Northern Ireland Water Limited
Northern Ireland Authority for Utility Regulation

Reporter's Report
on
Northern Ireland Water's
Annual Information Return 2007-08

December 2008

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REPORTER'S REPORT ON NORTHERN IRELAND WATER'S ANNUAL INFORMATION RETURN 2008

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Document issue details:

B&V project no. 121144 1000A Client's reference no. AIR 2008 PD

Version no.	Issue date	Issue status	Distribution
01	05/12/08	Final	NIAUR

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REPORTER'S REPORT ON NORTHERN IRELAND WATER'S ANNUAL INFORMATION RETURN 2008

1 INTRODUCTION

1.1 General

Northern Ireland Water Limited (NI Water) submitted its first Annual Information Return to the Northern Ireland Authority for Utility Regulation on 29 August 2008 which covers the first year of operation of the Company.

The Annual Information Return 2008 is submitted in sections:

- A Board Overview
- The main commentary and data tables.
- The Service Target Report

This report on NI Water's Annual Information Return 2008 has been prepared for the Northern Ireland Authority for Utility Regulation (the Utility Regulator) by the Reporter in response to the reporting requirements.

1.2 Key Roles and Responsibilities

1.2.1 The Northern Ireland Authority for Utility Regulation

The Northern Ireland Authority for Utility Regulation (the Utility Regulator) has general duties under the Water and Sewerage Services (Northern Ireland) Order 2006 for the regulation of the water industry in Northern Ireland.

1.2.2 Northern Ireland Water Limited

Northern Ireland Water Limited (NI Water) is a government owned Company which was created in April 2007 when it took responsibility for water and sewerage service from the Northern Ireland Water Service (an agency of the Department for Regional Development).

NI Water has been appointed to provide water and sewerage services in Northern Ireland under Licence granted by the Department for Regional Development.

NI Water has also been nominated as the successor Company for the purpose of Part X of the Water and Sewerage Services (Northern Ireland) Order 2006.

1.2.3 The Reporter

Mr J Mills, a Technical Director of Black & Veatch Limited, has been appointed as the Independent Reporter to Northern Ireland Water. The Reporter's primary duty of care is to the Utility Regulator. The Reporter also has a duty of care to NI Water. The Reporter's role and method of working is set out in the Reporter Protocol published by the Utility Regulator. Individual items of work are undertaken in response to reporting requirements developed by the Utility Regulator.

This report has been prepared by the Reporter supported by Black & Veatch staff and consultants.

1.3 The Annual Information Return

Northern Ireland Water Limited's Annual Information Return for 2008 is a statement of financial and non-financial information covering the activities and performance of the Company in 2007-08. The return, which is made to the Utility Regulator in response to information requirements issued by the regulator, allows the Utility Regulator to:

- monitor the companies progress towards achieving higher quality objectives;
- ensure that customer's standard of service are protected;
- compare the performance of the Company with similar companies in England, Wales and Scotland both now and over time;
- measure the costs of the Company and compare these with similar companies in England, Wales and Scotland; and
- prepare for the next review of price limits.

1.4 The Reporter's Report

The remainder of this report follows the sections of the reporting requirements and report tables with individual sections on:

- Table 1 to 17g, excluding Table 6A.
- Tables 21 and 22.
- Table 25.
- Tables 32 to 38, 40 and 41.

2 TABLE 1 – KEY OUTPUTS – WATER SERVICE - 1

2.1 Key Points

1. The Company published a Water Efficiency Plan in 2004. The Company is developing a new plan which it intends to publish following resolution of issues relating to billing and, in particular decisions on domestic metering.

2. The Company's main water efficiency activity is leakage reduction where the Company has implemented a major programme of leakage reduction which has resulted in sustained reduction in bottom up measured leakage being reducing over the last 6 years

3. The Company undertakes an education programme to schools, and operates a 'Water Bus' and education centres at the Silent Valley and Duncrue Street to promote water conservation. The Company also uses press releases and van logos to promote the water conservation message.

4. The Company has only completed lines 1, 9 and 30 of the return reflecting limited current activity on water efficiency measures. The Company has not estimated volumes of water saved or the cost of individual initiatives.

5. The Company does not offer a subsidised or free domestic supply pipe repair or replacement service. The reported household supply pipes repaired were repaired as a result of bursts or leaks being identified through the Company's leakage investigations resulting in Leakage Notices being issued.

6. The Company does not offer to carry out water audits, or distribute water audit packs.

7. At present, water efficiency programmes are not targeted at non-households. The Company does offer a large user tariff which is dependent on the customer's commitment to water efficiency.

8. The Company developed its programme of water efficiency measures before publication of the Ofwat's 'Water efficiency initiatives – good practice register'. We understand that the Company is considering the Ofwat publication as it updates its Water Efficiency Plan.

2.2 Approach to audit

During our audit we:

- Reviewed the reported data and Company commentary.
- Met with the Head of Leakage and the Leakage Programme Manager, who together manage the leakage programme and leakage policy for NI Water. Sample documentation was tabled for inspection.
- Met with the Water Education Officer, who organises and carries out the water conservation education programme, and distributes 'Hippos' and water education packs.

2.3 Commentary on the Company's methodology

Water Efficiency Plan

The Company published a Water Efficiency Plan in 2004. The Company is developing a new plan which it intends to publish following resolution of issues relating to billing and, in particular decisions on domestic metering.

Water efficiency education programme

The Company has a significant water conservation education programme. This included a programme of presentations to schools (119 in 2007/08), and a smaller number of presentations to other community and social groups.

The Company has two education centres which are used to promote water efficiency: one located at the Silent Valley; the other located at Duncrue Street STW.

The education programme includes a 'Waterbus' for mobile presentations including presentations to schools. A water conservation awareness pack is given out which typically contains a pencil, shower timer, fridge magnet, water saving booklet, 'Bob and Flo' bookmarks. Teaching aids distributed also include a 'snakes and ladders' water efficiency game, and leaflets on 'Drought-resistant Gardening' and 'Using Water Wisely'.

Water Efficiency Information

The Company provides limited information on water efficiency through its web site, including information supporting other water efficiency initiatives, as follows:

- Information on the Water Bus campaign.
- A "water smart code" providing general information on the value of water and water saving tips.
- A teachers information pack with resources and contact details for NI Water's education team.
- A "using water wisely leaflet" also providing general information on the value of water and water saving tips.

We understand that NI Water intends to review its web page to make information on water efficiency accessible from one location. We understand that the Company will include its Water Efficiency Plan on its web site once the new plan is published.

Supply pipe leak repairs.

Repairs to household supply pipes are carried out by householders in response to Leakage Notices issued by the Company. Household supply pipe leakage is detected during leakage investigations in distribution zones which display high leakage rates based on night-time metering, and soundings. A Leakage Notice requires a householder to repair their supply pipe within 28 days. If this is not done the work can be carried out by NI Water and re-charged to the householder.

NI Water has no specific funding for, and does not operate, a subsidised household leakage programme. The introduction of a funded subsidised household leakage programme would

provide an incentive (or remove the disincentive) for householders to notify NI Water of suspected leaks allowing leaks to be identified and repaired earlier.

Water saving devices.

The Company issues cistern displacement devices during visits to schools as part of the schools education programme.

The Company does not issue or promote or subsidise other water saving devices such as water butts, or trigger hoses.

Water audits

The Company does not offer water audits of household or commercial customers. The Company does provide information on self audit and tips are made available on using water wisely.

2.4 Commentary on individual line entries including confidence grades

Lines 1 to 8 The reported number of household supply pipes repaired is taken from a register of 'Leakage Notices' issued.

The Company was not able to distinguish between pipes repaired and pipe replaced and the total number of supply pipes repaired or replaced is reported in Line 1.

The confidence grade of C5 is appropriate because the reported numbers of repairs also includes a period in the reporting year before the formal 'Leakage Notice' process was initiated. Under this early process, letters were issued to householders, but no checks were made to see that the repairs were completed. It is therefore not known what proportion of these letters resulted in successful repairs being carried out and it is likely that some leaks were not repaired.

The Company does not provide free or subsidised supply pipe repair or replacement.

The Company has estimated the water saving from supply pipes repair or replacement but as not reported the figures because it does not relate to free or subsidised repairs.

Lines 9 to 22 The Company distributes "hippo" bags through its education programme, mainly to teachers at the schools visited. It is not known whether they are taken home or used in the schools.

The Company does not distribute other water saving devices. The Company has not estimated the volume of water saved or the cost of individual initiatives.

Lines 23 to 28 The Company does not have water efficiency initiatives for non-household customers. The Company does have key account managers for major non-household customers who can provide advice on water efficiency. We understand that specific water efficiency advice was not provided in the report year as new roles and relationships were being established. We understand

that the Company's strategy for 2008-09 includes providing water efficiency advice

The Company operates a large tariff discount scheme which is dependent on the commitment of the customer to water efficiency.

