatment works and deal with known water quality issues. This will help to maintain the quality of treated water.
- 3.5.4 Some deterioration in water quality does occur in the distribution system. For example, iron can be picked up from corrosion products and lead can be dissolved from supply pipes, fittings and plumbing. The determination includes funding for mains rehabilitation which will allow the company to continue to address mains water quality issues and at least maintain water quality performance.
- 3.5.5 MZC will reduce in PC13 as a result of a significant change to one of the water quality standards. The Prescribed Concentration or Value (PCV) for lead will move from 25 µg/l to 10 µg/l on 25 December 2013. It is estimated that this tighter lead standard will cause MZC to fall by around 0.07% in 2014 compared to 2013. Further information on the work the company will carry out in PC13 to improve lead compliance is given in Section 3.10.
- 3.5.6 Mean zonal compliance is based on a process of random sampling which introduces some variability into the results without necessarily reflecting any change in underlying water quality. NI Water has proposed a target of 99.70% for MZC in PC13. This compares to current performance of around 99.8%. We

expect compliance to fall from current levels to around 99.75% in 2014 following the introduction of the new lead standard. The target proposed by the company is therefore one which we expect it to exceed in almost all circumstances. Taking account of current performance, changes in quality standards and the impact of proposed investment we expect that MZC will be in the range indicated in Figure 2.

**Figure 2 – PC13 - Mean zonal compliance range**



### 3.6 Operational Performance Index (Turbidity, Iron and Manganese)

- 3.6.1 The Operational Performance Index for Turbidity, Iron and Manganese (OPI[TIM]) provides an indicative measure of the deterioration of water quality in the distribution system due to corrosion products and long term precipitation of treatment products.
- 3.6.2 While some mains replacement in PC13 will target water quality issues the extent of work planned is not sufficient to make a material improvement in performance. We have continued the PC10 target of 99.1% for OPI(TIM) into PC13.
- 3.6.3 OPI(TIM) provides a weak surrogate for the appearance of water at the consumer tap. The company is working on a new system for identifying and prioritising work

on water mains which will take account of consumer feedback on the acceptability of water including taste, odour and appearance. We expect the company to reflect the outcome of this work in its Business Plan for PC15.

### 3.7 Water quality at service reservoirs

- 3.7.1 NI Water is not predicting any non-compliance with the measure for assessing water quality at service reservoirs in PC13.

### 3.8 Nominated outputs and activities

- 3.8.1 In its Business Plan the company identified specific activities or investment. These are summarised below along with our views of the company's submission.

#### **Water mains activity.**

- 3.8.2 The company plans to deliver 445km of new and renewed water mains through its water mains rehabilitation programme. In addition the company estimates that it will deliver a further 54km of water mains through its new and renew sub-programme. Proposed activity levels have been estimated from the available funding rather than a detailed assessment of the level of activity required to maintain performance and are slightly lower than in PC10.
- 3.8.3 These outputs have been accepted in the draft determination on the basis that serviceability appears to have been maintained during PC10 and because PC13 is a short duration price control period. For PC15 however we will expect the company to move from the current top-down approach to investment planning to a risk based bottom up approach for identifying appropriate levels of activity. This would allow the company to demonstrate the reasonable long term rate of key activities such as water mains rehabilitation and demonstrate that it can target asset maintenance expenditure to maintain and improve service levels.
- 3.8.4 The water mains rehabilitation programme sub-programme includes significant expenditure on four Major Incident Mitigation Projects aimed at improving resilience within the distribution system. The need for this work was identified during the PC10 period as a consequence of the problems experienced during the Freeze/Thaw event in 2010-11. The purpose of these schemes is to help mitigate against the impact of similar events in the future and they will be included as nominated outputs for PC13.

- 3.8.5 The detailed information provided by the company during the PC13 query process indicated a 50:50 split between urban and rural work for approximately three quarters of the PC13 water mains rehabilitation programme. There is nothing to indicate that this is not reflective of the entire PC13 programme. We will ask the company to report the actual urban/rural split to us annually during PC13 and will expect these proportions to be broadly maintained. If there is a material change, we will expect the company to adjust its overall output length accordingly or clearly demonstrate why it is not appropriate to do so. The approach used to determine the revised output lengths will be expected to be consistent with the assumptions adopted in the PC13 submission.
- 3.8.6 During PC13 we will work with the company to develop and agree the definition of urban and rural that is to be used for establishing targets and monitoring performance for PC15.

