



Northern Ireland Audit Office

Measuring the Performance of NI Water



REPORT BY THE COMPTROLLER AND AUDITOR GENERAL
16 June 2010



Northern Ireland Audit Office

Report by the Comptroller and Auditor General for Northern Ireland

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Measuring the Performance of NI Water

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K J Donnelly
Comptroller and Auditor General

Northern Ireland Audit Office
16 June 2010

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Abbreviations

the Committee	The Assembly Public Accounts Committee
CSOs	Combined Sewer Overflows
the Department	The Department for Regional Development
DWI	The Drinking Water Inspectorate (within NIEA)
ELL	Economic Level of Leakage
EU	European Union
GB	Great Britain
Mld	Million litres per day
MZC	Mean Zonal Compliance
NIEA	The Northern Ireland Environment Agency
NI Water	Northern Ireland Water
OPA	Overall Performance Assessment
OFWAT	The Water Services Regulation Authority in England and Wales
PC10	Final Determination of Price Control for the period 2010-2013
The Regulator	The Northern Ireland Authority for Utility Regulation
SELL	Sustainable Level of Leakage
THMs	Trihalomethanes
UK	United Kingdom
WICS	The Water Industry Commissioner for Scotland

Executive Summary



Executive Summary

The Water Reform process is intended to improve the quality and efficiency of water and sewerage services in Northern Ireland and in April 2007 responsibility transferred from the Department for Regional Development's (the Department) Water Service, to Northern Ireland Water (NI Water), a new company owned solely by Government. A system of economic regulation was also set up and the Northern Ireland Authority for Utility Regulation (the Regulator) was appointed to carry out this role. It was originally intended that domestic charging would be phased in by 2010. To date, however, the Executive has not introduced charging and in March 2010 legislation was introduced extending the Department's powers to make subsidy payments to 2013. No Executive decision has yet been taken on the future funding of NI Water. Because it continues to receive three quarters of its funding from the Department, NI Water is now treated as a non-departmental public body for public expenditure purposes.

Water Reform is one of the largest transformation projects in the public sector. It has the potential not just to improve this area of infrastructure, but also has major implications for the budgets of the Executive and all households in the region. This report benchmarks NI Water's performance with other UK providers at an early stage in this process.

The Department has stated that *"it supports the use of appropriate benchmarking to assess NI Water's performance but it has expressed reservations about the method used by the Regulator and the Northern Ireland Audit Office. It told us that other UK water companies have benefited from 20 years of sustained investment through customer charges and are privatised utilities during that period. The Department*

believes that benchmarking NI Water against these companies does not reflect the historical context of the water industry in Northern Ireland which has not had this level of investment or operational independence. It argues that assessing NI Water's performance against local priorities and targets which have been agreed by the Executive is more appropriate". It has also questioned the inclusion in the report of the Overall Performance Assessment (OPA) as *"a methodology devised to assess the performance of water companies in England and Wales. The Department believes the OPA produces a distorted picture due to underlying factors such as the size of the mains network and the stage of transformation of NI Water compared to English and Welsh companies"*.

Comparing NI Water with companies in England and Wales identifies a performance gap, however, the extent to which that gap is addressed is a decision which will be made within the context of the regulatory and public expenditure processes.

Drinking Water

Standards for drinking water are set out in the European Commission's Drinking Water Directive and the Northern Ireland Drinking Water Inspectorate (DWI) monitors NI Water's compliance on behalf of DRD. Between 2001 and 2008 some £587 million has been spent on projects to improve drinking water quality and compliance with standards has improved steadily from 99.38 in 2001 to 99.49 percent in 2008. This compares to compliance levels between 99.99 and 99.64 percent in the rest of the UK. The lower quality compared to GB is due primarily to failures on Trihalomethanes (THMs) which are

by-products formed when chlorine is used to disinfect water. Only two companies in GB had any THM failures in 2008.

The Regulator has stated that there are significant quality issues mostly, but not exclusively, related to THMs and the DWI has stated that significant improvement measures are needed on other parameters to progress compliance. The Department has stated that NI Water is not expected or funded to achieve parity with the UK and that compliance has already reached 99.7 percent, the level agreed by the Executive in the Social and Environmental Guidance for the 2010-2013 period. The Independent Water Review Panel report in 2007 questioned the cost effectiveness of aiming for increasingly exacting targets given that NI Water estimated the cost of achieving the English and Welsh average (99.96 percent) would cost around £242 million.

Where there is deterioration in the quality of drinking water with the potential to impact on consumer health, during the course of NI Water's day to day operations; these are categorised by DWI as incidents. The number of incidents has increased since 2003, partly due to improved reporting procedures and improved understanding by NI Water. Of the 29 incidents in 2008, three required boil water notices and 26 were within NI Water control.

Waste Water

The Northern Ireland Environment Agency (NIEA) sets standards for discharges from 250 of NI Water's larger waste water treatment works in line with the European Urban Waste Water Treatment Directive. The quality of discharges has improved from 58 percent compliance with standards in

2001 to 90 percent in 2008. This compares with virtually 100 percent compliance in England and Wales. The Department has agreed that work remains to be done but points out that the quality of waste water discharges in Northern Ireland is higher than it has ever been.

Consents are in place for over 800 smaller treatment works. These handle only two percent of the total sewage load, but have the potential to be locally polluting. Compliance at these works is not reported, but around 300 have been identified as 'unsatisfactory'. NI Water has set an annual budget of £5 million to address these on a priority basis.

Despite an undertaking given to PAC in 2000, overflows from sewer systems have not been fully assessed by NIEA. NI Water has identified 109 Drainage Areas and has completed 90 Drainage Area Studies. From 57 studies assessed, NIEA has identified 386 unsatisfactory discharges. This is 36 percent of discharges assessed and is in contrast to England and Wales where only 5 percent are deemed unsatisfactory. NI Water believes that it is important to recognise that many of these discharges are designed to operate only in cases of catastrophic failure. The Department questions the focus on constant monitoring of intermittent discharges because this is not required of NI Water or any other water company in the UK.

NI Water is responsible for nearly a quarter of all water pollution incidents in Northern Ireland – 1,237 incidents in 2008. This included 56 significant incidents which is six times the England and Wales average. The Department told us that as NI Water is the single largest body discharging to inland and coastal waters, the risk of pollution incidents is greater. It also has concerns about the comparison with England

Executive Summary

and Wales and believes that further work is required to establish whether it is valid because classification systems are not identical.

In 2007, two of the 23 designated bathing water sites in Northern Ireland – Newcastle and Ballyholme, failed to meet the minimum EU standards because of waste water problems. Fourteen sites failed to meet the higher standards required for Blue Flag status in 2008. Ballycastle lost its Blue Flag in 2008, with Portrush and Downhill following in 2009. The Department stated that environmental factors such as run-off from farmland and heavy rainfall can impact on water quality and that the lack of context with regard to bathing water compliance gives an unbalanced view of NI Water's performance.

Leakage

NI Water has reported substantial reductions in leakage, from 290 million litres a day in 2002, when nearly 40 percent of treated water was lost, to 157 million litres a day, or 25 percent of treated water in 2007-08. The Department reported that this was costing the taxpayer £5 million a year. Changes to methodologies and improvements in measurement have resulted in an increased estimate of leakage to 181 million litres in 2008-09.

Even if it was possible to eliminate leakage completely, it would be prohibitively expensive and OFWAT requires companies to calculate an Economic Level of Leakage (ELL) where it would cost more to make further reductions than to produce water from another source. Company performance is judged by the extent to which it achieves target reductions based on a soundly calculated ELL.

With the increased estimate of leakage in 2008-09, NI Water's previous ELL is no longer valid and current estimates of leakage are not considered robust enough to support regulatory target setting. An interim target of 166 million litres a day has been set for 2013. The calculation of a new ELL will be progressed with the Water Resource Action Plan and is expected by 2011.

Northern Ireland has a comparatively high level of leakage from customers' supply pipes which has been attributed to high flow rates, longer supply pipes and much longer repair times. To reduce repair times and therefore the length of time leaks run, a consultant's report has recommended that NI Water reconsider the economic case for free or subsidised repair of customers' supply pipes as a means of reducing leakage. Free or subsidised repair would only be economically viable if the cost of repair was less than the cost of the water saved.

The Department stated that the cost of repairs would fall on the Executive's budget reducing the funds available for other public services and that supply pipe leakage is not especially problematic in Northern Ireland at 27 percent of leakage compared to an average of 24 percent in England and Wales.

Customer Service

Customer service performance indicators have been set up for: water pressure; interruptions to supply; sewer flooding; and customer contact.

In 2008-09 low water pressure affected more properties in Northern Ireland than other parts of the UK, with 0.72 percent of properties at risk of low pressure in 2008-09. Under the OFWAT classification system this performance would

be regarded as 'needs improvement'. Planned investment in mains rehabilitation, together with improved data is likely to increase performance in this area to an 'acceptable' rating.

Unplanned interruptions to supply have reduced but there is scope for further improvement. Since 2000-01 the overall number of properties with interruptions lasting more than 6 hours has reduced from 23,000 to just over 8,000 in 2008-09. This performance would be rated by OFWAT as 'acceptable', but 609 properties had interruptions lasting more than 24 hours, far in excess of the target of 80 properties. Because of longer mains in Northern Ireland, it may not be possible to reduce this significantly without reducing the frequency of bursts well below GB levels.

Sewer flooding occurs when sewage escapes from the sewer system through a manhole, drain or toilet. UK companies are required to assess the number of properties at risk of sewer flooding and since 1990, these numbers have significantly reduced. Because it was not a regulatory requirement before April 2007, NI Water produced this information for the first time in 2007-08. The Regulator judged that this information was not robust enough to allow comparison with other UK companies. It is expected that the 2009 Information Return will provide the basis for targets and improvements in service to customers affected by sewer flooding.

The quality of customer contact functions are measured using a range of indicators covering billing, written complaints, meter reading and ease of telephone contact. NI Water is moving towards the average UK performance in this area.

Efficiency

Stakeholders agree that there is a significant operating efficiency gap compared to England and Wales. The Regulator estimates that to achieve comparable efficiency with GB companies, NI Water would need to deliver an improved level of service with half the level of operational funding. It has proposed an efficiency target of 6.5 percent a year which would deliver additional operating efficiencies of £26 million compared with NI Water's Business Plan. The Business Plan also sets out a capital programme to address many of the areas where performance could be improved and proposes efficiencies of £37 million. The Regulator has proposed additional efficiencies of £21 million which together with other adjustments gives a final programme figure of £564 million.

The Department stated that while NI Water continues to be largely publicly funded the Department needs to bid for the necessary resources in competition with other Northern Ireland spending priorities. As part of its spending review for 2010-11 the Executive agreed funding for that year, consistent with the Regulator's Final Determination. We understand that discussions are ongoing to reconcile years two and three of PC10 with the public expenditure process.

Part One:
Introduction



Part One: Introduction

The Water Reform process is intended to improve the quality and efficiency of water and sewerage services in Northern Ireland

1.1 Since 1973, water and sewerage services in Northern Ireland have been delivered by central government, most recently by Water Service, an executive agency of the Department for Regional Development (the Department). This was in contrast to the position in the rest of the United Kingdom. Since 1989, services in England and Wales have been provided by ten privatised water and sewerage companies and eleven water only companies. In Scotland, services are provided by Scottish Water, a statutory corporation formed in 2002 by the amalgamation of three water authorities. These companies are financed by charges and are subject to economic regulation by the Water Services Regulation Authority (OFWAT) in England and Wales and the Water Industry Commissioner for Scotland (WICS).

1.2 From 2002, it became increasingly obvious to government in Northern Ireland that reform of water and sewerage provision was required to improve services in line with other parts of the United Kingdom. Standards of drinking water and particularly of waste water treatment were below European Union requirements, risking infraction proceedings and potentially costly fines. Investment of some £3 billion was required to upgrade infrastructure and there was a need to improve efficiency.

1.3 In April 2007, responsibility transferred from Water Service to Northern Ireland Water (NI Water) a company owned solely by government with the Department representing the government's shareholder interests. The company was set a number of objectives to:

- deliver substantially better quality services more efficiently;
- manage the business within the financial parameters agreed in its Strategic Business Plan;
- achieve the maximum affordable improvements in environmental compliance in both waste water treatment and drinking water quality;
- enhance shareholder value and provide returns that match or exceed the industry/regulatory cost of capital; and
- strive to outperform the efficiency and other targets set within the Strategic Business Plan.

Along with the transfer of responsibility to the new company, a system of economic regulation similar to the rest of the United Kingdom (the UK) was also put in place and the Northern Ireland Authority for Electricity Regulation, which was already responsible for the gas and electricity utilities, was appointed under the Water and Sewerage Services (NI) Order 2006 to carry out this role and was renamed the Northern Ireland Authority for Utility Regulation (the Regulator).

1.4 Water Service had been funded as part of the Department, with some income from charges paid by non-domestic users. It was originally intended under Direct Rule that NI Water would become self-financing through the phased introduction of domestic charging over a three year period preceding the Regulator's first Price Review in 2010. In 2007, following the return of devolved government, the Northern Ireland Executive (the Executive) postponed the introduction of charging and commissioned an independent review of the longer term financing of water and sewerage services. The Independent Review Panel recommended that charging should be introduced from April 2009, after making allowance for an element of water charges deemed to be included in Rates payments. To date, however, the Executive has not introduced charging. NI Water continues to charge non-domestic customers but in the absence of domestic charging, the majority of funding is provided by a subsidy from the Department¹. In March 2010 legislation was introduced extending the Department's powers to make grant payments to 2013. No Executive decision has yet been taken on the future funding of NI Water.

1.5 Because the Department funds about three quarters of NI Water's expenditure, the Office of National Statistics has concluded that NI Water should be treated as a non-departmental public body for public expenditure purposes although legally it remains a government owned company. The Department told us that *"this raises inconsistencies with a legislative framework designed for a regulated*

self-funding utility. The Department has general duties to ensure that NI Water's functions are properly carried out and financed, is the sole shareholder in NI Water, is responsible for paying NI Water's subsidy and can issue general Social and Environmental Guidance to the Regulator. However, the Department does not have statutory powers to set targets for NI Water (as might be the case with an NDPB) and has a limited role in enforcing NI Water's duties and performance. The Department's main role on enforcement lies on drinking water quality, exercised through the Drinking Water Inspectorate. Other enforcement powers in respect of NI Water's performance – including waste water, leakage and customer service – were delegated to the Utility Regulator on creation of NI Water in April 2007".

NI Water is subject to regulation by a range of public sector bodies

1.6 NI Water provides services to some 800,000 properties, with an annual budget in excess of £400 million and a fixed asset value of £1.1 billion including 26,500 kilometres of water mains, 14,500 kilometres of sewers and some 1,120 treatment works. It is also subject to a similar regulatory regime to other water and sewerage companies in the UK.

Northern Ireland Authority for Utility Regulation

The Regulator is a non-Ministerial government department responsible to the Northern Ireland Assembly. Its statutory

¹ Water and Sewerage Services (Northern Ireland) Order 2006, Article 213 as amended by the Water and Sewerage Services (Amendment Act) (Northern Ireland) 2010.

Part One: Introduction

duties in relation to NI Water under Article 6 of the Water and Sewerage Services (NI) Order 2006 (the Order) include primary duties which the Regulator must carry out in a manner that it considers is best calculated (a) to protect the interests of consumers (b) to secure that NI Water's functions are properly carried out as respects every area of Northern Ireland, and (c) to secure that NI Water is able to finance the proper carrying out of its functions. In discharging these duties the Regulator ensures that customers receive value for money by setting price limits based on an assessment of the lowest reasonable costs and revenues required to deliver water quality, environmental and customer service objectives. It effects this through a regulatory price control process having regard to the Minister's Social and Environmental Guidance, which reflects consumers' views and quality regulators' statutory output requirements. In accordance with the Order and NI Water Licence, the Regulator scrutinises, approves and consults on NI Water's annual Scheme of Charges to ensure that they are compliant with price limits. The Regulator also monitors NI Water's performance requiring an annual information return and publishing a cost and performance report.

The Department told us that while NI Water continues to be publicly funded, the Regulator can only identify resource requirements. The Department will have to bid for those resources in competition with other Northern Ireland spending priorities.

Drinking Water Inspectorate

Drinking Water Inspectorate (DWI) is a unit within the Department of Environment's Northern Ireland Environment Agency which regulates drinking water quality on behalf of the Department. It assesses quality against regulatory standards, inspects NI Water's sampling and analytical processes, carries out checks on NI Water's operational sites and publishes an annual report on drinking water quality. Where necessary, DWI may take enforcement action against NI Water on behalf of the Department.

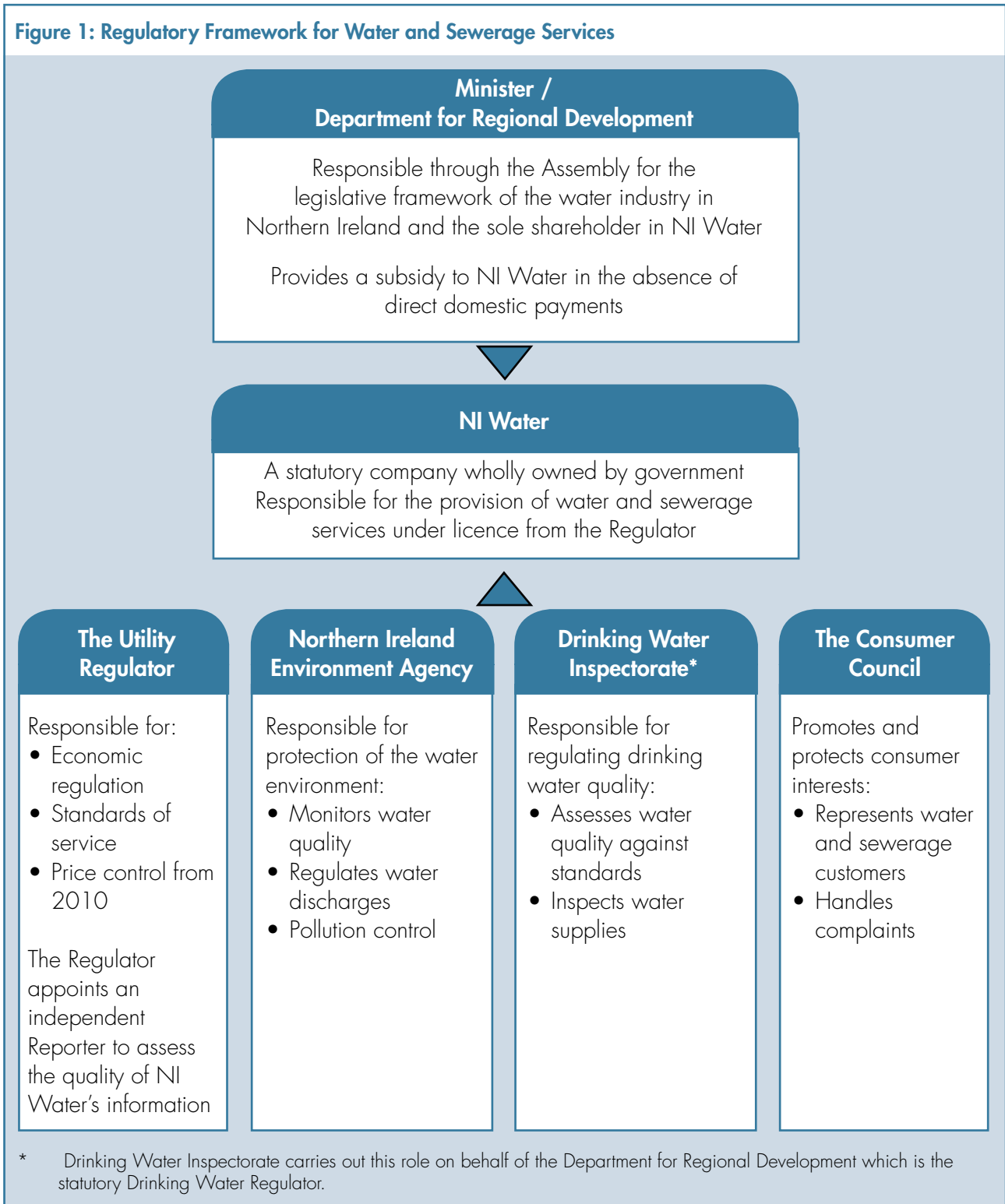
Northern Ireland Environment Agency

The Northern Ireland Environment Agency's Water Management Unit regulates all discharges to waterways under the Water (Northern Ireland) Order 1999, inspects wastewater sampling and analysis processes, regulates all water abstraction and associated reservoirs, publishes a report on compliance with discharge standards and may prosecute for the pollution of waterways.