Lines 29 to 30 The Company has reported the cost of water efficiency measures and provided an itemised list in its commentary. The reported costs are an allocation of proportion of the costs of the Company's two education officers to reflect their involvement in water efficiency education. The reported costs exclude:

- The cost of supply pipe leakage repair and replacement which should be reimbursed by customers.
- The costs of the Education Centres which contribute to water efficiency education.

Lines 31 to 33 The Company does not identify any other water efficiency methods.

3 TABLE 2 – KEY OUTPUTS – WATER SERVICE – 2

3.1 Key Points

General

1. The Company has completed the table with the following exceptions:

   i. Properties receiving low pressure at the start of the year.

   ii. Properties receiving low pressure but excluded from the DG2 report.

DG2 properties receiving pressure/flow below reference level

2. The Company has provided an assessment of DG2 properties receiving pressure/flow below reference level for the first time. This is based on a comprehensive and detailed analysis undertaken in the report year which was based on hydraulic models where available or critical point pressure logging where models are not yet available. We believe that the assessment provides a substantive baseline position which provides a basis for more detailed assessments of areas and properties at risk. However, it remains an estimate and further investigation would be required to confirm the status of any individual property.

3. The properties on the DG2 register represent 1.4% (1 in 75) of properties in Northern Ireland. Reports of other water companies in England & Wales and Scotland show that this is the highest proportion of all the companies, with Scottish Water next at 0.31 %. In England & Wales, where the privatised companies have been funded to eliminate these problems since 1990, the proportion of properties on the DG2 register in 2006-07 ranged from 0% up to 0.04%.

4. We understand that the Company has undertaken work in distribution zones since the modelling and monitoring work used to develop the DG2 baseline was undertaken. The impact of this work has not been accounted and is currently being investigated by the Company.

5. It is possible that further investigation of low pressure properties will show that simple solutions such as refurbishing pumps, opening valves or rezoning will restore pressure to acceptable levels at low cost.

DG3 Properties affected by supply interruptions

6. The Company has improved the administration of its DG3 register this year and consequently improved the confidence grades from B4 to B3.

Population

7. The estimate of winter population is the total projected population in Northern Ireland plus an allowance for non-resident population in visitor accommodation.

DG4 – Restrictions on water use

8. The Company has not identified any restrictions on water use in the report year. The Company has advised us that NIWS had not imposed restrictions on water use in the past.

3.2 Table 2 - Block A – DG2 Properties Receiving Pressure/Flow Below Reference Level

3.2.1 Approach to audit

During our audit we:

- Met with the Company and reviewed the two methodologies adopted to populate the DG2 register.
- Viewed the results from the models on the GIS layers.
- Checked property levels against OSNI POINTER data.
- Compared the results from the two methods where an overlapped occurred.

3.2.2 Commentary on the Company's methodology

DG2 Register

The Company's baseline DG2 assessment will form the basis of a DG2 register. The reporting requirements are addressed as follows:

Reporting Requirement	NIW DG2 Register
The address of the property affected.	Individual property addresses have been identified.
The method of assessment.	The method of assessment is given as either Hydraulic modelling; or Pressure logging Identifying the two methods of assessment described below.
The cause of low pressure.	NIW has only recently completed its analysis to identify properties at risk of low pressure. Detailed investigations have not been carried out to identify cause.
Details of incidents identified (date, time, duration, minimum pressure, and whether covered by an exclusion).	The register does not identify details of incidents. Some information on incidents will exist through customer contacts and subsequent investigations recorded on paper records and in the new customer contact systems. These have not been collated and reconciled with the new DG2 register.
Action taken to resolve the problem (if any).	The register has been developed to identify properties currently at risk and no action has yet been taken to resolve problems. We note above that the baseline assessment represents the detailed of models and measurements at a time and work on the current programme may already have addressed problems of low pressure at some of the properties identified on the register.
The name of person responsible for the information.	The name responsible for completing the register is not completed.

The current register is maintained on spreadsheet which is controlled by Operation Services. In the past we have found that it is more difficult to maintain the integrity of a spreadsheet as a data set over time and that spreadsheet systems do not have the functionality of databases which allows audit trails of complex records to be maintained. We recommend that the Company considers developing the register into a database format which could be maintained as a corporate data set with associated update and version controls.

Level of service reported.

The reference level of service is a flow of 9l/min at a pressure of 10m head on the customer's side of the main stop tap. Because of the difficulty in measuring pressure and flow at the stop tap, companies may measure against a surrogate reference level. Companies should use a surrogate of 15m head in the adjacent distribution main unless a different level can be shown to be suitable.

NI Water has chosen to report against a surrogate level of service of 15m head in the adjacent main relative to the estimated elevation of ground level at the property.

Methodology for populating the DG2 register

Northern Ireland Water Service did not have a DG2 property register and was unable to report against this measure at the end of 2006/07.

During 2007/08, the Company undertook a comprehensive DG2 baseline analysis based on a combination of detailed hydraulic modelling and pressure logging.

Hydraulic Modelling Methodology

An estimated 66% of the properties served are covered by distribution zone studies which included hydraulic modelling. We report on the Company's distribution zone studies in Section 17.5. Distribution models were used to predict pressure at the distribution nodes in the model. A subsequent mapping exercise on GIS allowed the node pressures to be related to property level and to determine the level of service against a surrogate of 15m head.

The Company advised us that the Average Day Peak Week (ADPW) demand condition was used to derive the distribution node pressures that were used to determine the DG2 level of service. The calibration model was factored to produce an ADPW demand model. The pressures predicted should therefore represent a scenario when there are, on average, at least 3 days with higher demands and consequently the likelihood of lower pressures. Typically there will also be a day or two not in the peak week which will also have a higher demand than the ADPW demand. This scenario is therefore consistent with the allowable exclusion for 5 days transient in the year.

Having estimated pressure at the distribution nodes, the level of service for each property was determine through a mapping exercise on GIS using the following routine:

- The location and elevation of the property was obtained primarily from the OSNI POINTER database but with the aid of old OSNI Hybird data, on-site surveys and OSNI vector maps.

- The elevation of the ferrule associated with a property was estimated by interpolated from the elevation of the nodes at either end of the main assuming that the ferrule is located so that the supply pipe runs perpendicular from the main.

- The minimum pressure at the "ferrule" is interpolated from the predicted minimum pressure at the nodes at either end of the main.

- The property elevation is then subtracted from the total head at the ferrule location and any properties with less that 15m pressure was placed on the DG2 register.

We were able to confirm the application of the methodology during our audit of a distribution zone study. We note the following in respect of the criteria used to determine pressures in the distribution system:

- All pressures in the main are relative to OS datum as is the GIS property level information.

- All pressures are relative to ground level and the depth of main below ground need not be considered.

Overall, we conclude that a reasonable method of hydraulic analysis has been applied to establish a baseline level of service pending more detailed investigation of areas at risk.

Pressure Logging Methodology

The Company has undertaken a dedicated programme of pressure logging to determine the reference level of pressure at properties not yet covered by hydraulic models of the distribution system.

We understand that an initial screening exercise was undertaken to identify the critical point in each DMA and compare this with the top water level in the associated service reservoir. Where the resulting pressure was less than 18m the properties were highlighted and the critical point in those DMAs was logged. From this an estimate of the properties in the DMA not receiving the required level of service was derived against the level of properties in the DMA established from the OSNI POINTER data.

We have some reservations about this approach. The initial screening methodology is dependent on assumptions regarding losses in the distribution system. Where pressure logging is carried out, it is unlikely to have occurred when flows were at peak levels. As a result, it is possible that additional properties at risk of low pressure will be identified as the coverage of hydraulic models is increased. Where the two methodologies overlapped there was some correlation – in an example investigated there was a difference of 6 metres between the methodologies at the same point.

Other comments on the methodology

The assessment of reference pressure through modelling and pressure logging provides an indication of the current status of the network. It does not provide any assessment of the work required to address particular issues. For example, no particular assessment has been made of whether simple operational changes might address low pressure in some areas. This might include opening valves which are partially shut, resetting pressure control valves or replacing worn pumps under the asset maintenance programme. It is possible that detailed assessment may result in simple low cost solutions being identified to a number of the problems raised.

NI Water has identified 10,321 properties below DG2 reference level of service. However, the baseline assessment is not supported by any sustained level of complaint from customers. Further investigation will be required to understand the reason for this. We understand that NI Water intends to begin to use information from customer contact to further develop the

DG2 register. The publication of the current numbers indicating that 1 in 75 properties in Northern Ireland are below the reference level of service and the publication of a guarantee service scheme with compensatory payments may result in an escalating level of customer contact.