### **Trunk main schemes.**

- 3.8.7 The determination includes four nominated trunk mains outputs in PC13:
- Replacement of an existing strategic crossing of the M1 motorway. A new trunk main in Anderstown Road and Finaghy Road North will replace an existing section of burst main near Stockmans Way and restore previous levels of service to downstream consumers.
  - Ballydugan to Newry trunk main Phase 2b. This scheme will allow water to be transferred from Castor Bay WTW at Lough Neagh to secure supplies in the Newry area. Phase 1 and Phase 2a of this scheme are already in construction.
  - Gravity II McVeigh's Well to Oldpark SR. This scheme allows water from Dunore Point WTW at Lough Neagh and Dorisland WTW to be transferred across Belfast from north to south, improving the security of supply in this area.
  - Castor Bay to Belfast Trunk Main. This scheme will allow water from Castor Bay WTW at Lough Neagh to be fed to south Belfast by connecting to the Aquarius trunk main which is currently supplied from the Mournes. It addresses an emerging supply demand deficit in Belfast linked to development and improves both security and flexibility of supply. The scheme includes for upgrading the pumping station at Castor Bay WTW.

### **Water treatment works schemes.**

- 3.8.8 The determination includes two nominated water treatment works outputs in PC13:

- Upgrade to Killyhevlin WTW. The work is covered by a Consideration of Provisional Enforcement Order to address taste and odour issued to NI Water by the Drinking Water Inspectorate.
- Improvements to Killylane WTW to secure water quality compliance. The planned work generally consists of replacement and improvement of existing plant and will be delivered through the capital maintenance budget.

### **Service reservoirs and clear water tanks.**

3.8.9 The company will increase the capacity of one service reservoir in PC13 (Crieve). This delivers an output re-profiled from PC10 as a consequence of the PC10 change control process.

### **Other general investment**

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

- Complete the 'Metering and Treatment of WTW Effluents' project which commenced in PC10. This involves installation of meters to monitor water treatment effluent discharges to satisfy NIEA requirements.
- Make improvements to secure the safety of impounding reservoirs identified by the Panel Engineer in 2006.
- Carry out work to improve the security of service reservoirs and water treatment works.
- Continue to rehabilitate service reservoirs.
- Invest in project development, design and procurement to secure continuity of investment into PC15.

## **3.9 Connection of services**

3.9.1 The PC13 determination provides funding for the company to continue to make new connections to the water supply system. This includes service connections and requisitions as well as laying new water mains within new developments.

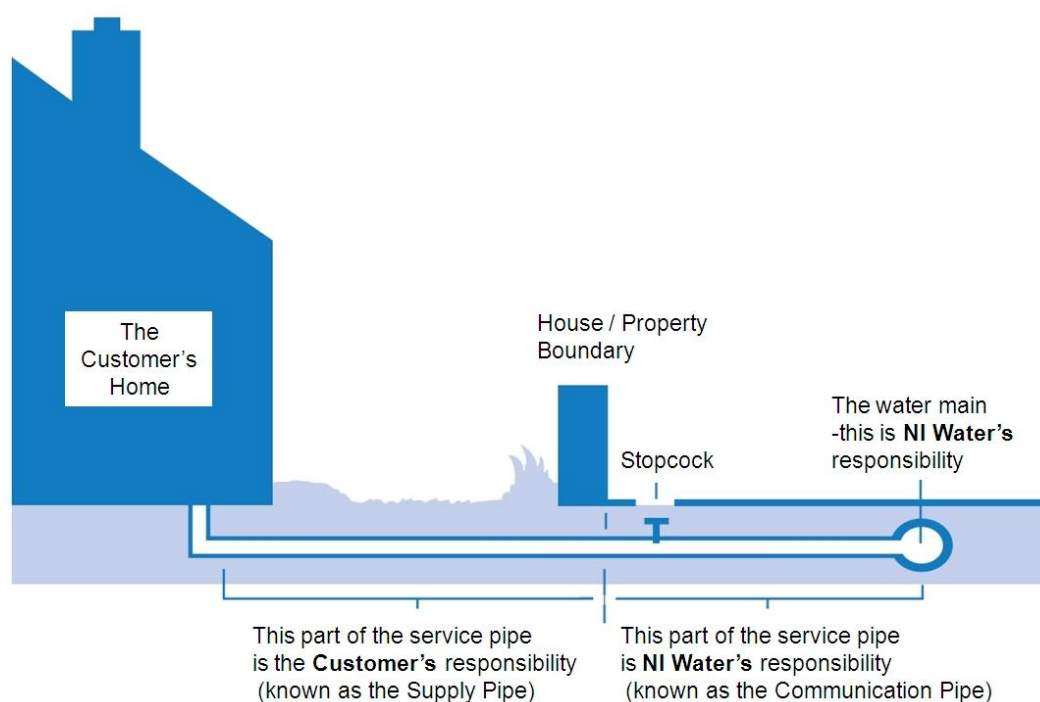
## **3.10 Water quality - lead compliance**