Consumer Council for Northern Ireland

The Consumer Council acts as consumer representative for water and sewerage customers it ensures that policy makers take account of consumer views through the provision of information, education and research. It also assists individual consumers in the resolution of complaints.

Figure 1: Regulatory Framework for Water and Sewerage Services



Part One: Introduction

This report benchmarks NI Water's performance with other UK providers at an early stage in the Water Reform process

- 1.7 With the transfer to a government owned company in 2007, the Department agreed a Strategic Business Plan with NI Water to cover the three year period before the Regulator's first Price Review in 2010. The Plan set targets for a number of key performance indicators to improve the quality and efficiency of service delivery, while recognising the unique context and operating arrangements of the new company. These key performance indicators are also used in England, Wales and Scotland. NI Water has reported good progress in the last two years and in 2008-09 it met or exceeded target performance in 17 of 26 performance indicators where targets had been set. This included delivering the best ever drinking water quality and waste water treatment in Northern Ireland. Details of performance against Strategic Business Plan targets for the main service areas examined in this report are at Figure 2. Full details of all key performance indicators are at Appendix 1.
- 1.8 The Water Reform process, the creation of NI Water as a government owned company and the various initiatives which it is bringing forward is one of the largest transformation projects in the public sector. Its success has the potential not just to improve this vital area of infrastructure, but also has major implications for the budgets of the Executive and all households in the region. This report seeks to establish the benchmarks for NI Water's performance at an early stage in the process, bringing

together performance information from a number of different sources, most of which is already in the public domain. The report examines each area of service delivery in detail, including an analysis of performance over time and benchmarking with the rest of the UK industry using key performance indicators.

The Regulator has completed its first Price Control Review taking account of the Department's Social and Environmental Guidance

- 1.9 The Regional Development Minister has issued Social and Environmental Guidance setting out the NI Executive's priorities for water and sewerage services. As part of the regulatory process set up under Water Reform, the Department has powers to issue guidance on key social and environmental policies which the Minister expects the Regulator to contribute to as part of the price control process. The Department issued the draft Social and Environmental Guidance in March 2009 which set out its strategic priorities of: affordability, EU compliance, service delivery, and sustainability. It also gave details of how each of these priorities could be addressed and contained indicative figures of what funding was likely to be available. Working from this, NI Water submitted a detailed business plan which was assessed by the Regulator. In its Final Determination of the Price Review for the period 2010-13 (PC10) in February 2010, the Regulator made recommendations on operational and capital funding and set efficiency targets.

Figure 2: Key Performance Indicators
Northern Ireland Water Strategic Business Plan 2007-2010

	2007-08		2008-09		2009-10	
	Target	Actual	Target *	Actual	Original Target	Current Target
Drinking Water Quality Mean zonal compliance (%)	99.44	99.30	99.35	99.49	99.77	99.65
Waste Water Quality Population equivalent compliant (%)	82.5	84.38	89.0	90.24	94	93.50
Pollution incidents (high/medium)	46	60	56	56	11	56
Leakage - million litres per day	157	156.52	146	180.9	135.5	176.93
Inadequate Pressure (%)	#	#	#	#	#	945 properties removed
Supply Interruptions (%) >6 hours	2.00	1.35	1.2	1.094	1.00	1.00
>12 hours	0.25	0.25	0.15	0.259	0.15	0.15
>24 hours	0.03	0.03	0.01	0.077	0.01	0.01
Sewer Flooding Sewer overload	#	#	#	#	#	#
Other causes	#	#	#	#	#	#
Risk of flood more than once in ten years	#	#	#	#	#	102 properties removed
Customer Contact Response to billing contacts (%)	96	94.97	97	98.6	98	98
Response to written complaints (%)	96	90.61	97	97.6	98	98
Billing of metered customers (%)	95	95.14	95	93.25	95	95
Ease of telephone contact (%)	93	94.78	95	97.09	96	98

* - 2008-09 Targets were not set in the Strategic Business Plan, the targets shown are taken from NI Water's 2008-09 Annual Report

- not measured/no target Green figures – target achieved Red figures – target not achieved

Note – NI Water is developing the methodology for the measurement of efficiencies in conjunction with the Department and the Regulator. NI Water has reported these as "on track for achievement" on the basis that efficiencies have been deducted from annual budgets.

Part One: Introduction

1.10 The Department has taken account of the Final Determination for PC10 in assessing the funding requirements for the next three years which it has published in its final report on the Social and Environmental Guidance which was agreed by the Executive on 15 April 2010 and laid before the Assembly on 21 April 2010. Total funding of £1.2 billion has been proposed, including £400 million in the first year. Because, in the absence of charging, the majority of funding is provided by the Executive and is tied to the public expenditure cycle, figures for years two and three are provisional. Discussions on reconciling PC10 and the Final Determination with the public expenditure process are ongoing amongst stakeholders. The Regional Development Minister has said that he will look at all governance options going forward².

The Department has questioned the methods of assessing NI Water's performance used by the Regulator and the Northern Ireland Audit Office

1.11 When comparing NI Water in its first years of operation with companies in England and Wales it is important to recognise that these companies have had the benefit of economic regulation for twenty years. Over that period they have been able to invest at double the pre-privatisation level – some £80 billion; and have consistently improved efficiency with each price review. NI Water is currently transforming itself from a central government body to a commercial organisation and the Regulator has acknowledged that a fair assessment

of NI Water's performance must take account of its legacy of poor data, weak systems and underperforming assets.

1.12 The Regulator has adopted the Overall Performance Assessment (OPA) methodology to summarise NI Water's performance. This methodology was originally developed by OFWAT as a means of measuring and comparing the performance of water companies in England and Wales, by giving a points score for 17 performance indicators. This approach is also used by WICS in Scotland. For 2007-08, the Regulator gave NI Water a total OPA score of 98 points out of a possible 304 and expects this score to rise to 204 by the end of the PC10 period. Full results of the 2007-08 OPA are at Appendix 2.

1.13 The Department has stated that *"it supports the use of appropriate benchmarking to assess NI Water's performance but it has expressed reservations about the method used by the Regulator and the Northern Ireland Audit Office. It told us that other UK water companies have benefited from 20 years of sustained investment through customer charges and are privatised companies which have been run as regulated utilities during that period. The Department believes that benchmarking NI Water against these companies does not reflect the historical context of the water industry in Northern Ireland which has not had this level of investment or operational independence. It argues that assessing NI Water's performance against local priorities and targets which have been agreed by the Executive is more appropriate"*.

- 1.14 The Department has also questioned the inclusion in the report of the OPA. The Department believes it is not appropriate to use OPA scores to directly compare NI Water with other companies because *“it was devised for comparing utilities at a more advanced stage of development and uses different definitions of input data to those employed in Northern Ireland”*. The Department stated that the Minister’s Social and Environmental Guidance which has been agreed by the Executive does not focus on OPA scoring but agree a number of measures which are consistent with those used in GB. Summaries of the Regulator’s and the Department’s views on OPA are at Appendix 2.
- 1.15 It is the Northern Ireland Audit Office’s view that benchmarking against industry or best practice standards enables organisations to identify where and to what extent performance could be improved. Benchmarking has been central to the regulation of the water industry in the UK since privatisation, providing a proxy for competition and acting as an incentive for companies to outperform their peers. It also informs customers and other stakeholders about the overall performance of their water provider. We note that NI Water’s Strategic Business Plan, agreed with the Department in 2007, did benchmark with the GB water industry, identifying a considerable performance gap and specifically stating its overall aim to match or exceed the performance of similar companies. The plan stated that the second phase of transformation, now covered in large part by the Regulator’s Price Review, was to be *“focused on identifying and delivering the benchmark GB industry standards in customer service, efficiency and environmental performance”*. The Department told us that the Strategic Business Plan was a Direct Rule document and therefore does not necessarily reflect the views of the Executive or the Minister.
- 1.16 Comparing NI Water at this early stage in its development with companies in England and Wales identifies a performance gap and the Regulator has stated that, while not without cause in some cases, this level of service is unacceptable for local consumers. We note the Department’s assertion that parity with England and Wales could only be achieved at higher cost and recognise that resource constraints will be an important consideration in any future plans. However, we also note the Regulator’s view in the Final Determination for PC10 that experience in the rest of the UK indicates that once initial efficiency gains are made, large scale improvement in performance is possible without increasing expenditure. Ultimately, the extent to which any performance gap is addressed is a decision which will be made within the context of the economic regulatory process, taking full account of European standards, Ministerial Social and Environmental Guidance, resource requirements and consumer views. The Department told us that in the current funding circumstances it would be more accurate to state that the extent to which the performance gap is addressed will be influenced by the NI Executive’s decisions on the allocation of resources.

Part Two:
Drinking Water Quality



Part Two: Drinking Water Quality

Standards for drinking water are set by European and Northern Ireland legislation and quality is monitored by the Drinking Water Inspectorate

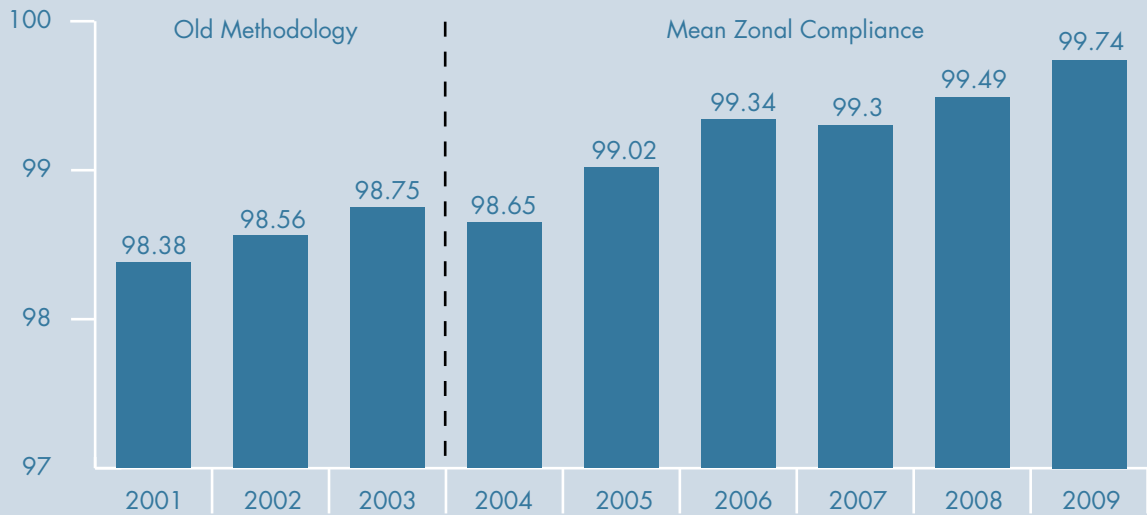
- 2.1 NI Water delivers over 600 million litres of water every day to some 800,000 households and businesses for drinking, washing, cooking and food production. To ensure that water is clean and safe to drink, it must meet the standards set out in the European Commission's Drinking Water Directive³ along with some more stringent UK national standards. These standards set limits for 40 individual parameters of drinking water quality at the customers tap covering aspects of health, appearance and taste. NI Water carries out an on-going programme of testing for compliance with drinking water quality standards. In 2007, NI Water tested over 52,000 samples for water quality at customer taps. Over 99 percent of these tests complied with water quality standards. Details of test results and the measurement methodology using Mean Zonal Compliance are at Appendix 3.
- 2.2 The Drinking Water Inspectorate (DWI), which is a unit within the Northern Ireland Environment Agency, is responsible for regulating the quality of public drinking water on behalf of the Department for Regional Development. DWI provides guidance on how testing should be carried out and undertakes checks to ensure that it has been carried out to the required standard. DWI publishes an annual report which is intended to provide public reassurance on the integrity of NI Water's test results.

Drinking Water Quality has improved steadily since 2001

- 2.3 Between 2001 and 2008, NI Water and its predecessor Water Service have invested some £587 million on water treatment and infrastructure capital projects to improve drinking water quality. This has resulted in an increase from 98.38 percent compliance with quality standards in 2001 to 99.49 percent in 2008. Compliance reduced slightly in 2007 and this has been attributed to a reduction in 'raw' water quality. DWI told us that this is because water treatment processes are not robust enough to cope with 'extreme weather events' such as wetter summers. In 2008, there was an improvement in drinking water quality exceeding NI Water's target of 99.35 percent (see Figure 3). This compares to compliance levels ranging between 99.99 percent and 99.64 percent in the rest of the UK (see Figure 4). In 2009, drinking water quality had risen to 99.74 percent.
- 2.4 The Final Determination for PC10 provides (subject to funding) for approximately £100 million on an enhancement programme to improve water mains, treatment works and storage in the three years to 2013. The Alpha Project, a Public Private Partnership, with a capital cost of some £110 million, has upgraded five existing water treatment works which provide around half of Northern Ireland's water. These projects are intended to raise drinking water quality in Northern Ireland to 99.7 percent by 2010-11. A Case Study covering a capital investment

3 Council Directive 98/83/EC which relates to the quality of water intended for human consumption came into force on 25 December 2003 along with more stringent UK national standards for some parameters. These requirements are incorporated into Northern Ireland legislation by the Water Supply (Water Quality) Regulations (Northern Ireland) 2007.

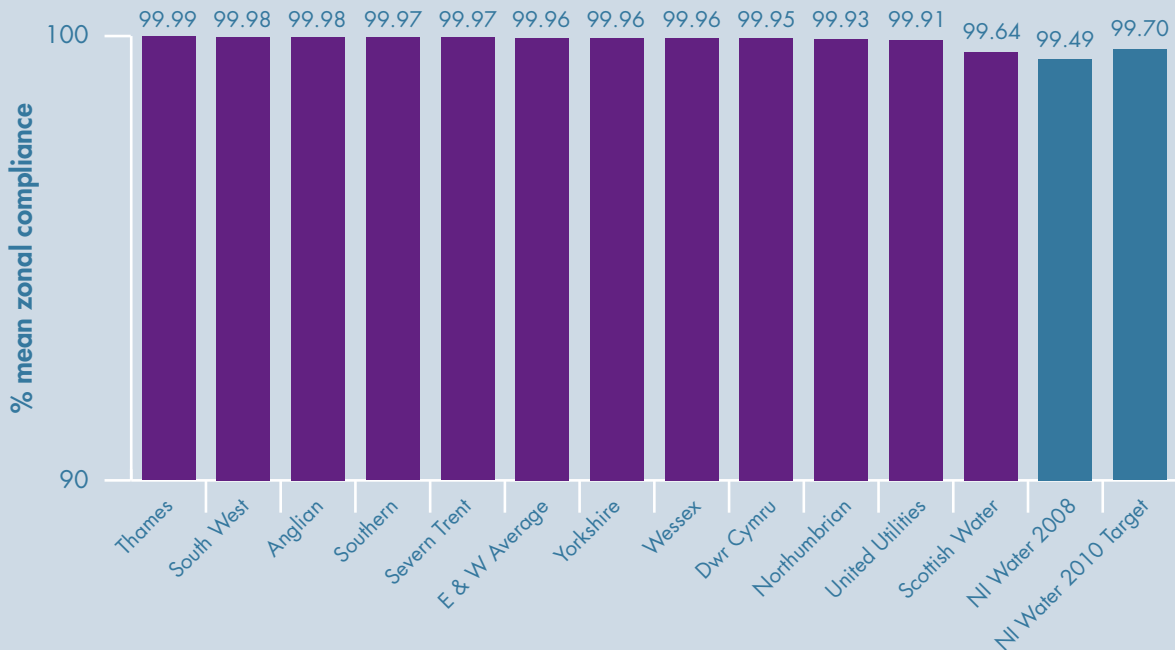
Figure 3: Northern Ireland Drinking Water Quality 2001 to 2009 (percentage compliance)



Source: NIAO based on NI Water and DWI data

Note: The apparent dip in performance between 2003 and 2004 reflects the change in measurement methodology to a mean zonal compliance approach from 2004. Further details are at Appendix 3.

Figure 4: UK Drinking Water Quality (percentage mean zonal compliance 2008)



Source: NIAO based on NI Water, OFWAT and Scottish Water data

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project commissioned in 2006 is provided for illustrative purposes in the box below.

NI Water Capital Investment Project : Fofanny Water Treatment Works

The new Fofanny Water Treatment Works was completed in 2006, at a cost of £18 million. It treats 50 million litres of water a day and provides high quality drinking water to over 100,000 consumers across South Down and parts of Armagh. This Water Treatment Works (the Works) is a state-of-the-art facility and the only underground water treatment works in Ireland. It is an outstanding example of how, what is effectively an industrial building, can be designed and built to merge effortlessly with its surroundings.

The Works was built near Fofanny Dam in the heart of the Mourne Mountains, a designated 'Area of Outstanding Natural Beauty', part of the Countryside Policy Area and a candidate for National Park status. It replaced the old highly visual Fofannybane plant, promoting a more attractive environment and safe guarding the supply of high quality water for many years to come.

Environmentally-friendly features were incorporated into all elements of the design process. The Works operates mainly by a gravity feed system reducing the need for pumping. To maximise sustainability, a turbine was installed which creates green energy and amounting to 10% of that needed to run the entire plant. Also, the roof of the treatment works has been landscaped with a special mix of indigenous vegetation including over 10,000 native species of heathers and 4,000 shrubs.

NI Water has won a range of awards for its innovative design and sustainable environmental construction including :

- 2006: First prize in Achieving Excellence (Public Sector category) – Construction Employers Federation
- 2007: The national gold award for Public Facilities - Green Apple Awards
- 2007: Utility Industry Achievement Awards - Environment Award
- 2009: Edmund Hambly Award – Institution of Civil Engineers, which recognises contribution to sustainable development

Also, in 2009, NI Water's Project Manager was runner up in the George Dawson Award - organised by 'Business in the Community' to celebrate the significant contribution made by a business person to improving the environmental performance of their organisation.

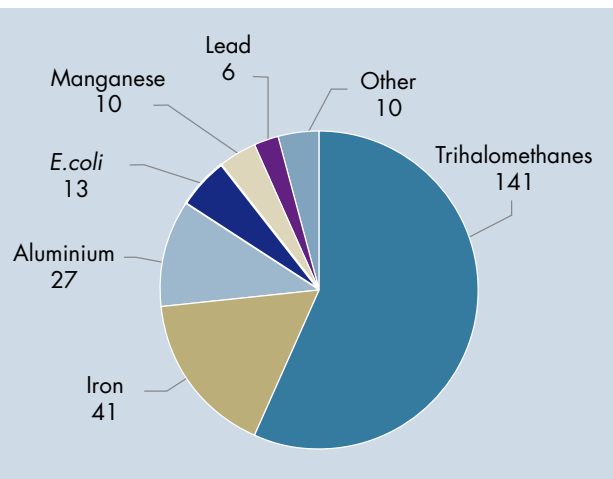
The Fofanny Water Treatment Works has become part of the attraction within the Mournes which attracts thousands of visitors every year. Specially designed storyboards show passers-by the work that has been undertaken in the area over the past two years and only aerial photographs detailing the temporary scars of construction enable one to imagine that any plant or machinery was once deployed there.