The baseline analysis was carried out on the models as they existed at a point in time. Since then improvements have been carried out in some distribution zones under both NIWS and NI Water. The models used to determine the reference pressure do not fully reflect these changes. The Company is currently carrying out pressure monitoring in these areas post improvement to confirm whether work carried out has already resolved the low pressure issue. When this is confirmed the properties will be reclassified on the register.

The Company has not identified any allowable exclusions but plan to undertake work to identify whether any exist during 2008-09.

Following our audit of the Company's distribution zone studies we have raised concerns about the use of gross demand factors to scale calibration day diurnal profiles, see Section 17.5. The consequence of this methodology is that the peak demand may be exaggerated and so lower pressures are being predicted in the models which would increase the number of DG2 properties identified.

The use of the models relies on relating predicted pressures in the model to nodes in the Corporate GIS system. Unfortunately the Company GIS system does not maintain unique node IDs at each update and therefore models built with earlier extracts from the GIS can not be directly related to the current GIS. This has resulted in a large number of nodes and hence properties which can not be automatically linked to the models. Since these nodes that cannot be linked automatically they are assigned zero pressure, with the consequence that any related properties return a negative pressure. There are 105,024 properties which fall into this category. These properties have been identified and entered in a separate database. We understand that they will be subject to further investigation in 2008-09 to confirm whether they meet the DG2 level of service

The Company has not provided evidence that the surrogate reference level of service reported is sufficient to provide the reference level of service for all properties taking into account the length and condition of communication pipes and head loss through any meters or other Company fittings. We expect that the surrogate pressure reported against is reasonable for "average properties". However, it is likely that some properties with communication pipes which are longer than average or in a poor condition receive a service lower than reference level and are captured on the DG2 register using the current methodology. Conversely, the use of a surrogate pressure may result in properties with short communication pipe being included on the register when they received better than reference level of service.

The Company's baseline analysis has not made any adjustment for properties served by a common communication pipe. These may receive a lower level of service than indicated by the simple surrogate used.

The analysis using the older distribution zone models has not taken recent rehabilitation works into account in all cases and therefore this could result in reductions to the number of properties on the register following further investigations.

Because of the assumption in the methodologies and the large number of properties under investigation we believe a confidence grade of B4 is appropriate.

The total connected properties at year end reported in Line 1 differ marginally from those reported in Table 7.

3.3 Table 2 - Block B – DG3 Properties Affected by Supply Interruptions

3.3.1 Commentary on the Company's methodology

The Company has provided a detailed description of its methodology in its commentary and the DG3 Level of Service Methodology. From our audit the procedures described in its commentary by the Company appear to be being used and they have disclosed all their assumptions.

OMIS is used as the main tool for recording interruptions to supply. The system was updated for 2007-08 to provide an input screen for entering interruptions information. The system is managed by Operations Services and is networked, although Engineering and Procurement Directorate (E&P) and Customer Services Directorate do not currently have access. Information from the two E&P regions and Customer Services is provided to Operation Services each month on spreadsheets and entered on OMIS.

The procedure requires field engineers to record events on proformas. Information is then entered on OMIS via the input screens at least monthly. In some cases NI Water staff enter the information directly without keeping a paper record. In other cases information is entered from paper records by administrative staff.

Operations Services extract data from OMIS each month and transfer it into a worksheet in the Composite Interruption Data file (the DG3 register). This data is combined with data from Networks and Leakage to create a complete listing.

Checks on the integrity of the data are carried out. For example the warning and start times are compared to reclassify any interruption where the warning time was less than 48 hours or the interruption time was before the planned start time. Overruns of planned and warned interruptions are also identified and staff members are contacted if there are any remaining queries. The spreadsheet is then used to assign interruptions to the various types and durations.

During the audit we examined records contained within OMIS, the extracted data within the Composite Interruption Data file, the spreadsheets provided by E&P and Customer services and the final DG3 register. We followed individual interruptions and saw how the number of properties was recorded. In some cases properties are identified from a manual count off network maps and in other cases are estimated using a GIS polygon. Operation Services queries to E&P and their subsequent answers were viewed.

NI Water also has the Work Planning Ellipse system which is used as to check to the DG3 register. The customer relations centre raises a work request from Rapid-Xtra following a customer complaint, or an automatic request from telemetry, which in turn generates a work order from Ellipse. A reconciliation between Ellipse and OMIS found more records on Ellipse but this was found to be due to jobs not having been properly closed or the fact that a new work order has to be raised for any job which continues after midnight.

Each month the final DG3 register is forwarded to the Networks Functional Manager and E&P Grade 6 for review and approval.

We believe the recording and reporting of DG3 interruptions is competently undertaken and administered. We believe the improved confidence grade from previous years reflects the improved administration and internal audits.

3.4 Table 2 - Block C – Population (Winter)

The estimate of winter population is the total projected population in Northern Ireland plus an allowance for non-resident population in visitor accommodation.

3.5 Table 2 - Block D – DG4 Restrictions on Water Use

The Company has not identified any restrictions on water use in the report year. The Company has advised us that NIWS had not imposed restrictions on water use in the past.

4 TABLE 3 – KEY OUTPUTS – SEWERAGE SERVICE – INTERNAL FLOODING

4.1 Key points

1. The Company is developing its processes for recording and investigating flooding incidents and has limited information on the type and cause of flooding incidents.

2. The Company has completed a report on flooding incidents in the year (Block A). The Company has identified numbers of properties at risk in the 2 in 10 category only. The Company has not completed information on problem status of properties on the at risk registers.

3. The Company has based the number of incidents in the report year on customer contacts in respect of flooding recorded by the Customer Contact Centre. These contacts are not grouped by incident or number of properties affected at source. In the absence of this information, NI Water has applied logical rules based on date and address to group contacts into property flooding events and incidents.

4. In the absence of detailed information on each flooding incident, NI Water has distributed the total estimated number of properties flooded and flooding incidents over Block A in proportion to the average numbers reported for each category in England & Wales in 2006-07.

5. NI Water is working through various sources of historic information of property flooding to establish the risk of flooding. The report of properties at risk in Block B represents progress to date covering 8% of flooding records from historic sources. The properties reported are those which have passed through an initial screening assessment. They have not been subject to further detailed investigation including hydraulic analysis to finally confirm their status. In the main, they are properties which are already included in schemes to resolve the underlying hydraulic problems which cause flooding.

6. The Company is developing new reporting procedures to improve its records of flooding data. However, these will not be come into operation until the introduction of the new networks maintenance contract expected in August 2008. Even then it will take a period of time before the new reporting systems have been proved. It is likely that the reported data in the AIR09 will not be materially better than that reported in AIR08.

7. We recommend that the Company develops its DG5 Level of Service Methodology to provide a clear statement of how each property subject to flooding in the future will be assessed and allocated between the various flooding categories and at risk categories. This would ensure that each property is categorised through a consistent and auditable process.

4.2 Approach to audit

During our audit we:

- Received a copy of the Company's analysis of flooding incidents based on contact information and reviewed procedures for collating the base data.

- Met with Company staff to review the analysis of the data and the population of Tables 3 and 3A.
- Reviewed sources of historic flooding data being used to determine risk of flooding and reviewed a sample of assessments to date.

4.3 Company's DG5 Level of Service Methodology

The Company has submitted a DG5 Level of Service Methodology.

The methodology sets out information on the how the Company will populate the AIR08 report tables. It notes steps the Company will take to identify historic records of flooding and sets out steps the Company will take to determine whether these properties are at risk of flooding.

The DG5 Level of Service Methodology does not provide clear information on how individual flooding incidents will be recorded by the Company and allocated to at risk categories. We recommend that the methodology is developed to provide a clear set of steps which will result in a property being allocated to an at risk category. This might include:

- How the Company will identify whether flooding is internal or external.
- How the Company will determine whether flooding is due to hydraulic overload or other causes.
- How (and when) the Company will seek information to determine the return period of the storm associated with the flooding event.
- If appropriate, how the Company will use a combination of Company of frequency of flooding and associated storm return period to allocate a property to an at risk category pending more detailed investigation.
- When the Company will trigger additional investigations including hydraulic analysis to confirm the at risk status of a property.

For each stage the Company should identify the default allocation in the event of information not being available.

Setting out and following a clear methodology will allow the Company to demonstrate that each property subject to flooding has been categorised in a consistent auditable way.

It would be helpful if this process was captured in a flow chart.

4.4 Table 3 - Block A – DG5 Annual Flooding Summary

4.4.1 Commentary on the Company's methodology

The Company has based its assessment of flooding incidents in the year on the basis of reports of flooding complaints received in the year at the Customer Contact Centre and recorded on the Company's contact system Rapid Xtra.