3.10.1 The medium term average for water quality failures for lead at consumers' taps is 0.8% against the current standard of 25 µg/l. In December 2013, the PCV for lead

will reduce to 10 µg/l. As a result, the average level of failures is likely to increase to around 3.2%. While the failure rate is established by limited sampling (about 400 properties selected at random each year), the long term average rate of failure could suggest that between 20,000 and 25,000 domestic properties would fail the new lead standard.

- 3.10.2 The quantity of lead in treated water put into distribution is almost zero. However, lead can be dissolved from lead pipes and fittings in the distribution system and domestic plumbing, causing the quality of drinking water to deteriorate. Recent regulation and practice means that lead is no longer used in either the water industry or in domestic plumbing, but there remains a legacy issue affecting older distribution systems and older properties.
- 3.10.3 The most common use of lead was in smaller pipes used in domestic plumbing and the 'service pipe' which connects a property to the water main. NI Water is responsible for the pipe from the water main to the boundary of the property (the "communication pipe" - see Figure 3). The property owner is responsible for the length of pipe from the property boundary to the property (the "supply pipe") and any internal plumbing. Lead dissolved from consumer supply pipes and plumbing can continue to generate compliance failures after NI Water has removed lead from its section of the distribution system.

**Figure 3 – Service pipe responsibility**





3.10.4 NI Water will take the following action to reduce water quality lead failures in PC13:

- Continue dosing ortho-phosphoric acid to drinking water supplies to reduce the rate at which lead dissolves into the water supply.
- Replace lead communication pipes on mains replaced by its water main rehabilitation programme.
- Replace lead communication pipes where a water quality test carried out as part of NI Water's normal operations, or at the specific request of a consumer, reveals a lead failure.

3.10.5 The company also proposes to invest £500k per annum in a proactive programme of communication pipe replacement targeting high risk areas. We have allowed this funding in the draft determination, but ask that the company expand on its proposal and demonstrate how the funding will be targeted for the final determination.

3.10.6 NI Water's programme of work will only have a limited impact on lead compliance. This is because a proportion of lead communication pipes removed will not currently result in a water quality failure because of the ortho-phosphoric acid dosing programme. In addition, lead sample failures may still occur because of lead supply pipes and internal plumbing even after the company replaces a lead communication pipe. As a result we have not assumed any material improvement in lead compliance in the MZC targets outlined in Section 3.5. Broader action to address lead pipes and fittings on consumers' premises will be necessary if full compliance with the water quality standards for lead is to be achieved.