Source: The Department and NI Water

The difference in drinking water quality compared to UK is due to failures on a small number of prescribed standards

- 2.5 Of the 52,000 samples carried out by NI Water to measure drinking water quality at consumers' taps in 2008, there were a total of 248 failures relating to thirteen parameters. For details of the parameters see Appendix 3. One parameter, Trihalomethanes (THMs) accounted for nearly 60 percent of the failures (see Figure 5).
- 2.6 THMs are a group of four chemicals that are formed as by-products when chlorine is used to disinfect water containing naturally occurring organic substances such as peat, which are routinely found in the sources from which NI Water draws much of its supply. Production of THMs can be minimised by removing this material prior to disinfection and by optimising chlorine levels. Compared to the overall compliance level of 99.49 percent in 2008, compliance with THM standards is much lower at 86.43 percent. The levels of THMs in Northern Ireland are high compared to the rest of the UK where only two companies had any failures in 2008 (see Figure 6).

Figure 5: Drinking Water Parameter Failures 2008



Source: NIAO based on DWI data
 Note: Failure rates here do not take account of sample sizes for each parameter. For this reason Mean Zonal Compliance results do not match this pattern exactly. For example the Mean Zonal Compliance for 'Lead' is the third lowest after Trihalomethanes and Iron.

Some Water Treatment Works have Authorised Departures in place while improvement works are carried out

- 2.7 Where water treatment works do not consistently meet the prescribed standard, the EU Drinking Water Directive allows for member states to permit a time-

Figure 6: Comparison of THM Failure Rates 2008

Water and Sewerage Company	Population	Number of failures	Failures per 100,000 Population
NI Water	1,775,000	141	7.96
Scottish Water	4,989,389	81	1.6
Southern	2,331,000	1	0.043

Source: NIAO based on NI Water, OFWAT, GB DWI and Scottish Water data

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bounded less stringent standard in certain circumstances. These are known as 'Authorised Departures'. DWI may grant an Authorised Departure for certain parameters, provided:

- there is no risk to public health
- a maximum value is set for the parameter
- there is a defined authorisation period, not exceeding three years, and
- remedial works are undertaken to address the deficiencies in treatment.

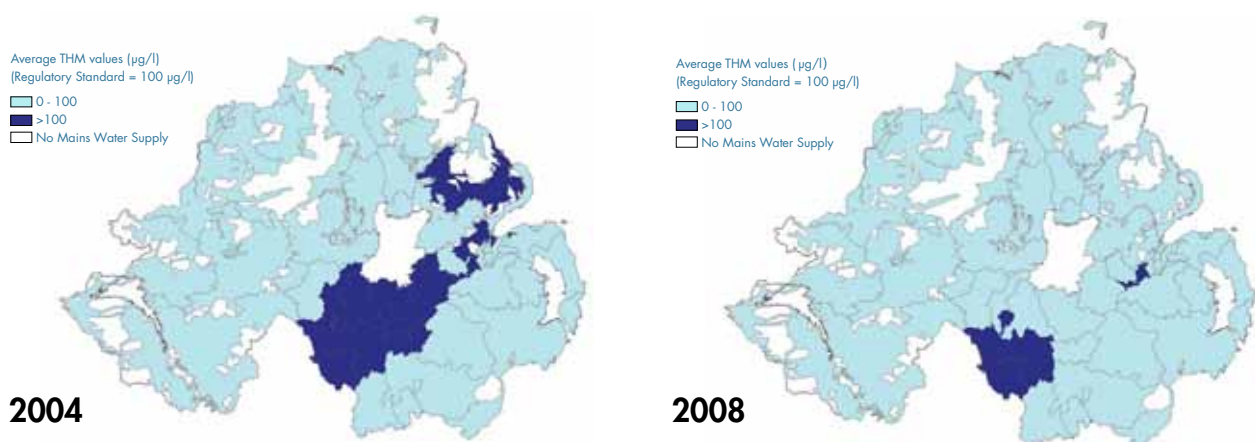
2.8 The number of Authorised Departures has reduced from 85 in 2004 to 25 in 2008. These affect the water supply to an estimated 851,000 people across 23 water supply zones with, 23 for THMs and two for pesticides (see Figure 7). Authorised Departures relating to aluminium

were completed by 2006 and 22 relating to THMs were due to expire by December 2009. By the end of 2010 it is expected that only one Authorised Departure will remain, affecting some 17,000 people (see Figure 8). The cumulative effect of these improvements will be to increase drinking water compliance by an estimated 0.4 to 0.45 percent; contributing to the overall target of 99.7 percent.

The significance of the performance gap compared with the rest of the United Kingdom requires careful interpretation

2.9 The difference in compliance levels between NI Water and the England and Wales average when using mean zonal compliance appears very small, at less than one percent. The significance of this performance gap has important implications for future investment. NI Water has estimated that it would cost an

Figure 7: Water Supply Zones above prescribed level of THMs 2004 and 2008



Source: DWI Report - Drinking Water Quality In Northern Ireland 2008

Figure 8: Authorised Departures 2004 to 2009

Parameter	2004	2005	2006	2007	2008	2009	2010 Target
Aluminium	32	29	8	-	-	-	-
THMs	53	48	30	24	22	22	1
Pesticides	-	-	1	3	3	2	0
Total Authorised Departures	85	77	39	27	25	24	1
Water Supply Zones with Authorised Departures	54	48	30	25	23	21	1
Population covered by Authorised Departures ('000s)	1,516	1,369	842	834	851	840	17

Sources: NI Water, and DWI Drinking Water Quality Reports 2000 to 2008

additional £240 million to address this difference and the Independent Water Review Panel, which reported to the Department in October 2007, questioned *“whether the increasing investment required to effect further marginal improvements in drinking water quality represents good value for money”*.

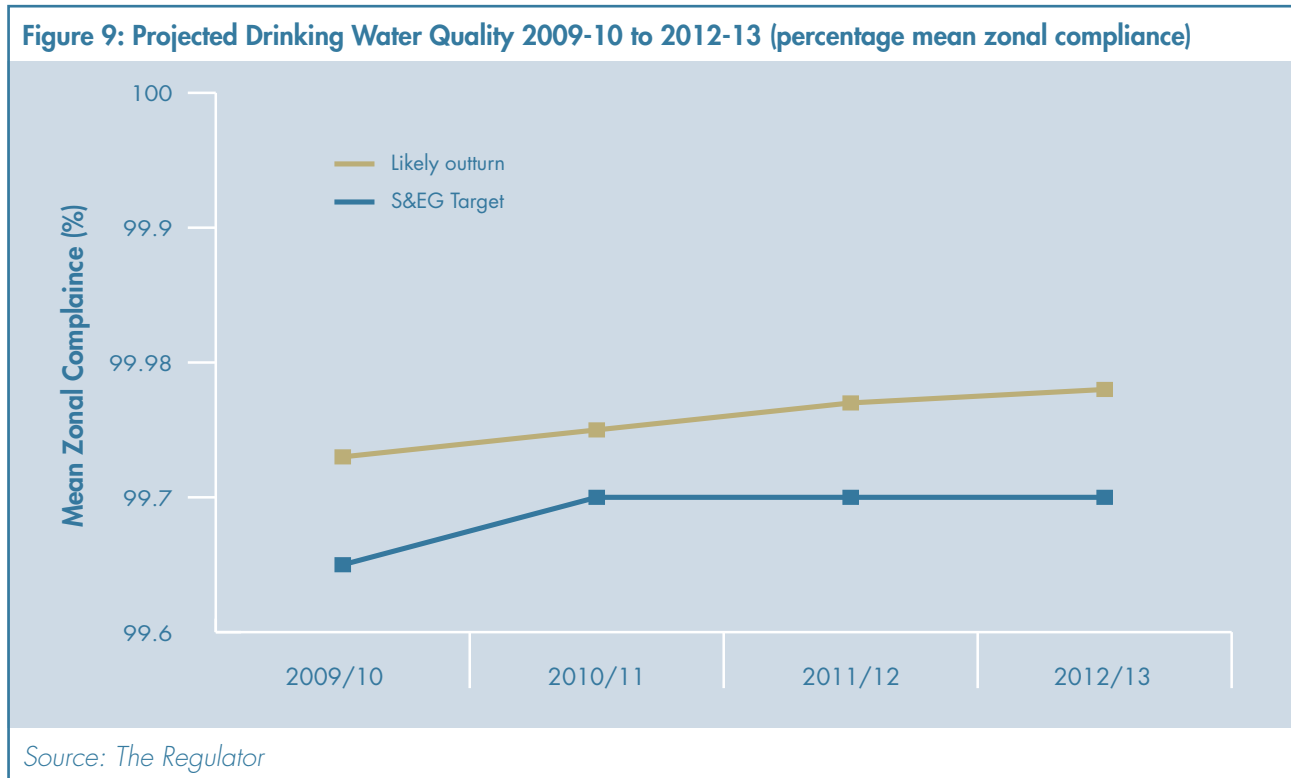
2.10 The Social and Environmental Guidance issued to the Regulator for the 2010-13 Price Control Review (PC10) stated that water infrastructure and treatment upgrades should be carried out to the extent necessary to maintain drinking water standards at 99.70 percent and this level has been included in the Final

Determination for PC10. Provisional results for 2009 indicate that compliance has already reached this level.

2.11 In the Final Determination for PC10, published in February 2010, the Regulator stated that drinking water in Northern Ireland is of a high quality, only slightly below that reported in England and Wales but that significant quality issues remain mostly but not exclusively related to THMs⁴. It also stated that based on the provisional outturn for 2009 and the level of on-going investment, it expected NI Water to exceed its provisional target for each year of PC10, with performance in the range shown in Figure 9.

4 The Final Determination Main Report published February 2010 Annex A : A6 Drinking Water Quality - based on Mean Zonal Compliance figures for 2007-08

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2.12 DWI in its report on 2008 water quality, published in October 2009, noted that ongoing investment will enhance THMs compliance but that other parameters – iron, lead, aluminium and manganese – require “significant improvement measures to be implemented to progress compliance”⁵. We asked DWI for an assessment of the risk to customers’ health in supply zones with high levels of THMs. They told us that “where compliance with THMs has still to be achieved DWI has granted authorised departures while infrastructure and remedial action is put in place. An authorised departure is only granted where there is not considered to be a significant risk to health. DWI seeks health advice from the Health Service”.

2.13 The Department told us that NI Water is not funded to achieve parity with companies in the rest of the UK and attempting to do so would represent poor value for money for the taxpayer and customer. The Department said compliance levels were already at the 99.7 percent level recommended in the Social and Environmental Guidance. It also pointed out that compliance can be affected by seasonal ‘raw’ water quality variations and is not solely dependent on investment.

2.14 Research carried out by the Consumer Council has recommended that “policy makers need to discover if consumers are willing to pay for the considerable investment needed to continue to improve

5 Drinking Water Quality in Northern Ireland published 2008. A report by the Drinking Water Inspectorate published October 2009

overall water quality standards"⁶. The Consumer Council reported that customers are generally satisfied with the quality of drinking water, but they are confused about the relationship between the taste, smell and appearance of water and its safety. It recommended that water quality information should be provided in an accessible and relevant way to address these issues and explain reasons for differences in water quality across Northern Ireland.

NI Water works with the Drinking Water Inspectorate to manage drinking water quality concerns

2.15 In addition to its regular sampling programme, NI Water must inform DWI of all 'events' occurring during its day-to-day operations that could impact on drinking water. Where, after investigation of the event, there has been a demonstrable deterioration in the quality of drinking water with the potential to impact on consumers' health, DWI categorises these as 'incidents'. The number of incidents has increased since 2003 with 29 reported in 2008; of these, 17 lasted less than a week, nine less than a month and three

incidents lasted for up to two months (see Figure 10). DWI told us that the increase in the number of incidents is partly due to improved reporting procedures in NI Water and better understanding of what constitutes an incident. All but three of the incidents in 2008, were within NI Water's control with 19 related to operational treatment difficulties, six caused by disinfection and one to inadequate adherence to operational practice during mains rehabilitation work.

- 2.16 In response to an incident, DWI may make recommendations for NI Water to address deficiencies, or it may take a range of enforcement actions to ensure that remedial measures are put in place to prevent any further breaches of regulations. The Health Service may also require NI Water to issue 'boil water advice notifications' where it considers there is or there may be a potential risk to consumers' health.
- 2.17 DWI has reported that in response to recommendations in 2007, NI Water has upgraded water treatment processes and reviewed operational practices where necessary. To reduce the risk of future events NI Water is putting Drinking Water Safety Plans⁷ in place for all water

Figure 10: Water Quality Incidents 2000 to 2008

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Events	13	7	7	5	6	14	18	28	41
Incidents	12	6	5	4	4	7	13	20	29
Boil Water Notices	10	5	6	5	4	1	7	0	4

Source: NIAO based on DWI data

⁶ Tapping into Consumer Views on Water: A Research Report by the Consumer Council commissioned by Northern Ireland Water published March 2009

⁷ Drinking Water Safety Plan risk assessments are incorporated in an amendment to the Water Supply (Water Quality) Regulations (NI) 2007

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treatment systems. These will be completed on a priority basis for all water treatment works and distribution systems by the end of 2010. A Case Study covering a boil water notice incident in 2009 is provided for illustrative purposes in the box below.

- 2.18 In 2007, DWI commenced enforcement procedures against NI Water for three Water Treatment Works which had exceeded the maximum THM level allowed under their Authorised Departures. Problems

at two of the Works have been addressed by upgrades under the Alpha Project and remedial measures at the third were to be completed by the end of 2009. In 2008, enforcement procedures commenced for four water treatment works to improve compliance for two THM, one aluminium and one iron contravention. While some actions have been completed, DWI will continue to monitor progress against NI Water's implementation plan.

Boil Water Incident at Dunore Point Water Treatment Works

Dunore Point Water Treatment Works is operated on behalf of NI Water by Dalraida WS Ltd under a Public Private Partnership contract. Dalraida contracts out the micro-biological and chemical analysis of drinking water samples to an external provider. On 13th April 2009, two water samples, taken on 12th April, tested positive for E-coli bacteria and 'coliforms' – a group of bacterial substances which may originate from faecal or environment contamination.

The external provider informed NI Water who notified the Health Service. The Consultant in Communicable Disease Control advised NI Water, that it should issue a Boil Water Notice as a precaution to all potentially affected customers. This requires that all water is boiled and cooled before drinking, and that boiled water should be used to prepare salads, fruit or vegetables that will not be cooked, and for the brushing of teeth or other direct use. The Consultant emphasised that *"the risk to public health is very low, but until the situation is resolved, the boil water advice should be followed"*.

The area affected by the boil water notice included 220,000 households covering some 500,000 people in the Belfast, Antrim, Ballymena, Randalstown and Ballyclare areas. A major incident team was established and arrangements made for the media to alert these customers the following morning in advance of a mail shot to provide further advice. Water supplies from Dunore Point were reduced and water supplies re-directed from other sources thereby reducing the number of properties potentially affected.

Following the satisfactory outcome of additional tests and evidence of good operating performance at the Works; the Consultant concluded that the initial sample results were unrepresentative and advised that the Boil Water Notice should be lifted a day later on the evening of 14th April. Again the media was used to advise customers that the Boil Water Notice was lifted. The mail shot was no longer required.

Following review of the incident, Drinking Water Inspectorate accepted that it was due to sampling error but confirmed this as a significant incident whereby a large population was potentially affected by the supply of water containing coliform bacteria and that these circumstances had the potential for negative impact on the public confidence in the water supply. It has reminded NI Water of the need to ensure that laboratories carrying out water quality testing on its behalf adhere to the prescribed standards for testing and the timely reporting of results. NI Water has transferred sample testing to its own accredited laboratories. It is also working with Dalraida to complete a Drinking Water Safety Plan for each of its treatment works.

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The quality of waste water discharges is regulated by the Northern Ireland Environment Agency

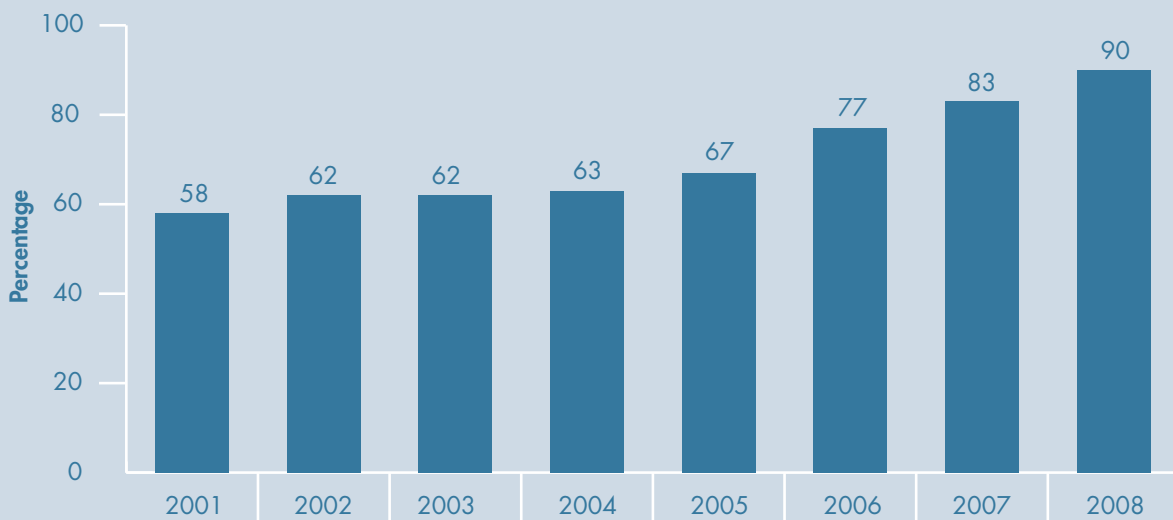
- 3.1 NI Water collects and treats some 350 million litres of waste water every day from 660,000 households and industrial premises connected to the sewer system. Discharge of this waste water back into rivers and coastal waters is a potential source of pollution, but waste water can be safely discharged, provided it is appropriately treated. NI Water's discharges are regulated through a system of consents administered by the Northern Ireland Environment Agency (NIEA). Consents are a form of licence, issued under the 1999 Water Order (Northern Ireland), which contain conditions relating to the quality and quantity of each discharge.
- 3.2 The EU Urban Waste Water Treatment Directive sets minimum standards for larger waste water treatment works serving communities with a population equivalent⁸ of more than 2,000 discharging to inland water and estuaries and more than 10,000 to coastal waters. It also requires that 'appropriate treatment' is set by the local regulator for works below this level. NIEA, as the local regulator, has set standards at the level which it considers necessary to protect the quality of the receiving water and in some cases these are more stringent than the European Standard.
- 3.3 In 2008, consents were in place for some 1,100 waste water treatment works and 300 sewer systems. Compliance with consent standards is assessed by NIEA using the monitoring data provided by

NI Water in agreement with an agreed sampling programme. NIEA periodically carries out audit checks on the processing of samples taken and the analytical procedures employed to ensure consistent and acceptable performance.

The quality of discharges from Waste Water Treatment Works has improved steadily in recent years

- 3.4 Historically, Water Service invested more in drinking water quality than in waste water treatment, resulting in relatively poor levels of compliance with discharge standards. Investment in waste water quality has increased in recent years with £485 million spent on waste water treatment works from 2000 to 2007. This has generated a steady improvement in waste water quality from 58 percent compliance with consent standards in 2001 to 90 percent in 2008 exceeding NI Water's 89 percent compliance target (see Figure 11).
- 3.5 The Final Determination for PC10 provides for approximately £200 million on an enhancement programme to improve waste water treatment works and sewers in the three year PC10 period. The Omega Project, a Public Private Partnership will deliver projects with a capital value of some £122 million. A new facility serving the Down / Newtownards area was completed in 2007 and further upgrades of six existing treatment works are planned. The Department of Environment in its 2007 report on the 'State of the Environment' indicated that the current level of expenditure would need to be maintained

8 Population equivalent is an Urban Waste Water Treatment Directive term used to measure the theoretical population served by the works, representing the total effluent load for both domestic and industrial effluent discharged to sewer. One population equivalent is equivalent to 60 grams of Biochemical Oxygen Demand per head per day.

Figure 11: Compliant Waste Water Treatment Works 2001 to 2008 (percentage of population equivalent)

Source: NIAO based on data from NI Water and NIEA

Notes: 1. This relates to compliance at 250 waste water treatment works with a population equivalent of over 250
 2. Percentage population equivalent is unavailable for 2001. The percentage here reflects the number of compliant works.

to achieve compliance with the Water Framework and other EU Directives⁹.