Flooding events were identified as:

- Sewerage complaint – flooding internal
- Sewerage complaint – flooding external

The contact information includes the date the contact was received. It generally includes a customer reference and a property reference which allows the Company to identify a property address.

The complaint code on Rapid Xtra is used by the Company to distinguish internal and external flooding events. The code is based on the understanding of the contact agent of the customer's complaint. Given that any report of a flooding incident is made in stressed circumstances, the reported location of flooding might not be reliable.

It is possible that some flooding incidents will have occurred as a result of blockages or defects on laterals or private drains which are not the responsibility of NI Water. It is unlikely that these have been excluded from the report.

NI Water has responsibility for sections of laterals and drains which are not the responsibility of similar water and sewerage companies in England & Wales. The Company may wish to address this as a special factor in business plan submissions to the Utility Regulator. To inform this type of assessment, it would be helpful if the Company maintained records which distinguished incidents caused by defects on the element of laterals and drains which it is responsible for from incidents caused by defects on the main sewer.

We recommend that the Company develops its systems to ensure that information included on the flooding register is confirmed by Company staff or its contractors who attend the incident. This would allow the Company to distinguish between different types of flooding in accordance with the reporting requirements. It would allow robust links to be developed between cause and effect which would inform future asset management plans.

The customer contact data used by the Company to develop its flooding reports was abstracted from the Rapid Xtra system monthly and the individual reports combined. We asked the Company to run the same report for the full year. This gave a lower number of contacts than the total of the monthly reports. This suggests that some reports have changed following checks and reviews.

Individual properties subject to internal flooding were identified by concatenating the property address to create an address string. Unique address strings identified as properties subject to flooding in the year (lines 2 and 6).

Information on Rapid Xtra does not generally link individual flooding complaints to incidents. The Company based its report on flooding incidents by:

- Concatenating the first part of the property street name and town to give a street string. All properties reporting flooding at the same time on the same street and any adjacent streets sharing the first part of the street name were recorded as a single incident. The Company was not able to combine reports from adjacent streets which do not share a common street name into a single incident.
- Excluding all reports from the same street occurring within three days of the initial report. This addressed the fact the customer contacts will often include follow up contacts relating to an initial incident.

Severe weather conditions were identified from the Met Office Monthly Summary Reports for Northern Ireland. These text reports provide a brief summary of weather in Northern

Ireland by month and highlight days with heavy rainfall. NI Water identified 64 days with heavy rain which it related to severe weather. The Company identified the number of flooding incidents on these days. It then deducted the average number of flooding incidents on others days to reflect the fact that severe weather on any one day might not affect the whole of Northern Ireland.

The reporting requirements indicate that severe weather incidents should only include rainfall events having a return period that is greater than once in twenty years. We are not convinced that storm events having a return period that is greater than once in twenty years will occur on 64 days in any one year. The percentage of flooding incidents attributed to severe weather (60%) is greater than that reported in England & Wales in 2006-07 (31%). The Company is considering its policy on obtaining storm return period assessments for individual flooding incidents based on Met Office reports or radar tracking.

4.4.2 Commentary on individual line entries including confidence grades

The Company has allocated a confidence grade of D6 to reported data on flooding incidents. We believe that this is a reasonable assessment of the quality of reported data which is based on:

- customer contact data which have not been verified by Company investigations;
- logical data rules rather than detailed investigation to group properties by incident;
- general meteorological reports to identify severe weather;
- England & Wales average reports to distribute incidents by cause;
- incomplete historic flooding records to identify repeat flooding incidents.

Line 1 The reported number of domestic properties connected to the sewerage system is based on 84% of household properties connected to the water service (Table 7 Line 7) and 89% of the non-household properties connected to the water service (Table 7 Line 11). The ratios used are consistent with those used in the Scheme of charges for 2007-08. The numbers do not reconcile to the numbers of properties reported in Table 13 where a more specific assessment of void properties is made based on LPS data. We recommend that this is reviewed for subsequent returns and a consistent set of property data reported.

The reported data includes household and non-household properties, assuming that non-households connected to the sewerage system have a domestic component. This is consistent with reports in England & Wales.

The reported figures are based on a year average. The reporting requirements ask for year end figures to be reported.

We consider a B3 confidence grade to be appropriate until a consistent set of property data is available.

Line 2 Internal property flooding was identified from flooding complaints recorded on the customer contact system.

Individual properties subject to internal flooding were identified by concatenating the property address to create an address string. Unique address strings identified as properties subject to flooding in the year (lines 2 and 6).

561 properties were identified in this way which were allocated between Lines 2 and 6 in proportion to average data reported by the ten water and sewerage companies in England & Wales for 2006-07.

Line 3 Internal property flooding was identified from flooding complaints recorded on the customer contact system.

Flooding incidents were identified by grouping internal flooding complaints by street and excluding repeat contacts within a three day period.

589 internal flooding incidents were identified which were distributed across Lines 3, 8, 9 and 10 in proportion to average data reported by the ten water and sewerage companies in England & Wales for 2006-07.

Line 4 Flooding incidents related to severe weather were allocated from Met Office Monthly Summary Reports for Northern Ireland. The Company matched days reported with heavy rain to severe weather. On balance, we believe that this is likely to over report incidents due to severe weather.

Line 5 The Company's records do not allow it to identify uninhabited cellars.

Line 6 See report on Line 2 above.

Line 7 The Company's report of properties which have flooded more than once in the last 10 years (other causes) is based on a comparison of internal flooding incidents in the report year against historic flooding records over the last 10 years. The matching properties were allocated to other causes in proportion to average data reported by the ten water and sewerage companies in England & Wales for 2006-07.

Line 8-10 Flooding incidents (other causes). See report for Line 3 above.

Line 11 The Company's records do not allow it to identify uninhabited cellars.

4.5 Table 3 - Block B – DG5 Properties on the At Risk Register

4.5.1 Commentary on Company methodology

The Company is developing its at risk register following the methodology outlined in its DG5 Level of Service Methodology

The Company does not have detailed historic information on flooding incidents. In the absence of detailed information the Company has been collating and investigating various sources of data which include information on sewer flooding. This includes:

- A previous Customer Enquiry Management System (CEMS). This provides data on customer contacts over the period March 2004 to November 2006. The contacts are tagged as internal or external reports.

- A previous work planning system which was in operation from 1997 to 2003. Work orders are categorised allowing records relating to flooding to be identified. The data does not cover all areas of Northern Ireland. The reported data does not distinguish between internal and external flooding.

- A work planning system covering the period April 2005 to March 2006. The reports are flagged as internal or external and the cause of flooding is identified.

- Information from the Central Claims Unit covering claims for flooding against Northern Ireland Water Service. The reports cover a period 1983 to February 2007, although few records predate 1990.

- An NIWS Eastern Division flooding database covering the years 2000-01 to 2002-03. The data is thought to be internal flooding only. The cause of flooding has been identified.

- A drainage area study data base recording properties subject to flooding identified through drainage area studies.

The Company has yet to capture data from Rapid Xtra from November 2006 to March 2007.

These data sets used are not comprehensive, either individually or as a combined set. It is likely that some projects at risk of flooding have not been recorded to date. These will be exposed as the Company undertakes further modelling work to understand its network and resolve problems and as further reports of flooding are received.

NI Water has collated the data contained in these source systems or documents. NI Water has noted that the total number of records identified through this process are:

- Records internal property flooding 2,336

- Records of external property flooding 27,894

These records are being investigated to determine whether the associated properties are likely to meet the criteria of the various DG5 at risk registers. Once a property is determined as DG5 “reportable” it will be included in a DG5 at risk category.

Following this initial screen, the Company proposes to investigate other properties through a process of questionnaires, interviews with field staff and interviews with property owners.

This process will result identify properties considered to be “reportable” to a DG5 at risk register. Further detailed investigation may be required, including hydraulic analysis, to confirm the risk of flooding.

Investigations to date have mainly focused on sewerage projects in the current capital works programme. Sewerage projects are being inspected and projects to resolve sewer flooding identified. The development of these projects has included an assessment of flooding history and flooding risk which is used to identify properties at risk of flooding. It is these properties that are identified in Line 12.

4.5.2 Commentary on individual line entries including confidence grades

Lines 12-14 The 80 properties reported are those which have been determined as DG5 reportable through the process described above, mainly from inspection and assessment of current capital schemes.

The Company is currently working through a backlog of historic information and the number of properties at risk is expected to increase as this work progresses.

5 TABLE 3A - KEY OUTPUTS – SEWERAGE SERVICE – EXTERNAL FLOODING

5.1 Key points

1. The Company's methodology follows that adopted for Table 3 – internal flooding. In this section we have reproduced relevant key points but not the detailed report which can be found under Section 4 above.

2. The Company is developing its processes for recording and investigating flooding incidents and has limited information on the type and cause of flooding incidents.