## 3.11 Maintaining serviceability

3.11.1 An overall allocation of base maintenance funding has been provided to maintain stable serviceability across all assets during PC13. We will introduce formal serviceability monitoring in PC13 based on the following parameters:

- Number of mains bursts.
- % properties at risk of receiving low pressure (DG2)
- % properties affected by interruptions >12 hrs
- % mean zonal non-compliance - iron
- OPI(TIM)

- Customer contacts per 1000 population (Discoloured water)
- Pipe bursts resulting in interruptions to supply greater than 3 hours
- Distribution losses
- % Water Treatment Works samples containing coliforms
- % Service reservoirs with coliforms in >5% samples
- % Water Treatment Works with turbidity samples 95%ile >0.5NTU
- Events at Water Treatment Works affecting drinking water quality
- Unplanned (reactive) maintenance at water non-infrastructure sites

## 4 Sewerage Service Outputs

### 4.1 Sewer flooding

- 4.1.1 The need to reduce the risk of sewer flooding is consistently identified by consumers as a high priority.
- 4.1.2 We asked NI Water to develop a register of properties which are at risk of internal sewage flooding. Initially the company was not able to populate this register from the limited records maintained by its predecessor Water Service. By the start of PC10, the company had assembled records of historic flooding incidents and identified over 2,000 properties which might have been affected by flooding in the past. The company has since completed an initial assessment of these properties, and by March 2012 identified 213 properties which are at risk of flooding more frequently than 1 in 20 years due to limited hydraulic capacity in the sewerage system.
- 4.1.3 The company is now under-taking a series of feasibility studies which will confirm the risk and the potential extent of flooding for each property on its 'at risk' register.
- 4.1.4 For PC13, the company has proposed to address risk of flooding at 67 properties which are confirmed as at risk of flooding more frequently than once in 20 years. Of these 67 properties to be removed, we understand that 8 properties will be

removed from the higher risk 1 in 10 and 2 in 10 registers. The company has estimated the average unit cost of £90k, based on limited information of historic schemes.

- 4.1.5 While significant progress has been made, the company has not identified a clear set of prioritised flooding outputs for PC13 and a programme of work to deliver these outputs. In the absence of this level of information it is not possible for us to be confident that the determination contains the level of funding necessary to deliver the outputs. Therefore, we ask that the company provides a delivery programme for flooding outputs as part of its response to the draft determination. If we still do not have adequate detail to give confidence in the programme of work at that stage, we will ask the company to provide us with regular progress reports as the outputs are developed and delivered and keep us and other stakeholders informed on the prioritisation of outputs and the development of the at risk register.
- 4.1.6 Severe flooding across Belfast in June 2012 reinforced the distress and disruption which is caused when extreme storm events exceed the capacity of the sewerage system, flooding houses, businesses and transport infrastructure. However, it also provides an opportunity to review and confirm broader expectations on how a sewerage system should perform in extreme events. Current practice is to design the sewerage system for a 30 year storm event. As the company develops designs to upgrade the sewerage system, we would expect it to demonstrate what will happen when the design capacity of the sewerage system is exceeded. We also expect the company to work with other agencies responsible for land and road drainage and demonstrate that schemes it intends to deliver fit within an integrated approach to resolving drainage problems in an area.
- 4.1.7 During PC10, the company has often allocated historic flooding schemes to at-risk categories on the basis of the number of recorded flooding events and the return period for the associated rainfall event. The additional investigations, including hydraulic modelling, which the company will carry out as part of its on-going feasibility studies should confirm the risk of flooding and allow interventions to be prioritised. As new flooding events occur, we expect the company to complete further investigations, including hydraulic analysis, to confirm the risk of flooding as part of its assessment of the flooding incident. This will ensure that the at-risk categorisation provides a robust assessment of risk and a sound basis for the prioritisation of interventions.

## 4.2 Wastewater Treatment Works compliance

- 4.2.1 For PC13 we have reduced the number of performance targets we will monitor for numeric consents to cover.

- % WwTW's compliant with numeric consents; and,
- % population served WWTW compliant with numeric consents (excluding upper tier compliance).

It is our intention to agree the final definitions of these compliance parameters with both NIEA and the company prior to the Final Determination. This will also inform the PC13 monitoring plan.