3.6 In 2005, the European Commission initiated infraction proceedings against the UK in the European Court for failure to comply with the EU Directive on discharges of waste water to the sea at 13 sites, nine of which were in Northern Ireland. In 2007, NI Water reported that improvements to waste water treatment works at these sites were completed and all now fully meet the EU treatment requirements.

The quality of NI Water's discharges is lower than the rest of the UK

3.7 NI Water recorded compliance of 90 percent in 2008. This compares to England and Wales where virtually 100 percent of the population equivalent is served by works which comply fully with discharge standards (see Figure 12). Scotland has had a similar 90 percent compliance level since 2006. NI Water has attributed this gap in performance to lower investment levels in Northern Ireland compared with the rest of the UK and intends that its investment programme to improve treatment will increase levels of compliance. The Regulator's Final Determination for PC10 includes investment by NI Water

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to complete ongoing improvements at 30 Waste Water Treatment Works and for a further 13 Works to be started.

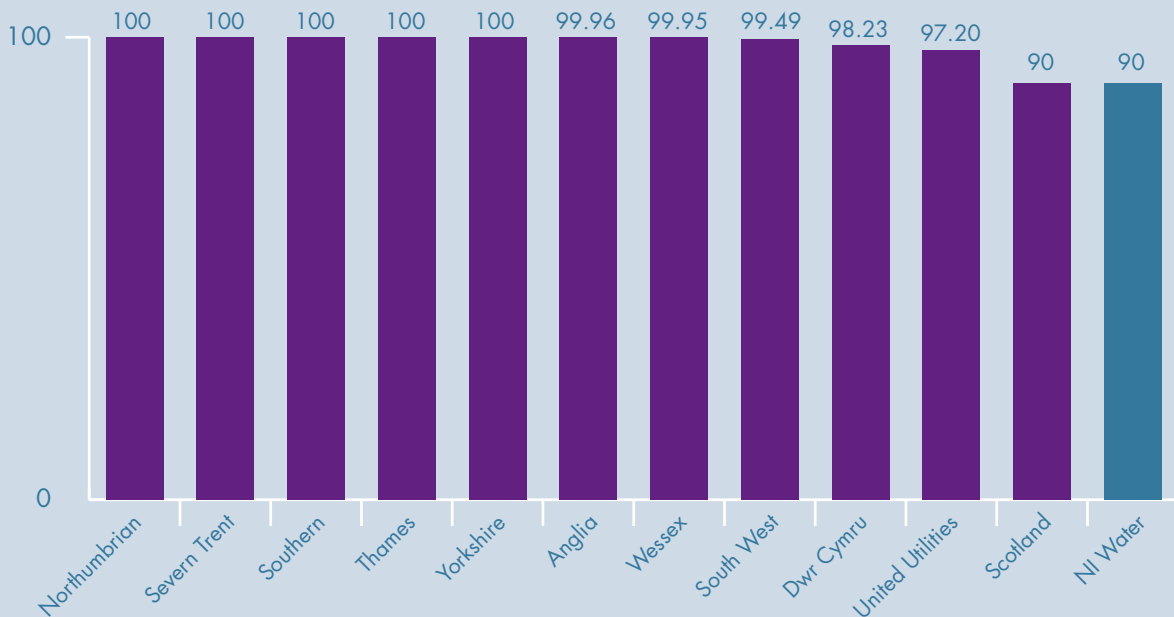
Reported compliance levels do not reflect the impact of interim standards

3.8 NIEA has issued Water Order Consents for some 250 large waste water treatment works serving population equivalents of more than 250. This covers around 98 percent of the total population equivalent in Northern Ireland. Some of these works, however, are not capable of meeting their consent standards and less stringent standards have been set on an interim basis until capital works to

upgrade treatment are completed and commissioned. Unlike the treatment of drinking water which takes no account of Authorised Departures from drinking water standards (see paragraphs 2.7 and 2.8), provided these waste water treatment works meet the lower standard, they are recorded as compliant. NIEA told us that this approach is used by the environmental regulators in the rest of the UK. In 2008 there were 27 works in this category and recording of these works as non-compliant would have reduced the compliance figure to 84 percent. It is intended that all works will be complete by 2015.

3.9 The Department is of the view that it is a standard regulatory practice across

Figure 12: Waste Water Compliance in the United Kingdom 2008 (percentage of population equivalent served by compliant works)



Sources: NIAO based on NI Water, OFWAT and Scottish Water data
 Note: Scotland based on 2007 data

the UK for discharges that meet interim standards to be considered compliant and that other water companies compliance figures may also be reduced if their interim discharge standards were to be recorded as non-compliant.

- 3.10 In addition to the larger works referred to above, consents are in place for over 800 small treatment works. Although these works cover only two percent of the total population equivalent, they have the potential to be locally polluting. Compliance at these works is not reported but around 300 have been identified by NIEA as 'unsatisfactory'. NI Water has set an annual budget of £5 million to improve small works based on a priority list agreed with NIEA. In 2008, NIEA issued 181 warning letters in respect of small works and in 2009, it introduced a risk based inspection programme, involving two inspections a year of some 250 works identified as problematic or in need of upgrade and replacement.

Intermittent discharges from sewer systems have not been fully assessed

- 3.11 Sewer systems in the UK are designed to accommodate both foul sewage and rainfall run-off from urban areas. During storm conditions, these 'combined sewer' systems may not have the capacity to accommodate all the flow received and overflows are provided to waterways, to avoid damage to the system or sewer flooding (see paragraphs 5.11 to 5.16). In addition to these combined sewer overflows (CSOs), pumping stations used to move waste water around the system, also have emergency overflows to protect equipment. NI Water has identified around 2,200 intermittent discharges including CSOs and emergency overflows at pumping stations and waste water treatment works.
- 3.12 The Urban Waste Water Treatment Directive requires that sewer systems are designed, constructed and maintained to reduce pollution by intermittent discharges. This is an area which has the potential for EU infraction proceedings and the European Commission is currently taking legal action against the UK due to the inadequacy of sewer systems in London and associated discharges to the Thames.
- 3.13 In 2000, the Assembly Public Accounts Committee (the Committee) criticised the lack of control over intermittent discharges in Northern Ireland and in response, the Department of the Environment gave an undertaking that all major installations including CSOs would be subject to regulation by 2005. The Committee emphasised that this was an important assurance on a realistic timetable, which they expected to be achieved. It is still not clear, however, to what extent a proper system of control exists in Northern Ireland whereby all discharges are identified, proper standards set, monitored and complied with.
- 3.14 NI Water and its predecessor Water Service has sought to identify CSOs through a series of Drainage Area Studies. To date NI Water has completed 90 out of 109 Drainage Areas identified. NIEA told us that it only knows about the standard of

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discharges where Drainage Area Studies have been carried out and will be unable to give a definitive assessment until all of them are completed. In October 2009, it had identified, from 57 studies reviewed, 386 unsatisfactory intermittent discharges (excluding emergency overflows) out of a total of 1,070 (36 percent), which is in contrast to the position in England and Wales where only 5 percent of CSOs are deemed unsatisfactory.

- 3.15 Following review of Drainage Area Studies, NIEA agrees action plans with NI Water and where capital works are required these should start within four years of the agreement of the plan. Drainage action plans have been agreed in principle for 21 sewage networks. Of these, three are complete and construction is ongoing in nine. This includes the Belfast Sewer Project which will result in the closure of a significant number of CSOs and is expected to reduce the pollutant load from the River Lagan and its tributaries by 85 percent. NIEA told us that in the absence of completed Drainage Area Studies, information is not available to inform investment decisions on sewer systems.
- 3.16 NI Water told us that because a high proportion of intermittent discharges are emergency overflows, it is important to recognise that these are designed to operate infrequently and only in circumstances of catastrophic failure. The Department questions the focus on monitoring intermittent discharges stating that the design and regulatory framework for them, which includes a significant number of emergency overflows, does not require NI Water to

provide constant monitoring across the whole network and that this is a standard regulatory practice throughout the UK. It also noted that NI Water continues to upgrade its records and the accuracy of its data on intermittent discharges. In its Social and Environmental Guidance to the Regulator on PC10, the Department has recognised that with investment generating improvements in waste water treatment, priority should now be given to reducing the risks of pollution from sewer networks.

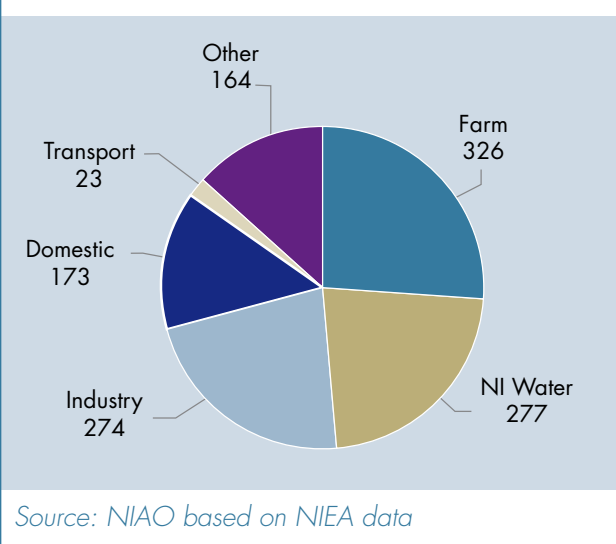
NI Water is responsible for nearly a quarter of all water pollution incidents in Northern Ireland and has been prosecuted for a number of more severe incidents

- 3.17 Water pollution takes two forms: 'diffuse' pollution such as that arising from agricultural run-off and more intense 'point source' pollution which is the cause of pollution incidents. Whilst diffuse pollution is regarded a major cause of reduced water quality, incidents caused by point sources are an indication of the most conspicuous and acute episodes of water pollution. Incidents are reported to NIEA, often by members of the public and where pollution is substantiated, NIEA classifies severity as low, medium or high, according to set criteria. For example, high severity incidents may cause extensive fish kills and require extensive remedial treatment, medium severity incidents may cause significant fish kills or contaminate the bed of a water course and low severity incidents may kill fewer than 10 fish or cause local contamination in a watercourse. Detailed criteria for the classification of incidents are at Appendix 4.

3.18 In 2008, NI Water was the second biggest source of water pollution incidents in Northern Ireland, responsible for 22 percent of the total of 1,237 incidents (See Figure 13). Since 2000, the number of water and sewage related incidents have ranged from 260 to 360 a year. A breakdown of pollution incidents attributed to the water industry in Northern Ireland is provided at Appendix 5. The Department told us that as NI Water is the single largest body discharging to inland and coastal waters the risk of pollution incidents is greater.

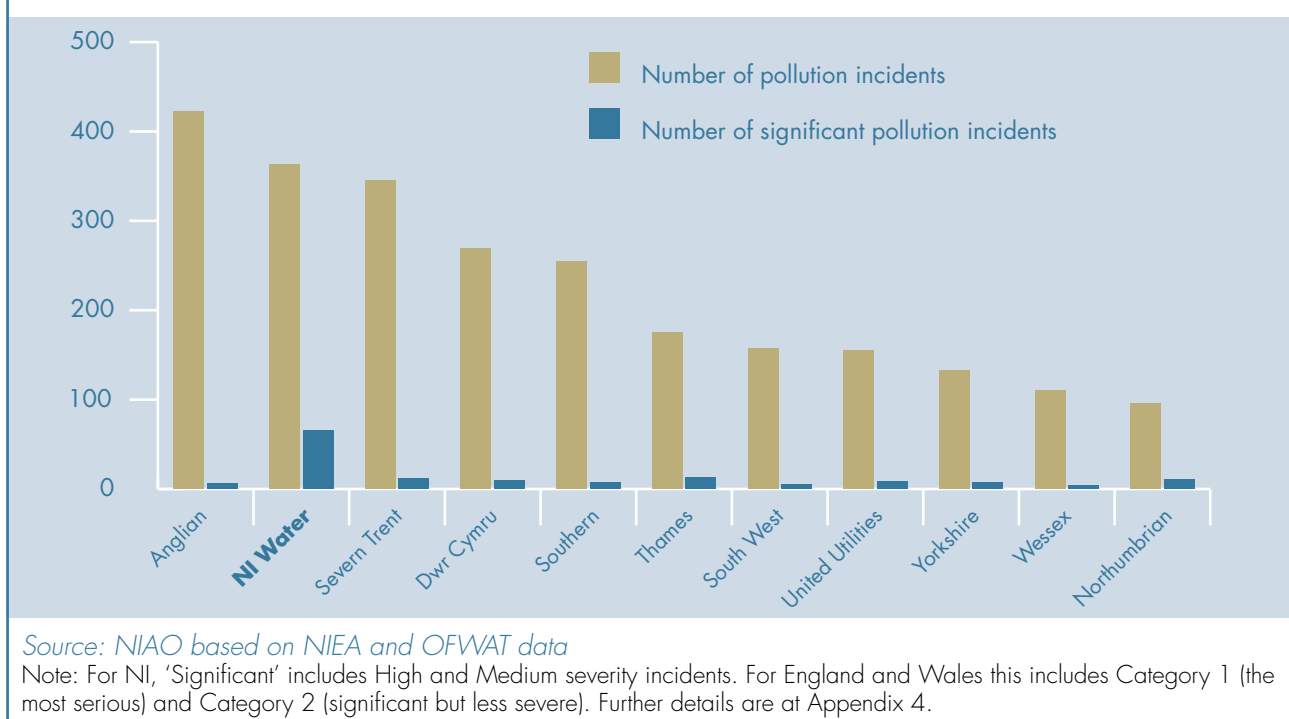
3.19 Compared to companies in England and Wales, NI Water has the second highest number of pollution incidents and its performance in terms of significant incidents is particularly poor with a total of 56 incidents in 2008. This is more than

Figure 13: Pollution Incidents by Source 2008



six times the England and Wales average (see Figure 14). The Department told us it has concerns about this comparison and

Figure 14: Significant Pollution Incidents 2008



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believes that further work is required to establish whether it is valid because NIEA uses a similar but not identical system for classifying pollution incidents to that in England and Wales. Details of the two pollution incident classification systems are at Appendix 4.

- 3.20 In 2008, over 80 percent of NI Water's pollution incidents were caused by either a blockage in the sewer system or failures at pumping stations and treatment works

(see Figure 15). Water Service, NI Water's predecessor, had crown immunity and could not be prosecuted for pollution incidents. Since April 2007, however, this restriction has been removed and NI Water has been successfully prosecuted six times with fines of £13,100. In 2008, NIEA considered enforcement action in connection with 46 pollution incidents and referred a further five cases to the Public Prosecution Service.

Figure 15: Cause of Pollution Incidents 2008

	Number	%
Blocked sewer	92	37
Waste Water Treatment Works failure	46	19
Sewer Pumping Station failure	41	17
Blocked CSO	21	8
Other	46	19
Total incidents (where cause is known)	286	100

Source: NIAO based on NI Water data

Pollution Incident : Crumlin River

On 1 April 2007, a discharge took place from the main Crumlin Sewage Pumping Station into the Crumlin River which resulted in a pollution incident. The station had two operational pumps, one on duty and one on standby. During the night there was a problem with the duty pump and the standby pump came on line to keep the station in operation. However, later in the morning the standby pump failed, resulting in an overspill of waste water from the Station into the river. On 7 May 2008, NI Water was fined £5,000 for pollution.

Following the incident, the standby pump was fully tested to determine why it had failed but no fault was detected. Although the standby pump had failed, no alarm signal was generated which would have alerted NI Water that there was a problem at the station.

Since then, NI Water has embarked on a major programme to enable better early warning of plant and other operational failures at sewerage pumping stations to reduce pollution and flooding incidents.

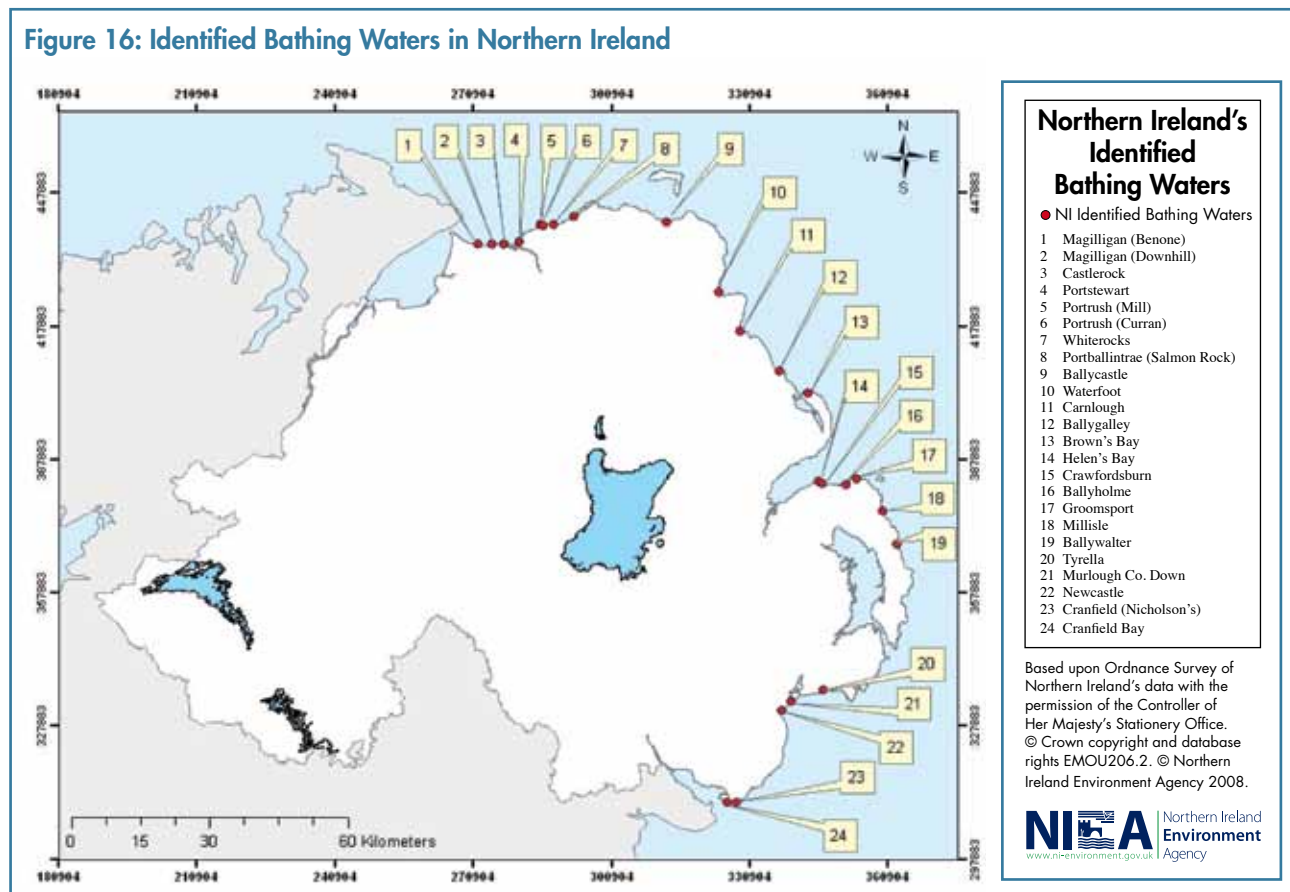
The quality of bathing water can be affected by NI Water's sewage discharges

3.21 The quality of bathing waters can be affected by discharges from water company assets, as well as other sources of pollution such as agricultural run-off. The EU Bathing Water Directives¹⁰ are intended to protect public health and the environment from faecal pollution at bathing waters. Member States are required to identify popular bathing areas

and to monitor water quality throughout the bathing season running from mid May to the end of September. NIEA is responsible for regulating bathing water quality in Northern Ireland and has identified 24 bathing water sites (see Figure 16).