3. The Company has completed a report on flooding incidents in the year (Block A). The Company has identified numbers of properties at risk in the 2 in 10 category only. The Company has not completed information on problem status of properties on the at risk registers.

4. The Company has based the number of incidents in the report year on customer contacts in respect of flooding recorded by the Customer Contact Centre. These contacts are not grouped by incident or number of properties affected at source. In the absence of this information, NI Water has applied logical rules based on date and address to group contacts into property flooding events and incidents.

5. In the absence of detailed information on each flooding incident, NI Water has distributed the total estimated number of properties flooded and flooding incidents over Block A in proportion to the average numbers reported for each category in England & Wales in 2006-07.

6. NI Water is working through various sources of historic information of property flooding to establish the risk of flooding. The report of properties at risk in Block B represents progress to date covering 0.8% of properties represented in historic sources. The properties reported are those which have passed through an initial screening assessment. They have not been subject to further detailed investigation including hydraulic analysis to finally confirm their status. In the main, they are properties which are already included in schemes to resolve the underlying hydraulic problems which cause flooding.

7. The Company is developing new reporting procedures to improve its records of flooding data. However, these will not be come into operation until the introduction of the new networks maintenance contract expected in August 2008. Even then it will take a period of time before the new reporting systems have been proved. It is likely that the reported data in the AIR09 will not be materially better than that reported in AIR08.

8. We recommend that the Company develops its DG5 Level of Service Methodology to provide a clear statement of how each property subject to flooding in the future will be assessed and allocated between the various flooding categories and at risk categories. This would ensure that each property is categorised through a consistent and auditable process.

6 TABLE 4 – KEY OUTPUTS – CUSTOMER SERVICE – 1

6.1 Key Points

1. The Company has outsourced customer contact and billing to Crystal Alliance with new systems introduced from October 2006. The reported data is mainly from Crystal Alliance systems.

2. Crystal Alliance has a well developed system of managing and reporting responses to billing complaints. NI Water has well developed processes for checking and monitoring the work carried out by Crystal Alliance and the reports prepared by Crystal Alliance. There is alignment between the performance measures in the contractual service level agreement and the AIR08 reporting measures.

3. There has been a material increase in the number of billing contacts recorded in the year associated with issues related to billing which are outlined in the Company's commentary. Despite the increase in volume, the performance in respect of time taken to deal with a complaint has improved.

4. The year end report relates to contacts closed by 31 March, including contacts where a holding response was issued by 31 March which had been closed by the end of May when the AIR08 data was compiled. Some holding responses issued by 31 March remained open at end of May and these contacts were not included in the return. We recommend that the Company considers how these responses will be reported in subsequent years. We recommend that the Company considers why holding responses remain open after two months and whether it is reasonable to eventually report these as closed at the initial holding response date.

5. Mail received after 14:00 is logged as received the next working day.

6. Response times are calculated to the time the contact is closed. This may be before correspondence dependent on a print run is issued.

7. Billing contacts include contacts in respect of domestic septic tank emptying which the Company does not include in its regulated business activities.

6.2 Approach to audit

During our audit we:

- Met with Company staff responsible for managing the contract for customer billing and contact.

- Met with staff in Crystal Alliance responsible for managing billing contacts to review the systems and processes used to manage billing contacts and prepare the data reported for AIR08.

- Selected a random sample of billing contacts which were checked in detail to provide an understanding of how the Company's processes were implemented and the quality of the resulting reports.

During our audit we followed an audit trail to check 20 contacts selected at random to confirm that the methodology described by the Company was followed and to test the quality of the information reported in the AIR08. We do not consider the size of the sample to be statistically valid. On simple binomial theory, if 95% of the Company's records are accurate there is a better than evens chance that the sample will include one record which has not been completed accurately.

Our audit of properties and populations in described in our report on Table 7.

6.3 DG6 Level of Service Methodology

The Company has provided a written Level of Service Methodology.

The introduction to the reporting requirements sets out a layout for the DG6 Level of Service Methodology. The Company has not followed the required layout. The Company has not included some of the detailed information required by the reporting requirements. In some instances the methodology refers to internal procedures not reproduced in the methodology.

We have reviewed the methodology and believe that it is a reasonable statement of the Company's approach. Our sample audits indicate that the Company's procedures comply with the methodology with the following exceptions:

- Mail received after 14:00 is logged as received the next working day.
- Response times are calculated to the time the contact is closed. This may be before correspondence dependent on a print run is issued.

6.4 Table 4 - Block A – DG6 Response to Billing Contacts – General

6.4.1 Commentary on Company methodology

The Company has outsourced customer contact and billing services to Crystal Alliance. All billing contact data reported in AIR08 has been generated by Crystal Alliance.

Customer billing contact information is managed through customer contact and billing system Rapid Xtra.

Customer correspondence received by Crystal Alliance is managed centrally. Correspondence is opened and date stamped. At this point, correspondence is allocated between various categories including correspondence relating to DG6 (billing contact) and DG7 complaints. Correspondence is then scanned and registered on the Rapid Xtra. It is routed through a series of mail boxes to be allocated for action by managers.

In a limited number of cases correspondence incorrectly allocated at first will be rerouted by staff dealing with it to the correct reporting category. Examples of this were noted during our audit.

Telephone contacts relating to billing are recorded on Rapid Xtra and routed to the billing contact team.

In general, correspondence, including e-mails received up to 14:00, are registered as received on that day. Correspondence received after 14:00 is recorded as received the following day.

During our audit we noted that correspondence issued by the Company, including bills, which had been annotated and returned by customers were treated as billing contacts.

Contacts are closed on the day a response is issued by the contact team. Internal post trays are cleared through the day, and particularly at day end, to ensure that responses are issued on the day a contact is closed. An exception is where a bill is issued in responses to a billing contact. Bills are issued by a sub-contractor to Crystal Alliance who will receive an instruction to issue a new bill on the day the contact is closed. We understand that these bills will be issued the following day. We recommend that NI Water investigates this to understand when a response is finally issued and add further time to the time to respond for relevant correspondence.

The Company can issue a holding response. If a holding response is issued, the Company will backdate the closed date to the date of the holding response and report the time to respond based on when the holding response was issued.

The Company has standard actions and standard scripts which are available to be used to ensure that holding response are substantive. In general, holding responses set out specific actions and a timescale. We noted limited issues in the quality of holding responses from our sample audits which are summarised below.

The Company does not use sampling techniques to estimate either the number of contacts responded to or the response time in the year.

The Company reports the number of contacts in the year as the number of contacts closed in the year. The approach to holding responses may result in some contacts not being reported in any Annual Information Return. The report used to generate the AIR08 was run at end May 2008. At this time some contacts where a holding response was issued prior to 31 March 2008 remained open and were not counted in the current year's return. Once they are closed, the close date will be set at the date of the holding response (in the 2007-08 report year) and they will not be picked up in the AIR 09. We recommend that the Company reviews this approach to ensure that a complete report of all contacts is provided in subsequent years.

The Company tracks response times. A key management metric is the number of days contacts have remained open. Attention is focused on contacts which have been which remain open close to five days to find out why they have not been addressed and ensure that any issues are resolved.

Based on our review of a sample of 20 records we noted the following:

- The Company uses log only responses where a customer has provided information and not further Company action is necessary. We noted the use of log-only where someone had contacted in response to a bill stating that they were not responsible for the supply. We suggest that in these circumstances the customer might reasonably expect a response from the Company accepting that the Company agreed. We recommend that the Company reviews the use of log-only responses to confirm that they are only used in appropriate circumstances.

- The Company uses holding responses which informs a customer of further action needed to investigate and properly respond to a contact. In one example we noted a holding response had been issued informing a customer that they would be contacted to arrange a date to read a meter. No time scale was given for this action. We found that other holding responses covered in our sample did include a timescale.

- For some contacts we found the use of repeat holding responses with an initial holding response giving a timescale for action and subsequent holding responses amending that timescale. We recommend that the Company monitors the use of repeat holding responses and draws lessons from why timescales have to be extended. We ask that the Utility Regulator confirms whether a contact should be reported as closed on the date of the initial holding response where the Company has not been able to complete the actions on the holding response within the stated timescale.

- We noted one e-mail received during working hours which had been dated as logged on the next day. The Company noted its policy of recording contacts received after 14:00 as received the next day.

- The time taken to respond had been correctly calculated on the basis of working days, not including day of receipt and excluding public holidays.

We note the Company and Crystal Alliance have actively managed the reporting processes to improve the quality of information. Some of the issues identified above reflect contacts selected from the early in the year.

6.4.2 Commentary on individual line entries including confidence grades

Lines 1 to 5 The numbers of contacts have been derived from internal reports prepared from Rapid Xtra.