- 4.2.2 For PC13, there is also a new separate compliance parameter, specifically for small WwTW's, serving populations of between 50 and 250.
- 4.2.3 The performance of WwTW can be affected by conditions which the company cannot control. Cold weather can affect the biological processes used in wastewater treatment and can result in reduced plant performance, thereby increasing the risk of non-compliance. Long periods of hot dry weather might reduce the irrigation of biological filter processes and reduce the efficacy of such treatment.
- 4.2.4 This is a particular issue for NI Water. Further investment is required in some treatment works which are in poor condition or are overloaded by development which occurred in the past. These works which are at high risk of failure in any year and are a focus of attention by NI Water. Whether they meet their consent conditions in any one year will depend not only on the skill of operations staff but whether conditions are favourable and also on the variability inherent in the sampling regime used to monitor the works.
- 4.2.5 The effect of this can be seen in targets proposed by NI Water for percent works compliant with numeric consents:

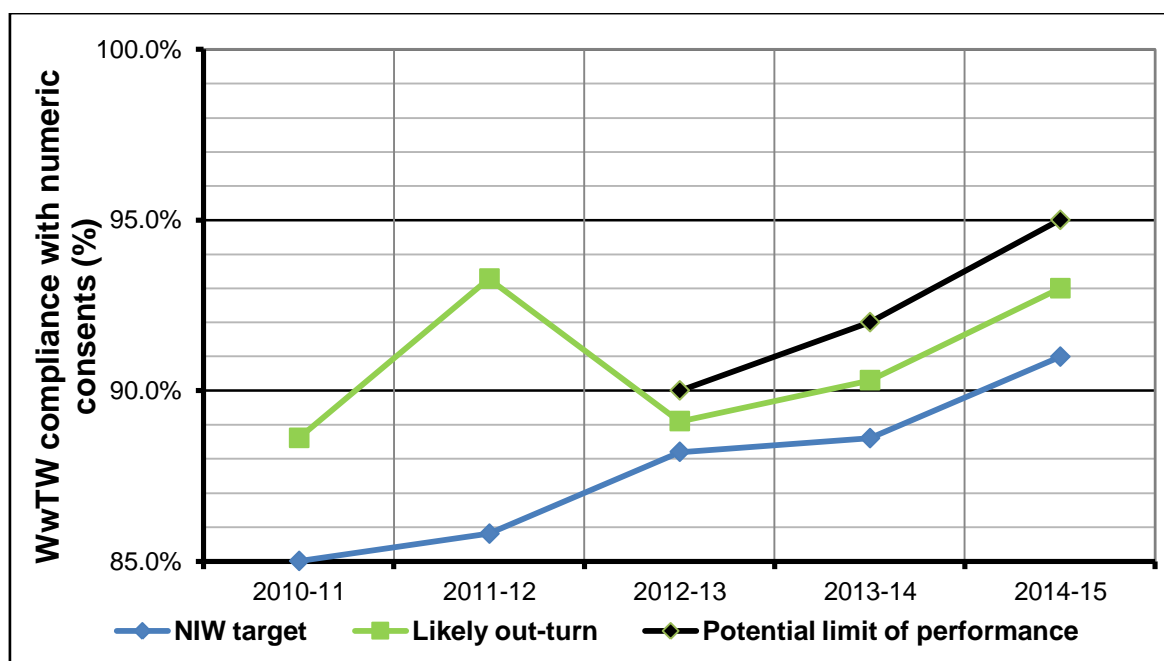
	Actual		Target		
	2010-11	2011-12	2012-13	2013-14	2014-15
% WwTW compliant with numeric consents	88.6	93.3	88.2	88.6	91.0
PC10 target	85.0	85.8	88.2		

- 4.2.6 The company attributes the reduction of 5% from actual performance in 2011-12 to target for 2012-13 to advantageous climatic conditions. The company proposed a target of 88.2% in 2012-13, consistent with the PC10 target, notwithstanding the fact that it has delivered better performance than this in the two preceding years.
- 4.2.7 We have concluded that the company has set targets at the lower end of the range of potential outcomes for these compliance standards. We have accepted this as appropriate – it would be unreasonable to set a target based on average levels of