3.22 The current Directive sets two standards for water quality:

- Mandatory - minimum standards which must be met; and



¹⁰ EU Bathing Water Directive 76/106/EC and EU Revised Bathing Water Directive 2006/7/EC. The revised Directive was transposed in national legislation under the Quality of Bathing Water (Northern Ireland) Regulations 2008 (SR. 2008 No. 231); the revised compliance monitoring begins 2012.

Part Three: Waste Water Quality

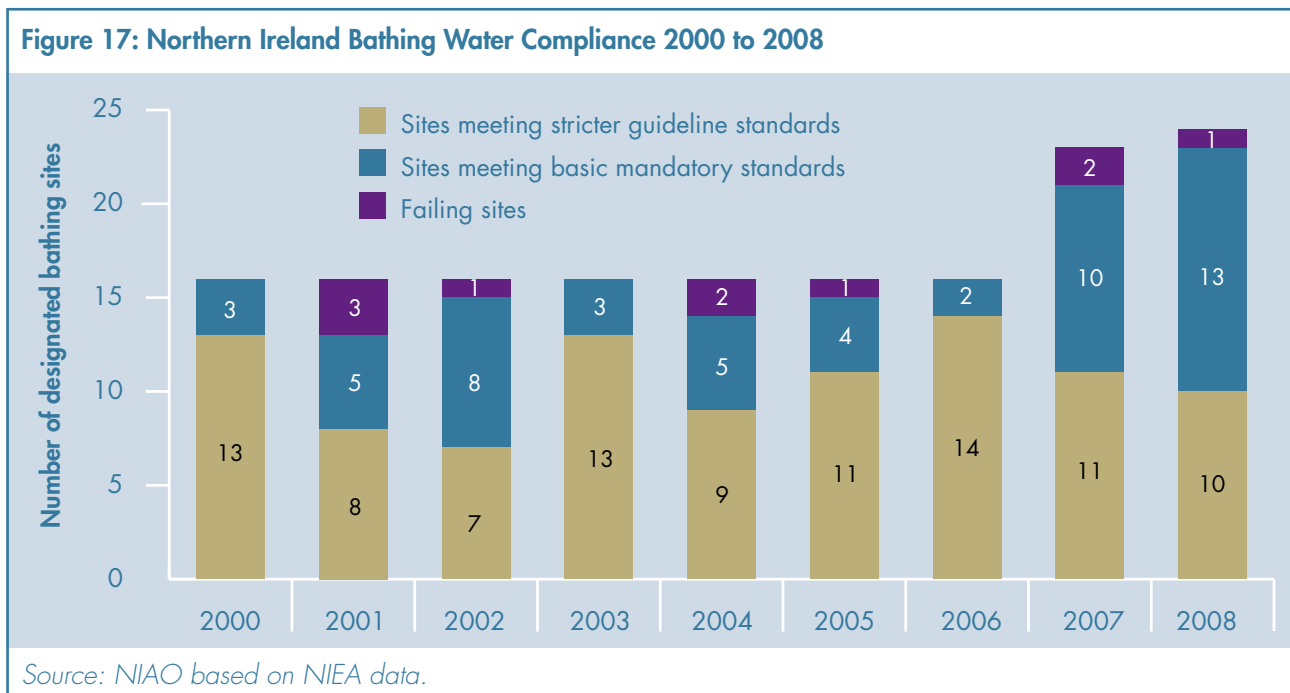
- Guideline - standards which indicate higher bathing water quality and are required for a beach to be awarded 'Blue Flag' status¹¹.

Bathing water quality in NI has fluctuated year on year. There have been some failures against mandatory standards in four of the last six years. This has been attributed to heavy rainfall which increases overflows from sewer networks and run-off from agricultural land. Compliance with higher guideline standards fell from 88 percent in 2006 to only 48 percent in 2007. This followed an increase in the number of identified sites from 16 to 23 and guideline compliance reduced again to a low of 42 percent in 2008 with the addition of a further site at Portbalintrae (see Figure 17).

3.23 The 'State of the Environment' Report indicated that NI bathing waters are showing improvements in compliance with microbiological pollution but that there are still periods where failures occur with minimum and higher standards due to localised events. It noted that ongoing investment in waste water treatment works will continue to protect and improve the quality of NI's bathing waters.

3.24 In 2007, two of the 23 bathing water sites - Newcastle and Ballyholme – failed to meet the minimum EU bathing standards because of waste water problems. The Ballyholme site also failed to meet the minimum standards in 2008 (see Case Studies below). Twelve bathing water sites (52 percent) failed to meet the higher standards in 2007, rising to 14 in 2008.

Figure 17: Northern Ireland Bathing Water Compliance 2000 to 2008



11 To achieve a 'Blue Flag' award, beaches must satisfy a total of 29 criteria including litter-free sands, safety and cleanliness in addition to guideline bathing water quality. 'Blue Flags' are only awarded for one season at a time. If some of the imperative criteria e.g. bathing water quality are not fulfilled during the season or the conditions change, the 'Blue Flag' status will be withdrawn.

Failure to meet these higher standards led to the loss of 'Blue Flag' status at Ballycastle in 2008. Ballycastle has minimal waste water treatment facilities and higher levels of waste water discharges during the summer bathing season. In 2009, 'Blue Flag' status was withdrawn from Portrush (West Strand) and Downhill, because of deteriorating water quality arising from heavy rainfall during the summer.

- 3.25 The Department considers that the lack of context with regard to bathing water compliance gives an unbalanced impression of NI Water's performance. It stated that bathing water compliance is not solely dependent upon NI Water and that

environmental factors, such as run-off from farmland, impact on bathing water quality. While quality fell (in terms of mandatory and guideline standards) between 2006 and 2007, it noted that this was largely due to the very wet summer of 2007 resulting in increased discharges from sewer systems, agricultural run-off, urban run-off and increased impact of river inputs. This weather pattern continued into 2008 and 2009. It commented that compliance in 2007 to 2009 has not improved, despite the completion of the North Coast Scheme and North Down Waste Water Treatment Works which demonstrates the impact of wet weather on bathing water quality and was reflected in the rest of the UK.

Bathing Water Sites which failed to meet minimum standards in 2007

Newcastle

The bathing water at Newcastle is directly affected by its proximity to the outfall from the Newcastle Waste Water Treatment Works (the Works). Also, poor bathing water quality periodically deteriorates when exceptionally heavy rainfall overwhelms the inadequate sewerage infrastructure in the town and limited storm water storage facilities at the Works.

The area around Newcastle is designated by NIEA as a sensitive area under the EU Standards. The Works at Newcastle is unable to provide the more stringent treatment level needed to meet the standards for sensitive areas until capital improvements have been put in place. The Newcastle Works is due to be upgraded by June 2013. Work on the sewerage system is under way and is currently scheduled for completion in 2011.

Ballyholme

The bathing water failure at Ballyholme in 2007 was most likely due to untreated sewage and storm water released to the sea in the vicinity of this bathing water site. New Works – covering the Bangor, Millisle, Groomsport and Donaghadee area were completed at the end of 2007 resulting in improved levels of treatment (including Ultra-violet disinfection of microbiological pollution) throughout the bathing season. Despite these improvements, Ballyholme failed to meet the mandatory standards in 2008. The sewerage network serving Ballyholme is to be upgraded; completion is scheduled for early 2010.

Part Four:
Leakage



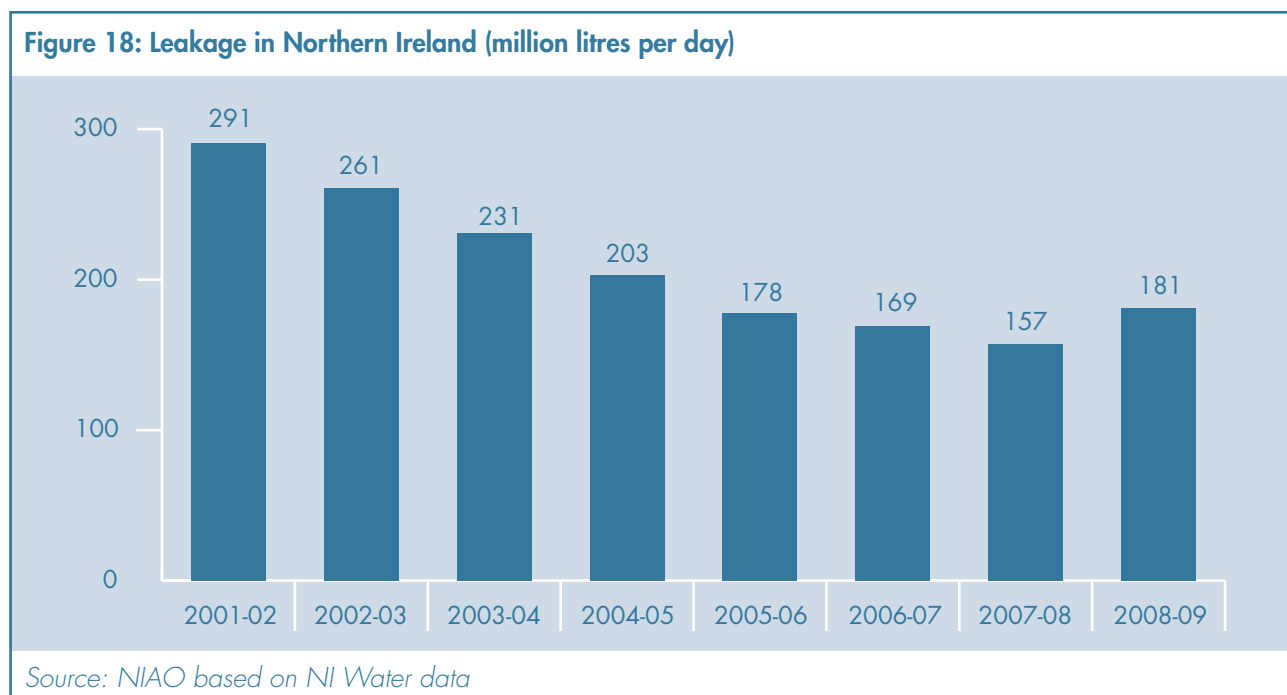
Part Four: Leakage

Leakage levels have reduced steadily since 2001-02

4.1 Water companies in the UK are required to balance supply and demand in a way which minimises the cost to the consumer and the environment. This includes the management of the amount of treated water which leaks from the system before it can be used. The importance of leakage reduction in maintaining supply became apparent following the 1995 drought in England and Wales where over 30 percent of the water put into supply in England and Wales was being lost through leakage. OFWAT set leakage reduction targets for the first time in 1997 and reported in 2007-08 that leakage had reduced by 36 percent compared to its peak in the mid nineties.

4.2 When the Assembly Public Accounts Committee¹² reported on leakage levels in Northern Ireland in 2002, Water Service was losing over 290 million litres of water a day – nearly 40 percent of treated water put into the distribution system. Since then, Water Service and latterly NI Water have reported substantial reductions in leakage to 157 million litres a day or 25 percent of distribution input in 2007-08 (see Figure 18). The Department has reported that this is costing the taxpayer £5 million a year¹³. Based on this level of leakage, NI Water had set targets to reduce leakage to 135.5 million litres by 2015.

4.3 In 2007-08, the independent Reporter appointed by the Regulator challenged the quality of data and the methodologies used by NI Water to measure leakage



12 *Water Service: Leakage Management and Water Efficiency*; 9th Report Public Accounts Committee Session 2001-02

13 Written Answers 13 March 2009, Minister for Regional Development AQW 5735/09

and in response NI Water undertook a detailed review. Subsequent changes to methodologies and improvements in data resulted in an increase in the reported level of leakage to 181 million litres a day compared to the target of 146 million. NI Water stated that information on past leakage reduction remains valid and the increase in reported leakage does not mean that additional water is being lost. NI Water told us that the rebased figure reflects an improving confidence in the real level of leakage which will provide for more robust leakage targets in the future (see Figure 18).

NI Water has a two year action plan to improve the accuracy of the leakage estimate

4.4 Whereas the volume of water put into supply can be measured directly, leakage must be estimated and is difficult to calculate accurately. There are two main methodologies for estimating leakage: the

water balance method and the minimum night flow method.

4.5 The water balance or 'top down' method measures the amount of water put into the distribution system and the amount used by metered customers. Other components of usage are estimated and the balancing figure is leakage. In 2007-08 this figure was calculated as:

The minimum night flow method measures flows of water into district metered areas of around 800 properties at night when consumption is at a minimum and after deducting an allowance for use by customers, any remaining flow is regarded as leakage.

4.6 Because so many elements of the water balance are estimated, OFWAT best practice requires companies to undertake both calculations and reconcile the figures. Where the difference is less than five percent of distribution input, companies are allowed to reapportion

	Million litres per day	Million litres per day
Water put into supply		
<i>Less</i>		614.45
Use by metered customers	132.37	
Estimated use by unmetered customers	314.32	
Estimated operational use	4.39	
Estimated water taken unbilled	24.32	(475.40)
Distribution system leakage		139.05
<i>Add</i> estimated supply pipe leakage		45.14
Total leakage		184.19

Part Four: Leakage

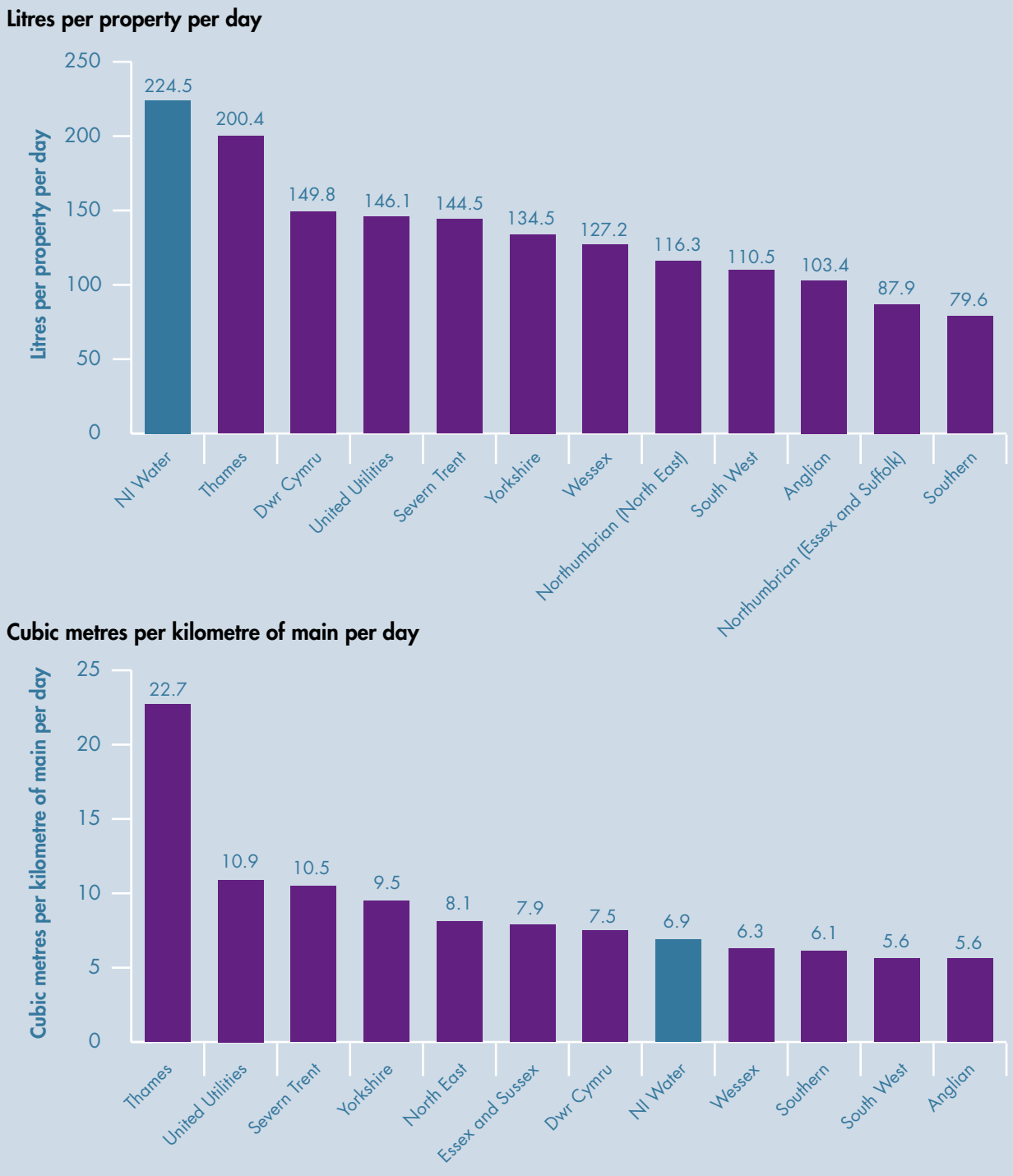
it across all the elements of the water balance to derive an adjusted leakage figure. Where the difference is more than five per cent, OFWAT requires companies to record the entire imbalance as leakage and to explain what action is being taken to improve the estimate.

- 4.7 In 2007-08, NI Water recorded a water balance figure of 184 million litres per day (Mld) and a night flow figure of 152 Mld giving an imbalance of 32 Mld. This was 5.17 percent of distribution input and marginally in excess of the five percent threshold. Applying the OFWAT approach, NI Water would have been required to record leakage as 184 Mld. On this basis, it would have exceeded its target of 157 Mld. However, NI Water, with the approval of the Regulator, opted to reappportion the balance to the night flow figure, giving a final leakage figure of 156 Mld, marginally below the target.
- 4.8 This was on the understanding that NI Water carry out a review of the water balance methodology and it is currently half way through a two year action plan to improve the accuracy of leakage measurement. Reporting on the information provided to the Regulator for 2008-09, the independent Reporter stated that the water balance was more robust than in previous years but should still be regarded as an interim assessment. Many of the changes made during 2008-09 require a full twelve months data to be fully effective and the calculation of the water balance would not be fully in line with best practice until 2009-10.

The Economic Level of Leakage is the best measure of leakage reduction performance

- 4.9 OFWAT reports the leakage performance of water companies using two measures: litres per property per day and cubic metres per kilometre of main per day. Using these measures to compare NI Water's performance with other water companies gives two very different results (see Figure 19). The first measure shows NI Water with a comparatively high level of leakage. This is because of the relatively low number of connected properties per kilometre of main in Northern Ireland. In contrast the second measure shows a comparatively low level because of the greater length of water mains in Northern Ireland. Whilst these measures may help to explain some differences in leakage levels, they are of limited use in assessing company performance. The key measure of performance is NI Water's ability to reduce leakage to targets based on a properly calculated Economic Level of Leakage.
- 4.10 The Department does not agree that the disparity in results between the two measures of leakage means they are of limited use in assessing company performance. The Department told us that NI Water had a more rural catchment area compared to other UK water companies. NI Water's distribution system has on average twice as many linear metres of water main per property compared to companies in England and Wales. Since leakage is ultimately a factor of the length and condition of pipes, rather than the number of properties served, measuring leakage per kilometre of main effectively

Figure 19: Comparison of leakage levels 2008-09



Source: NIAO based on NI Water and OFWAT data

Part Four: Leakage

normalises rates and allows for a more accurate, direct comparison.

- 4.11 High levels of leakage can affect a company's ability to supply water and also represents a loss of money spent on treating water and delivering it to where it is needed. Eliminating leakage completely, however, would be virtually impossible and given that there is a cost involved in finding and fixing leaks, it would also be prohibitively expensive. OFWAT has developed an approach to leakage management whereby companies are required to reduce leakage to the level at which it would cost more to make further reductions than to produce water from another source. This is known as the Economic Level of Leakage (ELL). Operating at this level means that the cost of supplying water is minimised and the company is operating efficiently.
- 4.12 The economics of supply and demand are different for each company and this leads to differing ELLs. Rather than a comparison with other companies therefore, the main measure of a company's leakage performance is the extent to which it has achieved target reductions based on a soundly calculated ELL.