Based on a review of the overall procedures our sample audits we believe that a B2 confidence grade is reasonable despite noting that some holding responses in the year remain open at the time the reports the data is based on were run.

6.5 Table 4 - Block B – Connected Properties

We comment on the companies records of connected properties in our report on Table 7

We have not been able to reconcile the Company's reported figures to data reported in Tables 7 and 13. The total number of properties reported as connected to the water supply is 800,061 compared with 797,712 in Table 7. The total number of properties reported as connected to the sewerage systems is 664,479, compared to 697,875 reported in Table 13.

7 TABLE 5 – KEY OUTPUTS – CUSTOMER SERVICE – 2

7.1 Key Points

General

1. The Company has outsourced customer contact and billing to Crystal Alliance with new systems introduced from October 2006. The data reported for DG7, DG8 and DG9 is mainly taken from Crystal Alliance systems.

2. Crystal Alliance has a well developed system of managing and reporting responses to billing complaints. NI Water has well developed processes for checking and monitoring the work carried out by Crystal Alliance and the reports prepared by Crystal Alliance. There is alignment between the performance measures in the contractual service level agreement and the AIR08 reporting measures.

3. Mail received after 14:00 is logged as received the next working day.

4. Contacts reported include contacts in respect of domestic septic tank emptying which the Company does not include in its regulated business activities.

Special Assistance Register

5. The Company launched a special assistance register as part of the *Priority Services for Domestic Customers* Code of Practice in 2007-08 and is in the process of populating the register. We understand that the Company was not required to report on the Special Assistance Register in the report year.

7.2 Approach to Audit

During our audit of DG7, DG8 and DG9 we:

- Met with Company staff responsible for managing the contract for customer billing and contact.
- Met with staff in Crystal Alliance responsible for managing customer contact and billing records to review systems and processes used to manage contacts and billing records and prepare the data reported for AIR08.
- Selected a random sample of customer contacts and billing records which were checked in detail to provide an understanding of how the Company's processes were implemented and the quality of the resulting reports.

During our audit we followed an audit trail to check 20 contacts each for DG7, DG8 and DG9 selected at random to confirm that the methodology described by the Company was followed and to test the quality of the information reported in the AIR08. We do not consider the size of the sample to be statistically valid. On simple binomial theory, if 95% of the Company's records are accurate there is a better than evens chance that the sample will include one record which has not been completed accurately.

7.3 Level of Service Methodologies

The Company has provided written levels of service methodologies for DG7, DG8 and DG9.

The introduction to the reporting requirements sets out a layout for the DG7, DG8 and DG9 Level of Service Methodologies. The Company has not followed the required layout. The Company has not included some of the detailed information required by the reporting requirements. In some instances the methodologies refer to internal procedures not reproduced in the methodology.

We have reviewed the methodology and believe that it is a reasonable statement of the Company's approach. Our sample audits indicate that the Company's procedures comply with the methodology with the following exceptions:

- Mail received after 14:00 is logged as received the next working day.

7.4 General Commentary on Procedures

Much of our audit focuses on the procedures used to generate the reported numbers supported by sample audits to confirm that individual contacts had been allocated to the correct reporting category.

However, the quality of the data is dependent on the quality of the actions of individual staff receiving and responding to each contact and the actions taken to record them. Through our sample audits we noted that:

- Crystal Alliance had established and detailed procedures across it business to define how contacts should be responded to and how contacts should be recorded.

- Staff training was provided. Staff training records were maintained and available for inspection. These provided a clear record of the training provided and the training not yet provided. The content of training courses were reviewed on the basis of feedback received to ensure that they addressed relevant issues at an appropriate level.

- Managers monitor the work of individual staff by call listening or review of written responses.

- Individual staff development plans are prepared based on monitor and review sessions to ensure that weaknesses are addressed.

Overall we concluded that there was a considered and dedicated approach to staff training and development to ensure a good quality of response to customers.

7.5 Table 5 - Block A – DG7 Response to Written Complaints

7.5.1 Key points

1. Reported data comes from Crystal Alliance systems.

2. During part of the report year, complaints received and responded to by the Chief Executive's office were logged and monitored separately. The

Company has taken account of these written complaints in the calculation of percentage dealt with within 10 working days but the reported percentage should read 90.60.%. The Company has not been able to confirm how many were responded to in more than 20 working days.

3. The year end report relates to contacts closed by 31 March, including contacts where a holding response was issued by 31 March which had been closed by the end of May when the AIR08 data was compiled. Some holding responses issued by 31 March remained open at end of May and were not included in the return. We recommend that the Company considers how these responses will be reported in subsequent years. We recommend that the Company considers why holding response remain open after two months and whether it is reasonable to eventually report these as closed at the initial holding response date.

4. There has been an increase in the number of written complaints in the year which NI Water attributes to significant flooding incidents in the year and notification to customers that free septic tank emptying would be withdrawn.

7.5.2 Commentary on Company methodology

The Company has outsourced customer contact and billing services to Crystal Alliance. In the main, written correspondence is initially received and processed by Crystal Alliance. Customer contact information is managed through customer contact and billing system Rapid Xtra.

During part of the report year, complaints received and responded to by the Chief Executive's office were logged and monitored separately. These have not been included in the reported data. 484 additional complaints should be added to the reported figures. NI Water reports that 235 were answered within 10 working days. However, the Company has not been able to confirm how many were responded to in more than 20 working days.

From December 2007, Chief Executive mail has been registered and monitored through Rapid Xtra. Prior to June 2008, procedures adopted for processing Chief Executive mail resulted in a high proportion of responses taking more than 10 days. From June 2008 all mail will follow the same processes which should ensure that a higher proportion of response times are within 10 days.

NI Water also maintains a separate customer service escalation team which deals with more severe or repeat complaints which cannot be dealt with within the normal operating rules of Crystal Alliance. Complaints dealt with by the escalation team continue to be processed by Crystal Alliance through its Rapid Xtra systems subject to the same processes and rules of reporting as other complaints and are included in the reported figures.

Customer correspondence received by Crystal Alliance is managed centrally. Correspondence is opened and date stamped. At this point, correspondence is allocated between various categories including correspondence relating to DG6 (billing contact) and DG7 complaints. Written billing complaints are categorised as DG7 and reported under this category only.

Correspondence is then scanned and registered on the Rapid Xtra. It is routed through a series of mail boxes to be allocated for action by managers. Where appropriate, complaints which meet the internal reporting thresholds are routed to the NI Water escalation team for action.

In a limited number of cases correspondence incorrectly allocated at first will be rerouted by staff dealing with it to the correct reporting category.

In general, correspondence, including e-mails received up to 14:00, are registered as received on that day. Correspondence received after 14:00 is recorded as received the following day.

Contacts are closed on the day a response is issued by the contact team. Internal post trays are cleared through the day and particularly at day end to ensure that responses are issued on the day a contact is closed.

The Company can issue a holding response. If a holding response is issued, the Company will backdate the closed date to the date of the holding response and report the time to respond based on when the holding response was issued.

The Company has standard actions and standard scripts which are available to be used to ensure that holding response are substantive. In general, holding responses set out specific actions and a timescale. We noted limited issues in the quality of responses from our sample audits which are summarised below.

The Company does not use sampling techniques to estimate either the number of contacts responded to or the response time in the year.

The Company reports the number of contacts in the year as the number of contacts closed in the year. The approach to holding responses may result in some contacts not being reported in any Annual Information Return. The report used to generate the AIR08 was run at end May 2008. At this time some contacts where a holding response was issued prior to 31 March 2008 remained open and are not counted in the current year's return. Once they are closed, the close date will be set at the date of the holding response (in the 2007-08 report year) and they will not be picked up in the AIR 09. We recommend that the Company reviews this approach to ensure that a complete report of all contacts is provided in subsequent years.

The Company tracks response times. A key management metric is the number of days contacts have remained open. Attention is focused on contacts which remain open close to five days to find out why they have not been addressed and ensure that any issues are resolved.

All responses to written complaints are reviewed by a quality control team before despatch to ensure that the response deals with all issues raised in the complaint and that internal procedures have been followed.

Based on our review of 20 records, we noted the following:

- Some written complaints responded to in the report year were made in prior years. We understand that this is a legacy issue of open complaints from NI Water Service. We understand that open complaints were identified and an attempt made to determine whether they had received a substantive response in the past. If they had received a substantive response in the past, they were closed but not reported. Where the Company could not determine that there had been a substantive response, the complaints were responded to and including in the current year's statistics.

- One written complaint had two date stamps. We understand that it had been date stamped on receipt, sent to the NI Water claims handling unit and date stamped again two days later on return from the claims handling unit. It was registered in Rapid Xtra under the later date.