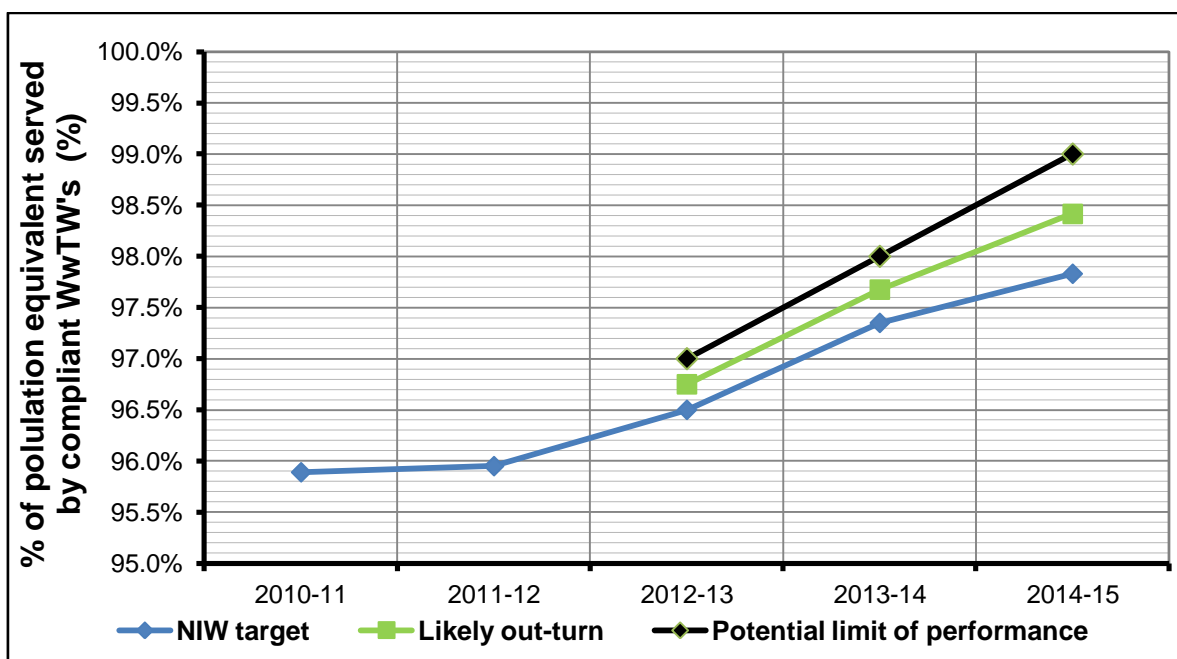
compliance which the company is likely to fail 50% of the time. However we would expect the company to operate above this target level.

- 4.2.8 The target proposed by the company is one which we expect it to exceed in almost all circumstances. Taking account of current performance, changes in quality standards and the impact of proposed investment we expect that WwTW compliance will be in the range indicated in Figure 4 below.

**Figure 4 – PC13 – WwTW compliance with numeric consents**



- 4.2.9 Similarly, we forecast that the company will deliver an improved performance in the percentage of population equivalent served by compliant works (excluding upper tier failures). Figure 5 below shows the potential operating range.

**Figure 5 – PC13 – % of population equivalent served by compliant WwTW's**

4.2.10 The NIEA has recently begun a more comprehensive assessment of the performance of small WwTW's. As a consequence, NI Water has now set targets for the compliance of works serving populations of between 50 and 250, which are excluded from the compliance targets stated above. We accept NI Water's proposed targets for small WwTW's and, given the paucity of data, have not proposed any additional figures for PC13. We will however consider these for PC15.

### 4.3 Pollution incidents

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

4.3.2 The company has also commented on the impact which rainfall has on pollution incidents. For example, the number of medium and high pollution incidents in the first half of 2012 is significantly lower than in previous years and the company attributes this to lower levels of rainfall. As a result there is a chance that the

company will out-perform its target for 2012 by a significant margin – but that will be dependent on climatic conditions and asset performance in the remainder of the year.