The current Economic Level of Leakage does not provide a sufficiently robust basis for performance measurement

- 4.13 NI Water calculated an ELL of 135.5 Mld in 2006 and targets were set to achieve it by 2010. Reductions in the level of leakage achieved up to 2007-08 indicated that satisfactory progress was being made towards this target. With the increased estimate of leakage in 2008-09, however, this ELL is no longer valid and NI Water has set a new PC10 target of reducing leakage to 166 Mld by 2013. The Reporter has stated that current estimates of leakage are not sufficiently robust to support regulatory target setting but do provide an appropriate basis for short term targets until more robust data is available. Targets based on 2008-09 figures are likely to change in future years.
- 4.14 The current target level is based on a revised 'short-run ELL'¹⁴ which does not take account of the cost of future capital spend on new sources which could be deferred by reducing leakage further. The calculation of the 'long-run' ELL will progress with the Water Resources Management Plan which is expected in 2011.
- 4.15 Leakage increases the amount of water that needs to be put into supply which can be damaging to the environment by increasing water abstraction or the need for new reservoirs. In its 2002 report on Leakage and Water Efficiency in England and Wales, the Westminster Public Accounts Committee recommended that in setting leakage reduction targets, companies should take account of the environmental costs of increasing water supply and by 2004, all water companies had included some element of environmental costs in their ELL calculation which tended to further reduce ELLs.
- 4.16 Since then OFWAT has placed increasing emphasis on the *Sustainable Economic*

14 NI Water estimates the short-run ELL at 175 Mld, but recognising the uncertainties in the current analysis, has suggested that the ELL could be in a range between 160 and 192 Mld.

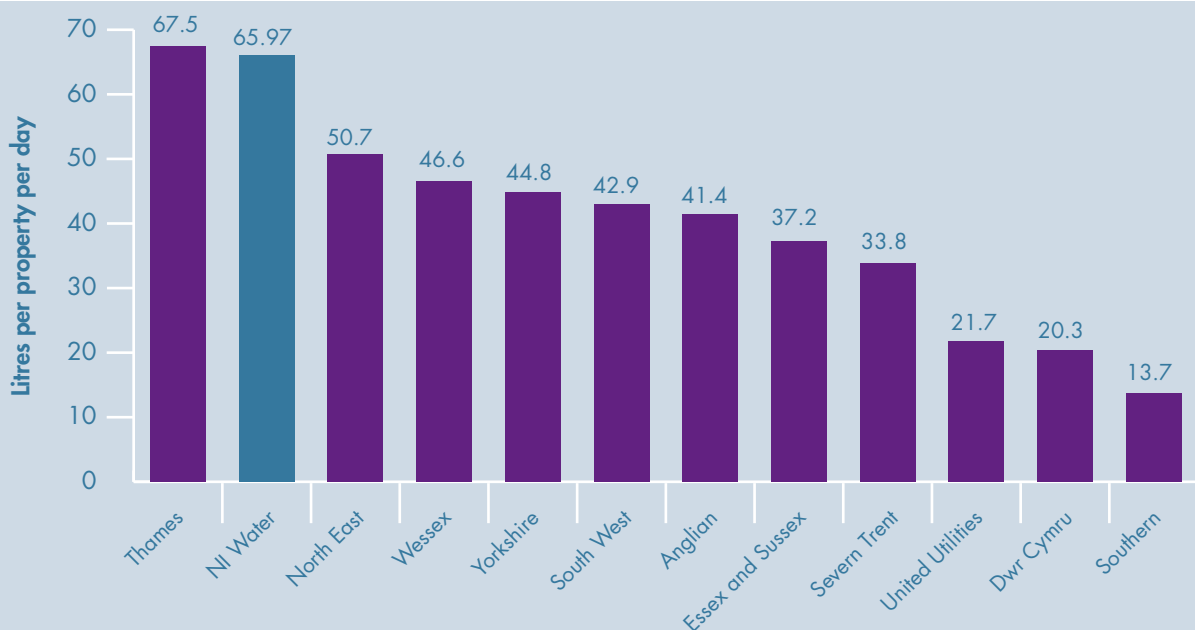
Level of Leakage (SELL) as the basis for leakage reduction targets and in 2008, it issued detailed guidance for inclusion of the “full range of environmental, social and carbon related impacts” in SELL calculations for its 2009 Price Review. This approach is intended to ensure that targets are set at a level that is optimal for customers and broader society. To date NI Water has not included environmental or social costs in its ELL calculation but told us that both costs and benefits would be included in the Water Resource Plan and the future ELL assessments. The Regulator confirmed in the Final Determination for PC10, that NI Water is to develop a sustainable ‘long-term’ level of leakage target for the next Price Review, taking account of capital replacement costs and wider economic

costs, including the cost of carbon and environmental impact.

With more than a quarter of leakage occurring on customers’ properties, free supply pipe repair could make an effective contribution to reducing leakage

4.17 Leakage is made up of two components: losses on the distribution system between the treatment works and the customer’s property; and losses on the ‘supply pipe’ on the customer’s property. NI Water’s revised estimates indicate that supply pipe leakage accounts for 27 percent of total losses and Northern Ireland has a comparatively high level of supply pipe leakage per property (see Figure 20). This

Figure 20: Supply Pipe Leakage 2008-09 (litres per property per day)



Source: NIAO based on NI Water data

Part Four: Leakage

has been attributed to high flow rates, longer supply pipes and much longer repair times.

- 4.18 Longer repair times compared with England and Wales, are due to a difference in repair policy. OFWAT expects all water companies in England and Wales to provide free or subsidised supply pipe leak detection and repair as part of its water efficiency programme. In Northern Ireland, however, the customer must pay for repairs to supply pipes. Where a leak is detected on a supply pipe, a notice is issued requiring the customer to carry out a repair. Where this is not done within the required time, NI Water may carry out the repair and charge the customer. This results in leaks running for longer in Northern Ireland. Free or subsidised repair would be economically viable if the cost of repair to NI Water was less than the cost of producing the water saved by repairing the leak earlier.
- 4.19 In its 2002 Report, the Assembly Public Accounts Committee recommended that the then Water Service review the economic justification of free or subsidised repair in Northern Ireland. Water Service carried out a review but concluded that free repair was not justified at that time. We note that on the basis of revised leakage estimates the Reporter has recommended that the Regulator in conjunction with NI Water reconsider the economic case for implementing a free or subsidised repair policy to reduce this component of leakage.

- 4.20 The Department stated that *“free supply pipe repair is misleading. It costs money to fix supply pipes. In Northern Ireland, public responsibility moves to private responsibility at the edge of private property. Consumers here are responsible for the cost of repairs to their supply pipes as is generally the case in England. In current funding circumstances the cost of these proposals would fall largely upon the Executive’s budget reducing the funding available for other public services. Complex policy proposals of this nature require careful analysis”*. The Department also stated that *“supply pipe leakage is not especially problematic in Northern Ireland as the report implies. It represents 27 percent of total leakage here versus 24 percent on average in England and Wales. There are more cost effective ways of achieving the Economic Level of Leakage than subsidised supply pipe repairs”*.

Part Five:
Customer Service



Part Five: Customer Service

OFWAT has defined minimum standards of customer service

5.1 The GB water industry operates a Guaranteed Standards Scheme which defines minimum standards of service which each company must provide to consumers. Standards have been set for:

- water pressure
- interruptions to supply
- sewer flooding; and
- customer contact.

With the deferral of domestic charging a similar scheme planned for Northern Ireland in 2009-10 has not been implemented and is not anticipated in the near future. The Regulator is currently working on cross utility research in order to establish guaranteed minimum standards for the water, gas and electricity industries in Northern Ireland.

Low water pressure affects more properties in Northern Ireland than other parts of the UK

5.2 Companies are required to provide water at a pressure which will, under normal circumstances, allow it to reach the top floor of a house. In practice, companies report against a reference level of 15 metres head of pressure in the distribution main supplying the property. NI Water compiled a register of properties at risk of inadequate pressure for the first time in 2007-08 when more than 10,000

properties were identified. At 1.29 percent of the properties served by NI Water, this is a significantly higher failure rate than other UK water companies. At that time, data on pressure was available for only a third of the water network; assessment of the remaining two thirds was based on estimates of pressure which identified properties potentially falling below the minimum standard. Although the Regulator considered that this analysis was comprehensive, it noted that the figure remained an estimate and that NI Water needed to undertake further work which had the potential to change the estimated figure substantially.

5.3 NI Water told us that during 2008-09 improved data identified properties previously classified as 'at risk' which were in fact adequately served. A number of additional properties at risk were also identified. The net effect of this was to reduce the number of properties at risk to 5,770 or 0.72 percent of properties served (see Figure 21). OFWAT classifies performance against customer service standards as 'good', 'acceptable' or 'needs improvement'. Applying this approach NI Water's performance on water pressure would be rated as 'needs improvement'. OFWAT may take regulatory action in these cases.

5.4 In responding to the 2007-08 figures, the Regulator said that it expected NI Water to improve the accuracy of this assessment to provide the basis for meaningful targets and development plans for improved service in this area. The Consumer Council¹⁵ has also recommended that NI

15 Tapping into Consumer Views on Water: A Research Report by the Consumer Council commissioned by Northern Ireland Water published March 2009.

Water define clear targets and strategies to reduce the number of properties experiencing low pressure. The Department pointed out that the Consumer Council's research showed that pressure was the lowest customer concern and significantly less important than safety, discoloration, leakage and supply interruptions. NI Water told us that ongoing data validation is likely to remove more properties from the register and this work will continue into the 2009-10 period. The Regulator understands that this validation work is likely to result in a further significant reduction in the number of properties in the register 2009-10 and that completion of this work along with planned investment is likely to result in NI Water

performance being rated as 'acceptable' based on the OFWAT criteria. Low water pressure is one of the main drivers of NI Water's Mains Rehabilitation Programme which is currently spending in the region of £30 million per year. This will help to remove genuine cases of low pressure from the register.

Unplanned supply interruptions have reduced but there is scope for further improvement

5.5 Unplanned interruptions to supply are inconvenient for consumers and, where these occur, it is normally due to a mains

Figure 21: Properties with inadequate water pressure 2008-09

Company	Number of properties below reference level	Percentage of properties below reference level	Performance assessment
NI Water	5,770	0.72	Needs Improvement
Scotland ¹	5,907	0.24	Acceptable
Severn Trent	4,147	0.12	Acceptable
Anglian	517	0.03	Good
Southern	315	0.03	Good
Wessex	150	0.03	Good
Northumbrian	311	0.02	Good
South West	188	0.02	Good
Dwr Cymru	197	0.01	Good
United Utilities	272	0.01	Good
Thames	34	0	Good
Yorkshire	86	0	Good

Source: NIAO based on NI Water, Scotland and OFWAT data

Note: 1 Scotland data based on 2007-08

Part Five: Customer Service

burst or equipment failure. Performance measures in this area record the percentage of properties experiencing unplanned interruptions longer than 6, 12 and 24 hours. Since 2000-01 the overall number of properties in Northern Ireland with supply interruptions lasting more than 6 hours has reduced by 65 percent from some 23,000 to just over 8,000 in 2008-09. NI Water's scores in 2008-09 record the weakest performance in

the UK but would be rated by OFWAT as 'acceptable'.

5.6 Despite the overall reduction, interruptions of more than 12 hours have fluctuated greatly and in 2008-09, 609 properties had interruptions lasting more than 24 hours, far exceeding the target of 80 properties. At 0.08 percent this is a very small proportion of the Northern Ireland total, however, this is a considerable loss of service for the

Figure 22: Unplanned interruptions to supply 2008-09

Company	Percentage of properties with interruptions			Performance score ¹	Performance Assessment
	over 6 hours	over 12 hours	over 24 hours		
NI Water ²	1.016	0.25	0.076	1.42	Acceptable
Severn Trent	0.61	0.10	0.01	0.73	Acceptable
Northumbrian	0.60	0.16	0	0.76	Acceptable
United Utilities	0.52	0.03	0	0.55	Acceptable
South West	0.38	0.15	0.03	0.59	Acceptable
Thames	0.36	0.04	0	0.40	Good
Scotland ³	0.31	0.06	0.03	0.43	Good
Southern	0.25	0	0	0.26	Good
Anglian	0.21	0.10	0	0.31	Good
Wessex	0.19	0	0	0.19	Good
Yorkshire	0.19	0.05	0	0.24	Good
Dwr Cymru	0.07	0.03	0	0.10	Good

Source: NIAO based on NI Water, OFWAT and WICS data

Note 1 Performance score = (>6hrs X 1) + (>12hrs x 1) + (>24hrs x 2)

2 For comparability with GB Water companies, NI Water has adjusted previously reported figures to exclude interruptions caused by third parties and overruns in planned interruptions. Unadjusted figures reported in the 2008-09 Annual Report were as follows: > 6 hours - 1.094 percent, > 12 hours - 0.259 percent, > 24 hours - 0.077 percent giving a performance score of 1.507%.

3 Scotland data based on 2007-08

properties affected and most UK companies have recorded no interruptions of more than 24 hours for a number of years (see Figure 22). NI Water has attributed this to a small though significant number of incidents involving higher than average numbers of properties and supply restoration times; this included two incidents affecting supplies to 135 and 200 properties both lasting just over two days, and one incident which left 197 properties without supply for just over one day.

5.7 The Department told us that Northern Ireland's water distribution network has, on average, twice as many linear metres of water main per property compared to England and Wales. Therefore, whilst NI Water burst rates (per unit length of water main) are comparable with those in England and Wales, the number of interruptions per connected property appear much higher for NI Water. Also, because Northern Ireland is predominantly rural, with a more dispersed population than England and Wales, a similar incidence of burst mains could lead to a greater number of properties experiencing supply interruptions for a longer duration. This is because in rural areas there is less scope to mitigate supply interruptions compared to urban areas where 'rezoning' is possible. Bursts also take longer to locate and repair in rural areas.

5.8 In its Final Determination for PC10, the Regulator recognised the relationship between length of main, burst frequency and interruptions. It concluded that it may

not be possible for NI Water to make significant reductions in interruptions to supply without reducing the frequency of mains bursts well below levels experienced in GB. The Regulator expects NI Water to consider the interaction between length of main per property, burst rate and interruption to supply when developing its plans for the next Price Review to demonstrate the link between investment and improvements in service.

5.9 The Consumer Council¹⁶ noted that *"interruptions of longer than 12 hours were more likely to be viewed as an important priority" adding that "participants acknowledged that any interruption to supply was preferably avoidable and when it did happen it caused inconvenience; inconvenience that increased as the duration of the interruption increased"*.

5.10 As with water pressure, the Mains Rehabilitation Programme is intended to improve performance on supply interruptions. The Regulator has advised that NI Water has been set targets in the Final Determination for PC10 to improve performance by 2012-13 based on the following:

- > 6 hours 0.94 percent of properties
- > 12 hours 0.205 percent of properties
- > 24 hours 0.01 percent of properties

16 Tapping into Consumer Views on Water: A Research Report by the Consumer Council commissioned by Northern Ireland Water published March 2009.

Part Five: Customer Service

NI Water is not yet able to accurately measure its performance in preventing flooding from sewers

- 5.11 Sewer flooding occurs when sewage escapes from the sewer system through a manhole, drain or toilet. This can be caused by a blockage in the sewer, because the sewer is not big enough to accommodate the amount of waste water flowing into it, or because of severe rainfall. It has long been recognised in the industry that internal sewer flooding is one of the worst service failures that a customer can experience and the Consumer Council's 2008 research indicated prevention of sewer flooding as customers' overwhelming priority for future investment in the sewage system.
- 5.12 Water companies in the UK are required to assess the number of properties at risk of flooding once in ten years and twice or more in ten years. Investment in England and Wales since 1990 has significantly reduced the number of properties at risk. They also report the cause of flooding incidents in two categories: overloaded sewers (excluding severe weather conditions¹⁷); and other causes, such as blocked sewers, collapsed sewers or equipment failures.
- 5.13 Because it was not a regulatory requirement before April 2007, NI Water, compiled this information for the first time in 2007-08. The Regulator judged, however, that the information was not robust enough to allow a comparison of performance with other UK companies. The Regulator has reported that it expects NI Water to improve its record management and investigation systems to significantly improve the robustness of the figures produced for the 2009 Information Return. It is intended that this will provide the basis for meaningful targets and improvements in service to those customers affected by sewer flooding. NI Water is continuing to develop its sewer register and this will be a determinant for the focus of future capital expenditure. Whilst its 2008-09 Annual Report did not have targets in place nor measure performance; NI Water reported to the Regulator¹⁸ 26 properties affected by internal sewer flooding and just under 10,000 areas flooded externally in year.
- 5.14 The Regulator told us that it has serious concerns about the robustness of this data and the confidence grade applied to it. The number of properties reported is drastically lower than that reported in 2007-08. It further stated that poor data limits the ability of NI Water to identify and prioritise investment to alleviate sewer flooding. It calls into question comparisons between NI Water and other companies in GB. The Regulator intends to work with NI Water in its efforts to improve the quality of reported flooding data and to monitor NI Water's progress in this key area.
- 5.15 The Consumer Council reported a NI Water estimate of 0.08 percent of properties in Northern Ireland experiencing internal sewer flooding as opposed to 0.03 percent in England and Wales. Of the sample of consumers surveyed by the Consumer Council, three percent reported that they had been affected.
- 5.16 A Case Study covering a sewer flooding incident is provided for illustrative purposes in the box opposite.

17 Severe weather conditions are defined as a rainfall event which would not happen more often than once in twenty years.

18 Annual Information Report 09 to the Regulator

Sewer Flooding Incident: Lower Ormeau October 2009

On 9th October 2009 residents at River Terrace and Cooke Street in Belfast's Lower Ormeau were affected by an out-of-sewer flooding incident. The Lower Ormeau area is known to be at risk of sewer flooding and the River Terrace pumping station is designed to come into operation automatically during periods of heavy rainfall. Storm water is discharged through a Combined Sewer Overflow (CSO) to the River Lagan. However, if the levels in the River Lagan are high such as at high tide, the CSO's outlet point becomes submerged and discharge of storm water is not possible because the outlet valve may not be opened.

NI Water carried out its daily inspection of the pumping station at 9 am on 9th October. However, following a heavy rainstorm in the afternoon, 37 calls were received reporting flooding in the area. High tide in the River Lagan was at 3.15 pm and the level did not fall sufficiently to allow the CSO gravity outlet valve to operate until 5 pm. As a result, all four pumps were overwhelmed and the system of CSOs backed up. Subsequent review showed that the pumps had started as required 25 minutes before high tide; but that one pump became blocked with 'rag' material and stopped working. The flooding in the area subsided following opening of the CSO valve becoming operational. On this occasion, NI Water confirmed that one property experienced internal sewer flooding. NI Water recognises the need to increase public awareness to the risk of out-of-sewer flooding from blockages as a consequence of flushing unsuitable material into the sewer system.

The new Belfast Sewer Tunnel came into service on 14 December 2009. This is designed to cope with much more severe weather and storm overflows now go directly to the Tunnel avoiding the need for pumping or discharge to the river. This will greatly reduce the likelihood of sewer flooding in the area. In the period between the incident and the commissioning of the Tunnel, NI Water posted four staff at the pumping station two hours either side of high tide when rain was forecast to ensure that all pumps were available. On two occasions, the team successfully unblocked a pump, thereby reducing the flooding risk.

Most customer contact targets are being met and NI Water is moving towards the average UK performance

- 5.17 The quality of water companies' customer contact functions are measured using a range of indicators covering billing, written complaints, meter reading and ease of telephone contact (see Figure 23).

Billing contacts

NI Water marginally missed its target for billing contacts in 2007-08 and recorded a lower score than all but two companies in England and Wales. Using the OFWAT approach this performance would be rated as 'needs improvement'. This is despite operating with a very low number of billed customers compared with other companies. In 2008-09, NI Water improved its

Part Five: Customer Service

performance exceeding its target and raising its standard using the OFWAT approach to 'good'.

Written complaints

NI Water did not achieve its target for written complaints in 2007-08 and recorded a lower score than all but one company in England and Wales. In 2008-09, whilst recording the lowest score, NI Water made significant improvement in performance and exceeded its target;

using the OFWAT approach, NI Water's performance has risen from 'needs improvement' to 'acceptable'.