- For some contacts we found the use of repeat holding responses with an initial holding response giving a timescale for action and subsequent holding responses amending that timescale. We recommend that the Company monitors the use of repeat holding responses and draws lessons from why timescales have to be extended. We ask that the Utility Regulator confirms whether a contact should be reported as closed on the date of the initial holding response where the Company has not been able to complete the actions on the holding response within the stated timescale.

- In general, the initial correspondence and the response are held on Rapid Xtra, referenced to the contact. In some cases where the Company has responded by e-mail, the contact records notes that a response has been made and a contact close date. The e-mail response is held in a separate email outbox. During our audit the Company was able to locate these responses but this could take time. The record of the response would not be readily available to contact staff if the customer followed up the complaint at a later date.

7.5.3 Commentary on individual line entries including confidence grades

Lines 1 to 5 The Company's report does not include 276 written complaints received and responded to by the Chief Executive's office up to November 2007.

Including this data would increase the total number of written complaints to 2640 with 2392 (90.6%) dealt with within 10 working days. The Company has not identified the number of these complaints dealt with within more than 20 working days.

The B2 confidence grade reported by the Company relates to the reported data. Taking account of the data excluded from the report, we recommend confidence grades as follows:

- Lines 1 and 2 C4
- Line 3 B2
- Lines 4 & 5 D6

7.6 Table 5 - Block B – DG8 Bills for Metered Customers

7.6.1 Key points

1. NI Water is still working to cleanse data on metered accounts. The reported data for the report year includes all meters registered on the NI Water billing systems. These continue to include categories of meters which are not supply meters or are not subject to billing for other reasons. For example: metered supplies to NI Water sites, free supplies and test meters. We recommend that once these are identified and confirmed they should not be include in the DG8 report. These meters are included in the numbers of customers meters unread for two years and the number of customers receiving no bill during the year.

2. In the report year the Company had a policy of not billing metered customers taking less than a threshold volume of 200m3 (the Domestic

Allowance). These customers are a significant proportion of metered customers receiving no bills in the year.

7.6.2 Commentary on Company methodology

The Company has outsourced customer contact and billing services to Crystal Alliance.

The Company manages meter reading in-house. Once meters are read, the results are passed to Crystal Alliance which processes and issues bills and manages cash collection.

The Company's information on metered accounts was initially transferred from the Northern Ireland Water Service Hi Affinity billing systems. The Company is working through an on-going process of cleansing and improving its metered account information. We understand that the report of metered accounts in Table 5 includes a number of meters which should be excluded from a report on customers or where there remains doubt as to whether the account serves a customer. In particular, the total number of metered accounts includes:

- NI Water meters. These are metered supplies to NI Water treatment works and other sites for which no bill is issued.
- Free supplies. These are flagged on the NI Water billing system and are thought to relate to supplies where a legal obligation has been created in the past to provide a free supply. NI Water is investigating these accounts to determine whether a legal right to a free supply continues to exist.
- Test meters. These are as flagged on the NI Water billing systems. The flag indicates that account is not billable. NI Water is investigating these meters to determine what they are for and whether the supply should be billed.

We believe that these types of meters are a major part of the metered accounts receiving no bills during the report year.

During the report year, the Company did not bill customers where the consumption fell below The Domestic Allowance of 200m3. In these circumstances "nil" bills are not issued. Again, we believe that this contributes to the high number of accounts which did not receive a bill in the year.

The Company's report of metered accounts excluded from the DG8 indicator is based on its records which relate a metered account to a customer. The Company procedures include a test to identify properties which have been occupied (have a customer identified) for less than 6 consecutive months in the report year. In our limited sample audit we were able to confirm that metered accounts excluded from the DG8 indicator did not have customers recorded for six consecutive months.

The reported data is based on a report generated from the billing system on 31 March 2008. We asked for the report to be run during the audit. This generated marginally different numbers (typically less than 0.5% of the reported data). We recommend that the Company investigates why the report generates marginally different numbers at different times.

7.6.3 Commentary on individual line entries including confidence grades

Line 6

The number of metered accounts includes NI Water meters, test meters and free supplies. These types of accounts are deemed to be no billable and are a major part of the accounts reported in lines 11 and 12.

Because the reported figure includes accounts which may not be billable, we recommend a confidence grade of C4 until the data is further cleansed and limited to customer accounts.

Line 7

Metered accounts excluded from the indicator are based on customer information linked to each metered account. The report is based on properties not occupied for six consecutive months in the report year.

Metered accounts excluded from the indicator may include metered supplies which are not serving customers. We recommend a confidence grade of C5 until the data is further cleansed and limited to customer accounts.

Line 8 and 9

The number of metered customers billed is taken from reports generated from the billing system. Limited sample audits confirmed that properties included in this report had bills issued on meter readings.

The additional properties with bills based on customer readings only may also have been read by the Company in the year but the bill issued on the customer estimate only.

We believe that the confidence grade of A2 is appropriate for both lines.

Line 10

Estimated bills are prepared where:

- The Company has been unable to read the meter in the year.
- Where there is some dispute over the account (say a claim that a supply pipe is leaking) and the Company has estimated a bill based on prior consumption pending resolution of the issue.

We believe that a confidence grade of A2 is reasonable for the reported data.

Line 11

We believe that a major part of the accounts which did not receive a bill in the year relate to:

- A range of metered supplies which the Company does not bill and may not be billable including: NI Water supplies, free supplies and test meters.
- Supplies which did not reach the threshold consumption of 200 m3 (the Domestic Allowance) in the report year below which it was Company policy not to bill for the supply.

In subsequent years we would expect this number to decline as the Company:

- Has amended its policy and will bill all metered supplies irrespective of the volume taken.
- The Company cleanses its billing records and identifies billable customer accounts from other types of meters read.

Accounts with no bills issued in the last year include a significant number of metered accounts which might not serve customers. We recommend a confidence grade of C5 until the data is further cleansed and limited to customer accounts.

Line 12 The line definition refers to accounts not billed in the last two years.

Accounts with no bills issued in the last two years include a significant number of metered accounts which might not serve customers. We recommend a confidence grade of C5 until the data is further cleansed and limited to customer accounts.

7.7 Table 5 - Block C – DG9 Telephone Contact

7.7.1 Key Points

1. NI Water has published a limited set of standard contact numbers to route customer contact to the Customer Relations Centre. Only calls answered at the CRC are included in the return.

2. Telephone contact data is produced by two recognised call management systems:

   - "Call Media" which monitors and routes calls received.
   - "Call Master" which monitors the incoming lines and is used to confirm when all lines are busy.

3. The response to telephone contacts is recorded on Rapid Xtra, a software system which includes customer contact management and billing systems.

4. Procedures and guidance are in place for contact response which include: the form of response; appropriate response and interaction with customers; lines to follow in response to standard queries; and, routes for forwarding contact information and requests to appropriate NI Water staff.

5. Crystal Alliance operates defined quality control procedures relating to call handling including trend monitoring and analysis to schedule resources, staff training in detailed procedures and sample listen-in checks on selected calls to assess quality.

6. NI Water operates scrutiny and oversight of the activity, performance and quality of service provided by Crystal Alliance through:

   - Contract management through the Customer Services Contract office relating to activities and payments.
   - Performance and quality management through the Customer Service office.

These activities include sample monitoring of live telephone calls and the review of selected response to correspondence to test the quality of service provided. These sample audits are formally scored to provide a performance measure for contractual payment.

7. Telephone complaints are assessed by the type of contact rather than the tone of contact. Contacts relating to a failure in NI Water's service (for example discoloured water or flooding) are recorded as complaints.

8. The reported number of calls and number of call abandoned excludes calls received outside the hours published for the individual lines.

7.7.2 Approach to Audit

During our audit we:

1. Reviewed the Company's DG9 Level of Service Methodology.

2. Held an initial introduction meeting with Crystal Alliance to understand methods used to record and manage telephone calls and confirm data which could be made available to support the return.

3. Reviewed published contact phone numbers and operational times.

4. Requested daily profiles of calls received, calls abandoned and telephone complaints over the year.

5. For the sample contacts considered in the audit, checked the contact types on Rapid Xtra, including whether the call was deemed to be a complaint or not, against the record of the telephone contact.

6. Called the "waterline" number to confirm that the timing and duration of the call was properly recorded on Call Media.

7. Listened to a limited sample of calls to check the duration and content of the call as recorded on Rapid Xtra.

During our audit we followed an audit trail to check 20 contacts selected at random to confirm that the methodology described by the Company was followed and to test the quality of the information reported in the AIR08. We do not consider the size of the sample to be statistically valid. On simple binomial theory, if 95% of the Company's records are accurate there is a better than evens chance that the sample will include one record which has not been completed accurately.

7.7.3 Commentary on the Company's Methodology

The Company has outsourced customer contact and billing services to Crystal Alliance. The reported figures are generated from reports from Crystal Alliance systems.