- 4.3.3 The company has targeted a small reduction in high and medium pollution incidents of 2 per annum over PC13. This target is based on an extension of historic trends. The company has outlined a series of initiatives it has put in place to reduce the frequency and severity of pollution incidents. However, the company has not been able to quantify the impact that these will have. Nor has it quantified the impact which the investment it has made, or proposes to make, will have on pollution incidents. It is not clear how the gap in performance with England and Wales will be closed and what level of investment will be required to achieve this. In its response to the draft determination we would welcome data and calculations from the company to support the target level of performance proposed.
- 4.3.4 In PC13, we expect the company to develop its strategy for reducing high and medium pollution incidents and demonstrate a clear link between performance and the capital and operational interventions proposed. We expect the company to provide us with regular updates on its methodology and progress on this work. The work should be completed to inform the PC15 Business Plan and future targets for reducing pollution incidents.

## 4.4 Nominated outputs and activities

- 4.4.1 Nominated outputs and activities have been identified for:
- the length of sewer replaced or relined;
  - improvements to unsatisfactory intermittent discharges;
  - improvements to wastewater treatment works; and,
  - improvements to small wastewater treatment works.
- 4.4.2 These nominated improvements deliver specific quality improvements required by NIEA and form an integral part of the outputs to be delivered. They also contribute to the improvement in overall wastewater compliance targets described in Section 4.2.

### **Sewers replaced or relined.**

- 4.4.3 The company plans to deliver some 70km of new sewers in PC13 and to renovate or renew approximately 26km of existing sewers. The proposed activity levels

have been estimated from the available funding rather than a detailed assessment of the level of activity required to maintain performance and are marginally lower than in PC10.

- 4.4.4 These outputs have been accepted in the draft determination on the basis that serviceability appears to have been maintained for the majority of the PC10 period and because PC13 is a short duration price control period the company. We note however that the company has forecast 'marginal' serviceability of the sewerage infrastructure network for the final year of PC10. For PC15 we will expect the company to move from the current top-down approach to investment planning to a risk based bottom up approach for identifying appropriate levels of activity. This is necessary to demonstrate that investment levels are reflective of needs and will require the company to develop a better understanding of asset performance and deterioration and establish clearer links between investment and outputs.

### **Nominated improvement to unsatisfactory intermittent discharges**

- 4.4.5 The draft determination allows for improvement to 96 unsatisfactory intermittent discharges (UIDs) to meet standards set by NIEA.
- 4.4.6 The company has provided a list of the UIDs which will be improved and individual project summaries. For the final determination we will require the company to provide additional information to clarify the scope of these schemes and confirm that they have been agreed with NIEA.

### **Nominated improvements to wastewater treatment works**

- 4.4.7 The draft determination allows for improvement to 34 wastewater treatment works with a population equivalent greater than 250 to meet discharge consent standards set by NIEA.
- 4.4.8 We have extended the nominated outputs to include 4 major treatment works improvement schemes identified by the company to secure compliance with the existing consent as part of the base maintenance programme.
- 4.4.9 The company has provided a list of these treatment works and their consent standards. For the final determination we will require the company to provide additional information to clarify the scope of these schemes and confirm that they have been agreed with NIEA.

### **Small wastewater treatment works upgrades**

- 4.4.10 The level of investment included in the final determination allows the company to upgrade a further 25 small wastewater treatment works serving a population



equivalent between 50 and 250, with the individual works to be prioritised by agreement between NIEA and NI Water.

## 4.5 Connection of services

- 4.5.1 The PC13 determination provides funding for the company to continue to make new connections to the water supply system including service connections and requisitions and laying new water mains within new developments.

## 4.6 Serviceability

- 4.6.1 An overall allocation of base maintenance funding has been provided to maintain stable serviceability across all assets during PC13. We will introduce formal serviceability monitoring in PC13 based on the following parameters:

- Number of sewer collapses
- Number of pollution incidents from sewer network (CSOs, rising mains and foul sewers)
- Number of sewer blockages
- Number of properties flooded due to other causes
- Number of equipment failures
- Areas flooded externally (other causes)
- Number of road openings for reactive investigations and repairs
- Number of Pumping Station emergency overflows triggered by equipment failure
- % Wastewater Treatment Works failing numeric consents
- % population equivalent served by non-compliant Wastewater Treatment Works
- % of Wastewater Treatment Works samples not meeting 95%-ile consent value
- Number of Wastewater Treatment Works with one or more sample failure
- Number of 'nuisance' small Wastewater Treatment Works