Bills for metered customers

Whilst NI Water missed its target by a wide margin in 2007-08, significant improvement was achieved in 2008-09; however, it still missed its target and recorded a lower score than any company in England and Wales. OFWAT would rate this performance as 'needs improvement'.

Figure 23: NI Water customer contact performance 2007-08 and 2008-09

	2007-08			2008-09		
	E&W average	Target	Actual	E&W average	Target	Actual
Billing contacts - percentage answered within five working days	97.3	96.0	95.0	98.9	97	98.6
Written complaints - percentage answered within ten days	93.2	96.0	90.5	99.6	97	97.6
Metered customers - percentage receiving at least one bill based on a meter reading	99.7	95.0	71.8	99.8	95	93.3
Telephone calls - percentage answered during business hours, within 30 seconds	N/A	93.0	94.8	N/A	95	97.09
Calls received	2266		322	2284		322
Percentage of calls abandoned	7.6	N/A	1.1	7.0	1.0	1.12
Percentage of all lines busy	3.2	N/A	0.0	0.4	1.0	0.0
Call handling satisfaction score (maximum of 5)	4.6	N/A	4.2	4.6	4.35	4.4

Source: NIAO based on NI Water and OFWAT data

Telephone contact

NI Water exceeded its targets for all telephone contact measures in 2008-09. It is not possible to benchmark this performance for the calls 'answered in 30 seconds' measure because OFWAT no longer uses this performance measure. However, NI Water submitted additional information to the Regulator for 2007-08 and 2008-09 which shows a better than average performance against two of the three OFWAT indicators for each year.

- 5.18 The Department stated that one of the main drivers for water reform was to establish a body with a customer service focus and that 2007-08 was the first year of that challenge. NI Water's customer contact performance improved in 2008-09 with five out of seven measures exceeding target and four out-performing the 2007-08 England and Wales average.
-

Part Six:
Efficiency



Part Six: Efficiency

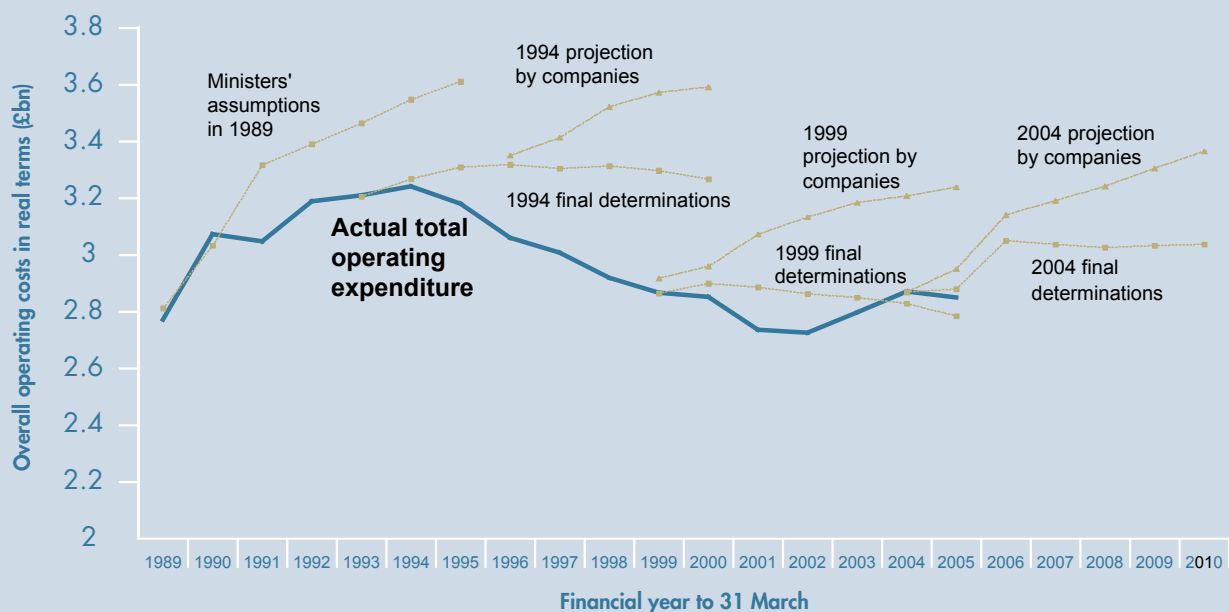
Improved efficiency is a key objective of water reform and economic regulation has a key role to play in this regard

6.1 The objective of water reform is not only to improve the quality of services, but to deliver them at a lower cost to customers and taxpayers. Like all water companies in the UK, NI Water is a monopoly provider and normal market competition cannot be relied upon to generate efficiencies of this kind. Economic regulation, however, as it is applied to the GB water industry, is intended to promote efficiency through 'comparative competition' by comparing companies' performance and setting targets based on the efficiency gap which each company needs to close. This approach has proved successful to date

and since privatisation of the water industry in England and Wales twenty years ago, companies have consistently out-performed efficiency targets (see Figure 24). Similarly Scottish Water has reduced operating expenditure by some £166 million¹⁹, exceeding its cumulative target reduction of 37 percent, over the four year period to 2005-06.

6.2 The size of capital investment programmes has tended to increase prices and average household bills in England and Wales have risen by about 42 percent over the past twenty years. Regulators have indicated, however, that without efficiency savings these prices would have been higher. For example average household bills in England and Wales fell sharply in 2000

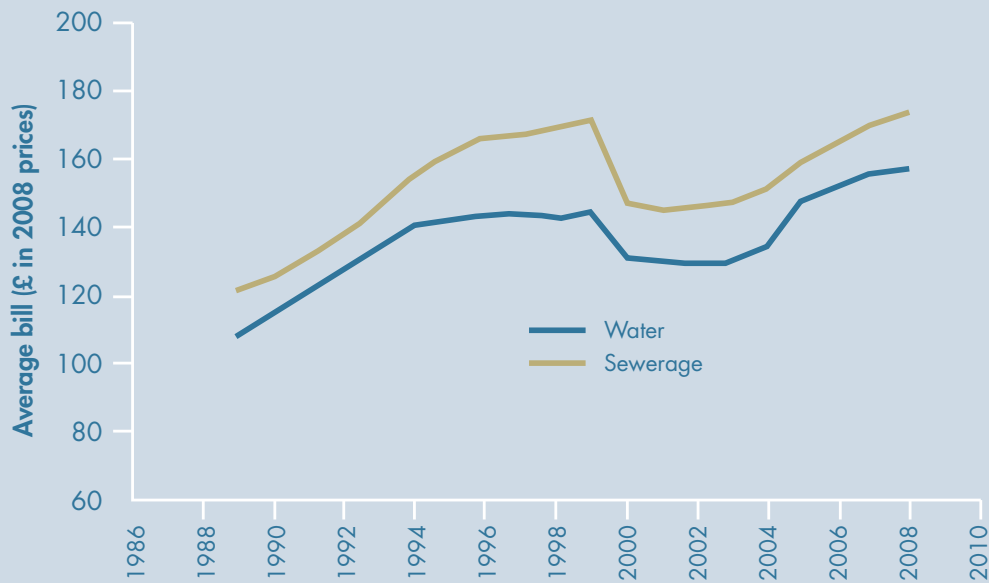
Figure 24: Performance against operating cost targets in England and Wales (2003-04 prices)



Source: Water Industry Commissioner for Scotland: Final determination 2006-10

¹⁹ Some £29 million of these savings are attributable to the merger of three companies into one entity. Efficiencies excluding merger savings are equivalent to 30 percent of operating expenditure.

Figure 25: Average household bills England and Wales



Source: Ofwat

and have only returned to pre 2000 levels in recent years (see Figure 25). In Scotland, WICS estimated that over the four year period to 2005-06, average household bills were 24 percent lower than they would have been without efficiency savings.

- 6.3 The Department told us that *“NI Water’s position could not be compared to privatised companies in England and Wales. Those companies have enjoyed 20 years of managerial and financial freedoms and flexibilities to address efficiency. NI Water is still 80 percent funded by government subsidy. It is constrained by public expenditure controls – a system in which the emphasis is on control of money rather than achieving efficiencies.*

For example, access to borrowing is prevented; the ability to use reserves is prevented and the use of management remuneration incentives, staff reductions and other freedoms are constrained by political decisions”. The Department takes the position that this report should consider NI Water’s performance during the Strategic Business Plan period against its key performance indicators (see paragraph 1.7 and Appendix 1).

- 6.4 We note that the ‘Financial Framework for NI Water’²⁰ indicates that the OFWAT model of economic regulation should be used in Northern Ireland to ensure value for money by *“comparison of the operating and capital costs of companies in England and Wales to assess their*

Part Six: Efficiency

relative efficiency". The Utility Regulator should then set targets on the basis of the efficiency gap that NI Water needs to close. The Department's view is that this is a document emanating from Direct Rule policies which anticipated that full customer charging would be in place by 2010; and in the absence of charging it could not acknowledge that these were matters for regulation.

Stakeholders agree that there is a significant operating efficiency gap compared to companies in England and Wales and targets have been proposed to address it

6.5 The Regulator has compared NI Water's operating efficiency with water and sewerage companies in England and Wales during its first year of operation in 2007-08. It reported a significant efficiency gap for both water and sewerage services estimating that to achieve a level of efficiency comparable to the 'frontier'²¹ performance in England and Wales, NI Water would need to reduce its operating costs by 49 percent. Broadly speaking this means that to match the efficiency of the England and Wales benchmark, NI Water would need to deliver an improved level of service in line with GB companies with half the level of operational funding. The Regulator has stated that while this efficiency gap is a significant challenge, it is not unprecedented, being comparable to the position in Scottish Water when it was set up as a publicly owned company.

6.6 For PC10, NI Water submitted a Business Plan to the Regulator which proposed an annual efficiency improvement of 3.6 percent over the three year period to 2013. The Regulator, however, proposed an increased efficiency challenge equivalent to 6.5 percent a year which would deliver additional operating efficiencies in the region of £26 million²². This would provide a rate of 'catch-up' over three years which is slightly above OFWAT's standard approach of 60 percent improvement over five years. Scottish Water was set a target of 80 percent catch-up over the four years of its first price control period and exceeded this target.

6.7 In agreeing the operating expenditure baseline the Regulator has considered a range of special factors which apply to NI Water such as a longer than average length of mains per property. NI Water's Business Plan proposed an increase in base year costs of £112 million over three years. The Regulator disallowed £55 million of these costs on the basis that they did not fulfil the criteria of being either new or outside the control of management. The effect of this cost disallowance, together with the additional efficiency challenge would be to reduce operating spend by a total of £65 million over the three years to 2013 (see Figure 26).

6.8 The Department told us that "*although the Regulator has taken account of special factors in proposing NI Water's operating expenditure, its estimate of special factors is significantly less than NI Water's total special factors claim over the three years.*

21 For the purposes of benchmarking, OFWAT's econometric model, compares efficiency with the 'frontier' company. This company must fulfil three criteria: no special concerns about data; no specific characteristics which significantly reduce costs; and it must be suitably large. This company may not be the lowest cost operator.

22 Water and Sewerage Service Price Control 2010-2013 Final Determination

Figure 26: Operating Expenditure 2003-04 to 2012-13



Source: *The Regulator*

NOTE: The costs from 2007-08 onwards exclude unregulated activities. This is different from the Water Service period as no distinction was made in these years between regulated and unregulated activity as regulation was not in place. Figures from 2007-08 onwards include opex plus the entire PPP unitary charge including capital repayments and interest.

The 2009/10 figure (£210m) represents the company forecast for this year based on half year projections.

NI Water's total claim was £24.5 million. The Regulator allowed £4.3 million of this (17.5 percent)".

The Department and NI Water are in discussion with the Regulator on years two and three of PC10

6.9 The Department and NI Water stated that they support efficiency and have accepted the efficiency targets in Figure 26 for 2010-11. Discussions with the Regulator are on-going to reconcile

2011-12 and 2012-13 with the public expenditure process (see paragraph 1.10). The Department does not accept the comparison with Scottish Water on the grounds that reorganisation and charging had already been introduced before Scottish Water came into existence and Scottish Water is a public corporation, not a publicly owned company. It also stated that Water UK²³ in response to the Draft Determination for PC10 commented that the targets set for NI Water were not unprecedented.

23 Water UK is the industry association that represents UK statutory water supply and waste water companies at national and European level.

Part Six: Efficiency

6.10 The Department believes that the information in Figure 26 should be considered within the context of:

- operating expenditure 2007-10 includes items such as voluntary severance schemes to enable efficiencies;
- some 2007-10 costs such as domestic billing capability are not included in the 2010-13 period;
- figures for 2007-10 do not necessarily compare on a like-for-like basis with 2003-07 for example Public Private Partnership costs;
- some additional spend after 2007 can be attributed to the need to meet mandatory EU standards; and
- some costs may be attributed to the change from Water Service to NI Water.

The Department emphasised that NI Water's Business Plan was a first step in setting costs for the period. It is not NI Water's 'position' and NI Water had offered reductions before the Regulator's Final Determination for PC10.

The Regulator has reviewed NI Water's capital programme and has proposed efficiencies in line with other UK companies

6.11 NI Water's Business Plan sets out a capital investment programme to deliver water quality and environmental improvements

as set out in the Department's Social and Environmental Guidance. This is intended to address many of the areas where performance could be improved (see Figure 27). Working on a baseline of £636 million NI Water proposed efficiencies of £37 million putting the cost of the programme at £599 million.

6.12 The Regulator has proposed three adjustments to the cost of this programme:

- removal of £51 million from the pre-efficiency baseline of £636 million resulting from reductions in the scope and cost of some projects while still delivering agreed outputs. This includes a regional price adjustment on the basis that NI Water's capital costs are 12 percent lower on average than GB
- additional efficiency savings of £21 million in addition to the £37 million proposed by NI Water to close a proportion of the efficiency gap compared with the upper quartile performance in England and Wales, and
- additional expenditure of £38 million for urgent works to reduce the risk of infraction proceedings and support development.

This gives a final figure for the programme of £564 million (see Figure 28). The Regulator considers that this capital investment plan meets the priorities of the Social and Environmental Guidance, aligns with customer views on priorities and delivers the necessary statutory obligations.

Figure 27: Summary of Planned Capital Investment Outputs (2010 – 2013)*Drinking Water*

- Water treatment upgrades (paragraphs 2.5 to 2.8)
- Drinking water safety plans to identify residual risks (paragraphs 2.15 to 2.18)

Wastewater

- Wastewater treatment schemes at 46 works with a population equivalent of more than 250 (paragraphs 3.7 to 3.10)
- Upgrade of 117 unsatisfactory intermittent discharges to meet quality standards (paragraphs 3.11 to 3.16)

Leakage

- Reduce leakage below the short-run Economic Level of Leakage
- Determine a long-run Economic Level of Leakage to inform reduction targets (paragraphs 4.13 to 4.16)

Customer Service

- Reduce the risk of low pressure at 800 properties (paragraphs 5.2 to 5.4)
- Reduce supply interruptions (paragraphs 5.5 to 5.10)
- Address the risk of sewer flooding in 200 properties (paragraphs 5.11 to 5.16)

Figure 28: Capital Expenditure 2010 to 2013

	£million
Proposed Investment pre-efficiency	636
Scope and cost adjustment	(51)
Efficiencies - NI Water Business Plan	(37)
Efficiencies – the Regulator	(21)
Additional Outputs	38
Total investment	564

Source: NIAO based on data from the Regulator (figures do not add due to rounding)

Appendices:



Appendix One:

Northern Ireland Water Key Performance Indicators						
		Actual 2006-07	Actual 2007-08	Target 2008-09	Actual 2008-09	Target 2009-10
KPI Customers						
1	Supply interruptions (%)					
	>6 hours	#	1.35	1.2	1.094	1.00
	>12 hours	0.13	0.25	0.15	0.259	0.15
	>24 hours	#	0.01	0.01	0.077	0.01
2	Response to billing contacts (%)	#	94.97	97	98.6	98
3	Response to written complaints (%)	91.4	90.61	97	97.6	98
4	Billing of metered customers (%)	#	95.14	95	93.25	95
5	Ease of telephone contact (%)	83.1	94.78	95	97.09	98
6	Ease of telephone contact (new)					
	- calls not abandoned (%)	#	#	99	98.88	100
	- calls not all lines busy (%)	#	#	99	100	99.8
	- customer satisfaction (score out of five)	#	#	4.35	4.4	4.6
7	Inadequate pressure (%)	#	#	#	#	945 properties removed
8	Sewer flooding – overload	#	#	#	#	#
9	Sewer flooding – other causes	#	#	#	#	#
10	Sewer flooding – risk of flood more than once in ten years	#	#	#	#	102 properties removed

Northern Ireland Water Key Performance Indicators						
		Actual 2006-07	Actual 2007-08	Target 2008-09	Actual 2008-09	Target 2009-10
KPI Cash						
11	Leakage - million litres per day	168.06	156.52	146	180.9	176.93
12	Operating margin -excluding exceptionals (%)	27.52	25.72	27.74	27.00	23.78
13	Comparative operating efficiency - £million	#	#	38.6	Note	53.8
14	Comparative capital cost efficiency (%)	#	#	8.3	Note	17
15	Billing					
	(a) bills issued within 5 working days excluding investigations	#	#	#	#	#
	(b) bills issued within 5 working days including investigations	#	#	#	#	#
16	Days sales outstanding					
	(a) measured	#	67	63	64	76
	(b) unmeasured	#	#	33	87	58

Northern Ireland Water Key Performance Indicators						
		Actual 2006-07	Actual 2007-08	Target 2008-09	Actual 2008-09	Target 2009-10
KPI People						
17	Health and Safety – reduction in days lost due to accidents	19	16	15	14	12
18	Manpower numbers	1744	1726	1716	1617	1304
19	Staff attendance (%)	94.2	95	95.7	95.3	95.7
20	Staff satisfaction (score out of 100)	#	#	#	#	73.2

Appendix One:

Northern Ireland Water Key Performance Indicators						
		Actual 2006-07	Actual 2007-08	Target 2008-09	Actual 2008-09	Target 2009-10
KPI Compliance						
21	Drinking water – mean zonal compliance	99.33	99.30	99.35	99.49	99.65
22	Operational Performance Indicator (%)	99.33	98.98	98.95	99.22	99.05
23	Waste water quality					
	(a) works compliant (%)	84.0	84.23	86	87.84	87.00
	(b) population equivalent compliant (%)	77.0	84.38	89	90.24	93.50
24	Wastewater Treatment Works compliant with UWWTD (%)	#	86.01	90.5	92	93
25	Pollution incidents (high / medium)	#	60	56	56	56
26	Completion of capital schemes (%)	93	96.6	90	90.6	90.0

- not measured / no target Green figures – targets achieved Red figures – targets not achieved

Note : NI Water is developing the methodology for the measurement of effectiveness in conjunction with the Department and the Regulator. NI Water has reported these as "on track for achievement" on the basis that efficiencies have been deducted from annual budgets.

Appendix Two:

The Overall Performance Assessment

1. The Regulator has adopted an Overall Performance Assessment (OPA) to summarise NI Water's performance. It was originally developed by OFWAT as a means of measuring and comparing the performance of water companies, by giving a points score for 17 performance indicators. This approach is also used by WICS in Scotland. The Regulator prepared scores for 11 indicators for 2007-08 because sufficiently robust data was not available for the other six indicators mostly relating to sewer flooding and security of supply.
 2. The Regulator assessed some of NI Water's performances as in line with the England and Wales average, namely, hosepipe restrictions, leakage, sewage sludge disposal and pollution incidents from water treatment sources. However, NI Water's total score of 98 out of a possible 304 is below the range of scores achieved in England and Wales (see Figure A). To reach the England and Wales average, NI Water would need to improve its overall score by 178 points in the areas of waste water treatment, pollution control, drinking water quality, low pressure, customer service and supply interruptions (see Figure B).
 3. The Department does not accept that the OPA is an appropriate measure of NI Water's performance because it was designed to benchmark the water companies in England and Wales at a more advanced stage of development and after considerable investment in infrastructure.
 4. The Regulator has considered suggestions from some stakeholders to amend the model to make it more suitable to NI Water's current level of service and to take account of 'legacy' issues that remain from the Department's Water Service. Having consulted with all parties involved including the Northern Ireland regulatory bodies, OFWAT and WICS, the Regulator decided to retain the conventional model of the OPA because it allows benchmarking with other UK service providers and presents a consistent means of measuring improvements in Northern Ireland from an established baseline.
 5. The views of the Department and the Regulator are set out in detail on pages 72 to 76.
-

Appendix Two:

Figure A: Overall Performance Assessment 2007-08

	Max OPA Score	E&W average	NI Water
Low pressure	38	36	4
Unplanned interruptions	38	31	22
Hosepipe restrictions	13	13	13
Customer Service	38	31	4
Drinking water quality	50	46	5
Sewage sludge disposal	13	13	13
Leakage	13	13	13
Water Pollution incidents	13	12	13
Sewage Pollution incidents (High and Medium)	25	23	3
Sewage Pollution incidents (low)	13	11	3
Sewage Treatment Works consent breaches	50	46	5
TOTAL	304	275	98

Source: 2007-08 Cost and Performance Report, NI Regulator published March 2009

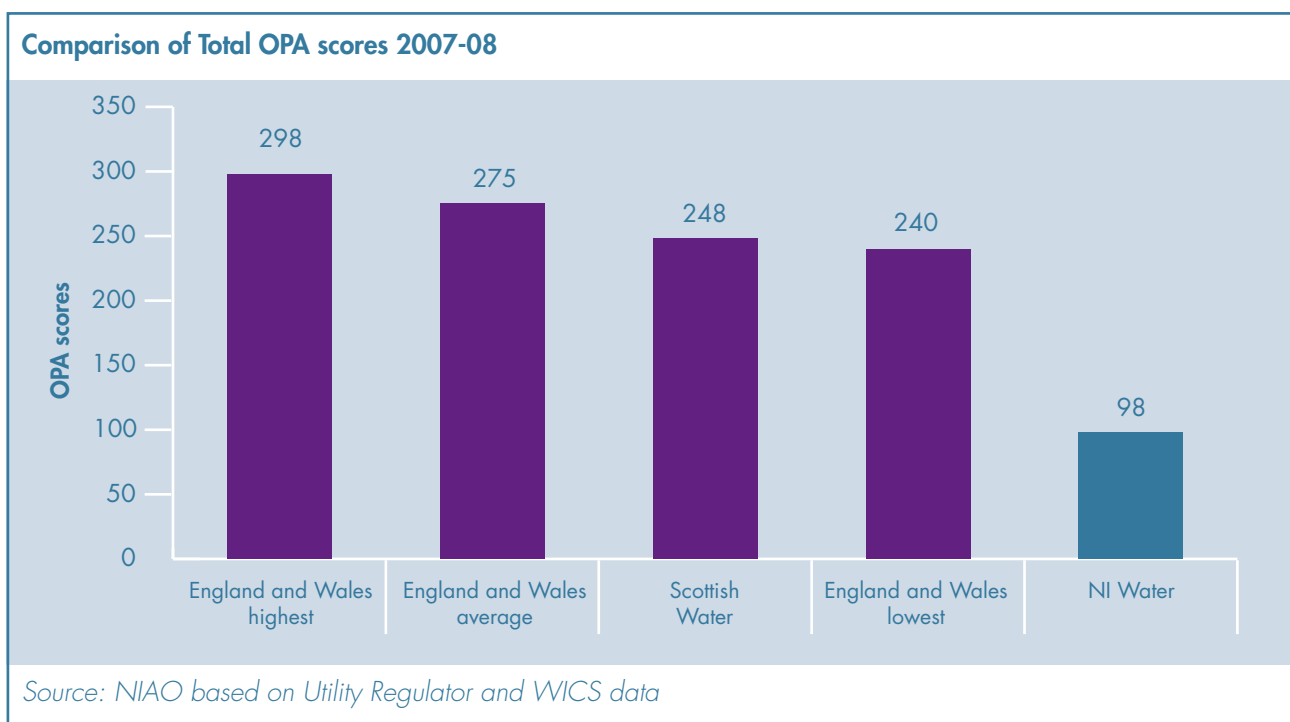
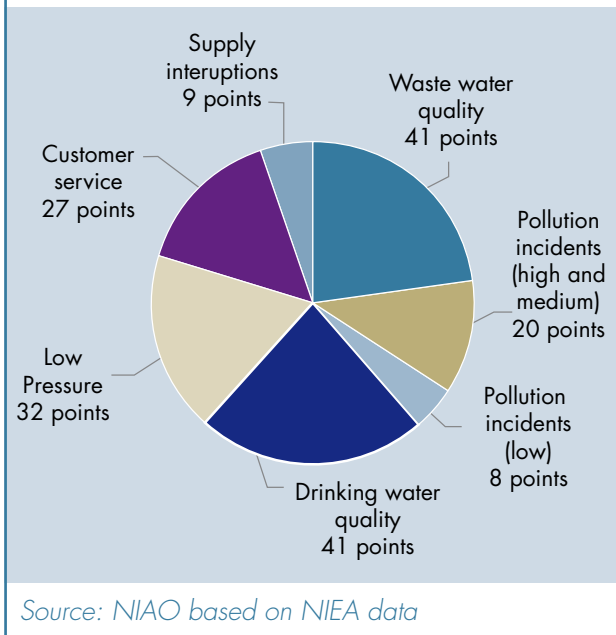


Figure B: Areas where NI Water could improve performance (OPA points gap compared with the E&W average)



The Department's view

On Benchmarking and the OPA methodology

The Department supports the use of benchmarking as a useful way to assess NI Water's performance. But it disagrees with the Regulator's use of the OPA methodology as an accurate assessment of NI Water's performance. As the Regulator has noted, "*the water industry in Northern Ireland is still in transition*". Naturally NI Water's performance will fall short of water companies in England and Wales which completed their transition some years ago. Scottish Executive colleagues have advised the Department that it will have taken 13 years for Scottish Water to reach the level of English and Welsh water companies. The Department considers that to form an accurate impression of

NI Water's performance requires comparison with GB companies at an equivalent stage of their development. It is the Department's view that the focus on comparing NI Water's performance with the present performance of water undertakers in the rest of the UK, particularly England and Wales is misleading.

The Department is of the view that an example of a more relevant approach to benchmarking is the WICS 2002-03 Customer Service Report on Scottish Water. Scottish Water is often lauded by the Regulator as a company which has made a swift transition. Scottish Water's overall OPA score in 2002-03 was similar to that of NI Water now. In terms of some measures like properties subject to low pressure or unplanned interruptions to supply of more than 12 hours, Scottish Water's performance was assessed as better than NI Water's is now. On the other hand the quality of drinking water supplied by NI Water is higher now than that supplied by Scottish Water in 2005. An interpretation of this benchmarking suggests that NI Water is good on water quality, less good on pressure and not good on supply interruptions.

Using the Regulator's benchmarking approach of directly comparing NI Water performance with current GB undertakers' performance the interpretation would be the opposite. The largest gap would appear to be on water quality with the smallest on supply interruptions. The Department's view is that the former interpretation is more accurate in reality. The Department and NI Water agree that it is good to have common measures and that benchmarking is helpful. However, the Department does not agree that the OPA methodology should be the driver of NI Water's performance.

Appendix Two:

Although WICS adopted the OFWAT OPA methodology for use in Scotland, it was tailored to suit the Scottish context. Elements were removed which did not lend themselves to direct comparisons with English and Welsh water companies.

The Executive has agreed the Regional Development Minister's Social and Environmental Guidance. While the Department accepts that the Executive could have chosen simply to follow methodologies adopted in GB (principally the OPA methodology) it points out that this is not what the Executive has agreed should be NI Water's priority. The Department agrees that benchmarking can be informative if made in context. A number of measures which the Executive has agreed are consistent with those used in GB and should be measured on the same basis. The Executive's approach does not encompass pursuit of achieving OPA scores comparable to GB as an aim.

On the level of investment

Private companies in England and Wales have, through 20 years of domestic and non-domestic charging, been able to invest over £80 billion in capital works to improve and maintain water and wastewater quality. To put the investment spend of the English and Welsh water companies into context, the current levels are double the pre-privatisation levels in the 1980s (source: Water UK). NI Water has not benefited from such a prolonged period of increased investment.

The Department were advised that the minimum expected performance levels were set by OFWAT nine years after privatisation, i.e. after nine years of substantial investment, and are therefore well above the levels that would be expected of NI Water in its first year of operation. Thus, the

Department is of the view that the OPA scoring mechanism (based on a set of GB performance envelopes) does not provide a proportional assessment of NI Water's performance relative to the rest of the UK.

On OPA as applied to Drinking Water quality

The OPA metric is used to differentiate between the relative performance of water and sewerage companies with very similar levels of service – defined by OFWAT in terms of a set of predefined performance ranges for each of the 17 OPA comparators. Performance levels which fall just below the expected OFWAT performance envelope in a given comparator result in the minimum score for that comparator.

The Department notes that despite marginal differences in water quality, application of the OPA methodology results in massive differences in scores between NI and GB. A casual observer would conclude that a severe gap existed. In the Department's view this would lead to perverse investment decisions – diverting funding into an area where there has been significant investment and improvement and high standards are already being achieved. Of necessity, this means less focus on other areas where more investment is needed. The Department does not accept that the methodology should drive these decisions.

This demonstrates the confusing consequences of using OFWAT's OPA in the Northern Ireland context. Despite the very slight difference in actual water quality, the narrow OPA 'performance envelope' anticipated by OFWAT for England and Wales water companies (almost 20 years after privatisation) results in NI Water achieving only the minimum possible OPA score for water quality.

The Regulator's view

On benchmarking and the OPA methodology

The Regulator considers that the substantial difference in the OPA score is not itself grounds for criticism of NI Water. A fair assessment of NI Water's current performance must take account of its legacy of poor data, weak systems and underperforming assets. The OPA provides a single concise measure of performance which will allow NI Water to demonstrate improvement in service. OPA targets set for the regulatory price control take account of historical performance and reflect the level of investment available to NI Water over the price control period. Adopting this approach, which is consistent with both WICS and OFWAT, facilitates the setting of appropriate targets for NI Water as well as robust comparisons. It challenges the company to outperform its targets in striving to reach higher industry performance standards.

OFWAT's OPA score reflects measurement of performance and service over 17 measures. Due to poor data predominantly relating to flooding incidents and interruptions to supply, the Regulator has adjusted NI Water's OPA score to reflect only 11 measures. The outstanding measures are particularly important to the customer base and a focus over the PC10 period will be to have these important measures included in the scoring assessment.

In England and Wales the OPA has measured and contributed to significant improvements in service. The approach is also used by WICS in Scotland where it is considered to have been a major driver of the large scale and rapid improvements in service. Scottish Water outperformed their target and improved their score of 132 in 2002-03 to 252 in 2008-09.

Given the level of investment supported in PC10 the challenge for NI Water is to raise its OPA score from 117 in 2009-10 to 204 in 2012-13.

The PC10 OPA target for NI Water has been established based upon the investment and associated outputs to be delivered by NI Water over the period. The challenge is therefore relative and appropriate to NI Water. The benchmarked position encourages [NI Water] to outperform the target by striving to further close the performance gap as soon as possible.

On the level of investment

By 2010, Water Service and NI Water will have invested at equivalent levels per property to companies in England and Wales on average. A significant proportion of this investment has been made since 2004 as Northern Ireland delivered water quality and wastewater quality improvements later than England and Wales. NI Water's performance is improving as this investment takes effect. Investment in NI Water will continue at higher levels than envisaged in England and Wales until 2013 and further improvements in performance are expected as a result.

The OPA is not in itself a driver for investment, the challenge to achieve a target score by the end of the price control period being an assessment of the level of funding allowed in the price control.

On OPA as applied to Drinking Water quality

The Regulator understands the Department's concern that the OPA score for drinking water quality is very low and it may be viewed out of context and consequently gives rise to issues over the overall drinking water quality. The Regulator told us that the very low OPA score for drinking water is a consequence primarily of high levels

Appendix Two:

of THMs and this puts NI Water's performance outside the scoreable range for the OPA, resulting in a minimum score. The Regulator gave specific consideration to the inclusion or exclusion of the drinking water measure in the overall OPA but decided to include it for the following reasons:

- The funding provided within PC10 supports a significant uplift in the Drinking Water Quality Score with some 23 points being added. Despite the poor comparison of this individual score to the England and Wales score, DWI supported its inclusion as a means of improving and sustaining the high quality of drinking water whilst addressing the THM failures.
- A major advantage of the OPA score is that it provides a single easily understood measure of how NI Water is performing against a wide range of targets; it balances and embraces both quality and service performance issues. In Scotland over a number of price controls it provided a major motivator for improvement despite the 13 year period it took to close the gap with its comparator England and Wales companies.

The Regulator noted that this issue can also arise for other components of the OPA. The calculation of the score for a component of the OPA relates to upper and lower limits in a performance band. A maximum of 50 points is awarded for meeting or exceeding the upper end of the range and a minimum of 5 points for performance at or below the lower end of the range. The points awarded for each component are weighted to give the OPA score. The maximum points available for the 11 components considered for NI Water's 2007-08 OPA are set out in Figure A. The upper and lower limits in a performance band

are developed by OFWAT relative to historical performance in England and Wales. **As a result, care needs to be taken when interpreting and using the OPA score. For example:**

- For a number of the components, NI Water was below the lower limits of the performance band in 2007-08 and achieved only the minimum score for those components. This may reflect historical levels of performance and investment and should not necessarily be taken as a criticism of the company.
- The improvement in the OPA is not linear. A score of 5 for drinking water quality compared to an average for England and Wales of 46 does not indicate a performance 10 times worse than England and Wales, rather it is reflective of the scoring mechanism of the OPA.
- Where NI Water makes improvements but remains below the lower limit of the performance band, no improvement registers in the OPA. Once NI Water's performance moves into the OPA performance range, improvement in the OPA score for that component may be rapid.

The principal of this methodology is not to reward performance below a minimum standard but to incentivise and reward improving performance within what is judged an acceptable range. NI Water itself has stated its aspiration to be the number one performing company by 2014. The Regulator is clear that the target OPA for PC10 is a measure and reflection of the level of investment provided for in the Final Determination, not a benchmarked target to England and Wales.

Appendix Three:

Mean Zonal Compliance

Mean zonal compliance is an index developed by the Drinking Water Inspectorate for England and Wales to provide for better comparison of performance across different companies. All drinking water regulators in the UK are now reporting mean zonal compliance figures using the same methodology which facilitates comparison across regions. DWI in Northern Ireland used this approach for the first time in 2004. Previously percentage compliance was calculated simply on the basis of the number of tests failing.

Mean zonal compliance is calculated in two stages:

Stage 1: The mean percentage compliance is calculated for each *parameter* across all supply zones (currently 61 in Northern Ireland)

Example: Mean Zonal Compliance (MZC) for the 'colour' parameter 2008					
	(a) Number of Supply Zones	(b) Number of samples	(c) Number of failures	(d) % Zonal Compliance (b-c x 100) b	Numerator of MZC Calculation (a x d)
Compliant Supply Zones	59	2,088	0	100.00	5,900.00
Non-compliant Supply Zone 'A'	1	24	1	95.83	95.83
Non-complaint Supply Zone 'B'	1	12	2	83.33	83.33
Totals	61	2,124	3		6,079.16

$$\text{Mean Zonal Compliance for Colour} = \frac{6,079.16}{61} = 99.66\%$$

Stage 2: The overall mean zonal compliance is simply the arithmetic mean of all 40 parameters as shown in the table which follows:

$$\text{Mean Zonal Compliance} = \frac{3,979}{40} = 99.49\%$$

Appendix Three:

Mean Zonal Compliance 2008		
No.	Parameter	Zonal Compliance %
1	Total Trihalomethanes	86.43
2	Iron	98.24
3	Lead	98.57
4	Aluminium	98.88
5	E.coli	99.44
6	Manganese	99.47
7	Colour	99.66
8	Mercury	99.71
9	Pesticides-total substances	99.71
10	Enterocci	99.80
11	Pesticides-other substances	99.81
12	Hydrogen Ion	99.95
13	Turbidity	99.96
14	Odour	100
15	Taste	100
16	Sodium	100
17	Nitrate	100
18	Nitrite	100
19	Nitrate/Nitrite Formula	100
20	Copper	100
21	Fluoride	100
22	Arsenic	100
23	Cadmium	100
24	Cyanide	100
25	Chromium	100
26	Nickel	100
27	Antimony	100
28	Selenium	100
29	PAHs (sum of 4 substances)	100
30	Boron	100
31	Benzo(a)pyrene	100
32	Tetrachloromethane	100
33	Tetrachloroethene/Trichloroethylene (sum of 2 substances)	100
34	1,2-dichloroethane	100
35	Benzene	100
36	Bromate	100
37	Aldrin	100
38	Dieldrin	100
39	Heptachlor	100
40	Heptachlor epoxide	100
Total		3,979

Appendix Four:

Pollution Incident Classification Systems	
NIEA Pollution Incident Assessment Criteria	Environment Agency (GB) Pollution Incident Categories
<p>HIGH: A major incident involving one or more of the following:</p> <ul style="list-style-type: none"> • Potential or actual persistent effect on water quality or aquatic life • Closure of potable water, industrial or agricultural abstraction if necessary • Extensive fish kill • Excessive breaches of consent conditions • Extensive remedial measures necessary • Major effect on amenity value 	<p>CATEGORY 1: The most serious</p> <ul style="list-style-type: none"> • Persistent and extensive effects on quality • Major damage to the ecosystem • Closure of a potable abstraction • Major impact upon amenity value • Major damage to agriculture and/or commerce • Serious impact upon man
<p>MEDIUM: A significant pollution incident involving one or more of the following:</p> <ul style="list-style-type: none"> • Notification to abstractors necessary • Significant fish kill • Measurable effect on invertebrate life • Water unfit for stock • Bed of water course contaminated • Amenity value to the public, owners or users reduced by odour or appearance 	<p>CATEGORY 2: Significant but less severe</p> <ul style="list-style-type: none"> • Significant effect on quality • Significant damage to the ecosystem • Non-routine notification of abstractors • Reduction in amenity value • Significant damage to agriculture and/or commerce • Impact on man
<p>LOW: A minor incident resulting in localised environmental impact only. Some of the following may apply:</p> <ul style="list-style-type: none"> • Notification of abstractors not necessary • Fish kill of less than 10 fish (species of no particular importance to the affected water) • No readily observable effect on invertebrate life • Water unfit for stock watering • Bed of watercourse only locally contaminated • Minimal environmental impact and amenity only marginally affected 	<p>CATEGORY 3: Relatively minor</p> <ul style="list-style-type: none"> • Minimal effect on quality • Significant damage to local ecosystems • Marginal effect on amenity value • Minimal impact to agriculture and/or commerce
<p>UNSUBSTANTIATED: A reported pollution incident which, upon investigation, proves to be unsubstantiated, i.e. no evidence can be found of a pollution incident having occurred.</p>	

Appendix Five:

Pollution incidents caused by Water Service / NI Water									
Pollution Incidents	2000	2001	2002	2003	2004	2005	2006	2007	2008
All Incidents:									
Substantiated	1705	1546	1510	1551	1227	1174	1133	1291	1237
Unsubstantiated	882	998	924	948	980	1009	948	999	1007
Total	2587	2544	2434	2499	2207	2183	2081	2390	2244
NI Water incidents	322	305	259	364	289	307	285	363	277
Percentage of total Ranking	19%	20%	17%	24%	24%	26%	25%	28%	22%
			3rd	2nd	2nd	1st	1st	1st	2nd
Seriousness of incident:									
High	3	6	2	7	1	1	6	2	0
Medium	59	60	35	57	62	42	36	63	56
Low	260	239	222	300	226	264	243	298	221
Total fish kills	45	45	15	24	18	10	19	15	22
NI Water fish kills	9	8	1	6	4	2	7	2	2
<i>Source: NIAO based on NIEA data</i>									

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