- Unplanned reactive maintenance at sewerage non-infrastructure sites

## 5 Management & General Investment and Outputs

- 5.1.1 Management & General investment covers a broad range of activities which the company must undertake to maintain or enhance the general facilities required to manage its business. For example, it includes: the provision and replacement of software; the provision of vehicles; and, collecting information and preparing and updating asset plans to support future operational planning and capital investment.
- 5.1.2 NI Water Business Plan includes investment of £24.7m under the heading of 'Management & General' over two years (nominal). The investment is allocated between base maintenance 59% allocated to base maintenance to replace and maintain existing facilities and 41% allocated to enhancing capability and the service provided to consumers.
- 5.1.3 We have reviewed the overall quantum of investment proposed against historic levels of investment in England and Wales. For PC10, we undertook an econometric comparison with Management and General expenditure in England & Wales support the level of investment proposed by NI Water. This analysis suggests that NI Water should invest of the order of £11m per annum in Management and General assets. On this basis, the level of investment proposed by NI Water appears to be reasonable. However, the company is committing almost half this investment to enhancement. We note the need for NI Water to assess the long term demand for base maintenance investment in Management and General assets to ensure that medium term investment proposed for PC15 is adequate.
- 5.1.4 NI Water has proposed a range of Management & General investment to enhance capability and services provided to consumers. The company submitted outline business cases to support this investment. The type and scope of the of activities proposed by the company generally appear to be beneficial. However, the company has not been able to quantify the benefits and opex savings which would provide the economic justification for the investment. Many of the business cases recognise this weakness and note that this information on KPI improvements and opex savings will be provided when a detailed Business Case is prepared. We have included the proposed investment in the draft determination however, we expect the company to provide an economic case enhancement investment which sets the work in the context of the broader company strategy and confirms the benefits which will be delivered. Where possible, the company should include this information in its response to the draft determination. Where this is not possible, the company should set out its programme for submitting more detailed business cases to us.

## 6 Preparing for PC15

6.1.1 In our information requirements for PC13 we asked the company to include the following information in its Business Plan in respect of the PC15 period:

- Estimates for projects which will carry over to PC15.
- Estimates of expenditure on rolling programmes expected to carry on into PC15.
- Indicative estimates of discrete projects expected to start in the first two years of PC15.
- Estimates of any preparatory work which should be carried out in PC13 to facilitate the start of construction in PC15.

6.1.2 The company's Business Plan:

- Identifies only one project with a material carry over into PC15.
- Identifies only one discrete project with a PC15 start.
- Includes £5.2m in PC13 preparatory work.

6.1.3 We are concerned that the profile of work carries significant risk to the medium term continuity of investment. We had hoped that by identifying discrete projects for the first two years of PC15 the company's plan would have included a higher level of investment committed in PC13 which would carry into PC15 thus securing continuity and flexibility between price control periods. A set of priority projects identified for the start of PC15 would also have provided target projects which could be accelerated in PC13 if necessary.

6.1.4 In its feed-back on the draft determination, we ask that the company sets out a plan for managing the continuity of investment and provides a programme for developing a basket of priority projects which could be brought into the PC13 period if planned projects are delayed or the level of funding is increased.

6.1.5 For PC13, the company has proposed investment in programmes of work which will deliver long term sustainable solutions, for example Sustainable Catchment Management (SCAMP) and energy efficiency. The company's proposal is for modest programmes of work which build on work carried out in PC10. We would expect the company to use the experience and evidence base that this initial work provides to develop a case for further, possibly increased, activity in these areas in PC15. Committing small levels of investment to build the evidence base for the future is a critical part of planning for the next price control. Therefore we ask that the company's response to our draft determination identifies the work it will carry

out in PC13 to develop the evidence base for sustainable development of water services, considering issues such as integrated wastewater catchment management, the implementation of sustainable urban drainage, water efficiency and low energy treatment processes. The company should confirm that it has allocated adequate funding in PC13 to undertake the assessments and pilot projects necessary to plan the sustainable delivery of water and sewerage services in PC15.