Contact Numbers

A limited number of contact numbers are published by the Company including the:

- "Waterline" contact number for general inquiries, emergencies and complaints;
- "Leakline" contact number to report a leak;
- a billing contact number for billing queries; and

- specific campaign numbers for specific types of complaints.

During our audit we reviewed contact numbers published by the Company on the internet, Company correspondence, Company bills, Company information leaflets, in local telephone directories and Company vehicles and offices. We found that a consistent set of contact numbers are readily available and are well publicised.

We understand that all calls on these numbers are routed to Crystal Alliance. Calls are dealt with directly regardless of whether they are received on the "correct" contact number. Internal systems allow calls to be routed to available staff best qualified to deal with that type of inquiry.

Each contact number has specific opening times which are widely published. Calls received on individual lines outside published hours are not answered. These calls are not included in the report of calls received or calls abandoned.

All lines busy

All line busy is only recorded when a customer receives an engaged tone. This is recorded on Call Master.

We understand that the Company has 240 lines available into the call centre in anticipation of the volume of work required to support the introduction of domestic customer billing. With the deferral of domestic customer billing, the level of calls is greatly below anticipated levels and the limiting factor on the operation is more likely to be the availability of agents to answer the call (resulting in a call being abandoned) rather than all lines busy.

We understand that the Company has the ability to switch on additional lines into the call centre if that is required.

Call recording and routing

A key control point in the accuracy of the information report in the AIR08 is the accuracy of the data on Call Media and the correct reporting and allocation of this data for the AIR08 return. We understand that:

- There are no specific tests on the numbers of calls reported on Call Media.
- Crystal Alliance relies on the system to accurately record the information. It relies on its experience of call profiling, call management and general quality assurance checks and reviews to give confidence in these results.
- NI Water does not carry out any tests to confirm the accuracy of the reported numbers.
- No audit calls are made to the system to provide a test for future audits by NI Water or other bodies.

During our audits we:

- Called the Waterline number. We were able to confirm that the time, duration and whether or not the call was abandoned was correctly recorded on Call Media.

- Obtained a report of the number of calls received and calls abandoned throughout the year. We were able to reconcile this report against the total numbers reported in the AIR08 tables. We observed reasonably consistent profiles of calls throughout the year and fluctuations in numbers consistent with weekends and public holidays.

On the basis of these tests and observations we believe that the reported number of telephone contacts and calls abandoned is reasonable.

Call answering

Calls are initially answered by a recorded message which welcomes the caller to NI Water. During the recorded message, calls are automatically routed to staff to be answered. The routing is generally to staff available with preference given to staff with particular training in particular types of contact based on the phone number the call is received on.

Calls are recorded as abandoned if the caller rings off before the end of the recorded message.

Crystal Alliance management and quality control

Crystal Alliance management and quality control includes staff training, regular call listening and individual staff development described in Section 7.4 above.

Not all calls are logged on Rapid Xtra. Crystal Alliance monitors the number of calls received against the number of contacts on Rapid Xtra. This is done for individual staff. The Company seeks to explain the difference between the number of calls received and calls logged. This has been covered in staff development with an aim to ensure that as many calls as possible are recorded on the contact system.

NI Water management and quality control

In addition to general contact management and reporting, NI Water undertakes quality checks on the service provided through regular call listening using a formal scoring system. This mirrors the internal scoring systems adopted by Crystal Alliance and allows the Company to compare its assessment of performance against internal monitoring by Crystal Alliance. This allows the Company to check on performance against current contract standards and identify any areas requiring improvement.

Identifying complaints

Telephone complaints are assessed by the type of contact rather than the tone of contact. Contacts relating to a failure in NI Water's service (for example discoloured water or flooding) are recorded as complaints.

Sample Audits

During our audit we reviewed the 20 records of telephone contacts on Rapid Xtra and listened to a small sample of recordings of telephone contacts. Based on these records we noted the following:

- Complaints were identified by type of contact relating to some failure in the service provided by NI Water as opposed to the tone of the conversation.

- One recording listened to relating to a complaint had not been recorded on Rapid Xtra.

7.7.4 Commentary by Line including Confidence Grade

The Company reports a B2 confidence grade for all data reported in this section. We suggest that an A2 confidence grade would be appropriate for calls received and call satisfaction handling. We suggest that a B3 confidence grade would be appropriate for total telephone complaints pending resolution of work by Crystal Alliance to maximise the number of contacts relating to service issues recorded on Rapid Xtra.

Line 13 Total calls received on customer contact lines are the calls received at the customer contact centre on published customer contact line during published hours. It includes calls received for individual NI Water staff on these lines which are forwarded by Crystal Alliance.

Line14 The Company reports no times when all lines were busy.

Line 15 Abandoned calls are calls abandoned by customers before the end of the recorded message which answers calls received at the customer contact centre.

Line 16 Call handling satisfaction is reported carried out by an independent research Company (McCallum Layton) on behalf of the UK water industry.

7.8 Table 5 - Block D – Special Assistance Register

The Company launched a special assistance register as part of the Priority Services for Domestic Customers Code of Practice in 2007-08 and is in the process of populating the register. We understand that the Company was not required to report on the Special Assistance Register in the report year

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8 TABLE 5A – KEY OUTPUTS - CUSTOMER COMPLAINTS DATA FOR GCCNI

8.1.1 Key Points

1. The number of written complaints reported in Table 5A reconciles to the Company's DG7 report in Table 5.

2. During part of the report year, complaints received and responded to by the Chief Executive's office were logged and monitored separately. NI Water reports that of 484 written complaints in this category, 235 were answered within 10 working days. However, the Company has not been able to confirm how many were responded to in more than 20 working days.

3. The year end report relates to contacts closed by 31 March, including responses with a holding response issued by 31 March which has been closed subsequently. Some holding responses issued by 31 March remained open at end of May and were not included in the report. We recommend that the Company considers how these responses will be reported in subsequent years. We recommend that the Company considers why holding response remain open after two months and whether it is reasonable to eventually report these as closed at the initial holding response date.

4. The Company provides a breakdown of complaints by category. The Company is not identified any complaints which were escalated to second stage review. The Company has received complaints in the report year which relate to the third complaint about and issues and have been forwarded to the NI Water escalation team for action.

8.1.2 Commentary on confidence grades

The Company has reported a confidence grade of B2 for Lines 1 to 3. In view of the complaints received which are not included in the return, we recommend confidence grades of

- Lines 1 and 2 C4
- Line 3 D6

9 TABLE 6A – BAD DEBT - OUTSTANDING REVENUE AND BREAKDOWN OF CUSTOMER SERVICES OPERATING EXPENDITURE

The reporting requirements do not require reporters to comment on Table 6A.

10 TABLE 7 – NON FINANCIAL MEASURES – WATER PROPERTIES AND POPULATION

10.1 Table 7 - Water Service Properties, Billing and Populations

10.1.1 Key points

1. The Company had no properties served by PPP schemes. From 2008-09 customers will be supplied by water produced by the Alpha PPP concession. However, this water is pumped into NI Water's distribution systems and customers will continued to be supplied by NI Water which remains responsible for the quality of water and the quality of the service provided.

2. There is still uncertainty in the number of customers connected to the water service. The numbers reported by the Company are based on its assessment of property data provided by the Land & Property Service and the Company's own records of metered water supplies. Movement in the figures from 2006/07 reflect the efforts by the Company to cleanse data which identified the historic issues relating to the apportionment of revenue which came to light during the assessment of the Scheme of Charges for 2008-09. The Company has established a data integrity group to address these issues and ensure the consistent use of data on customers across different strands of the business including the Annual Information Return, the Scheme of Charges, the water balance and business planning activities. We expect to see some movement to the reported figures as further data cleansing is carried out. Further movement is likely to occur as billing of different categories of customers is introduced and customers respond to bills being issued. In the short term we expect further movement in the numbers as the Company carries out further work on test meters, zero read meters and supply meters.

3. The Company reports metered supplies to farms as households billed measured.

10.1.2 Approach to audit

During our audit we:

- Met with Company staff to understand the methodology determine property numbers reported for 2007-08 and review action taken by the Company to cleanse data and improve its understanding of the number of properties connected to water supply.

- Followed sample audit trails through Company data to better understand work done to compile and cleanse the data.

- Where possible, reviewed the data reported by the Company against external data sources to validate the reported figures.

10.1.3 Commentary on Company methodology

Property information - general

The Company has based its report on numbers of properties on customer information developed from two sources:

- The Northern Ireland Water Service systems for billed metered water.
- Information provided by Land and Property Services (and its predecessor bodies) which was used to develop lists of customers in preparation for un-measured non-households and household billing.

The Company has undertaken a range of data checks to cleanse and reconcile the data to provide an estimate of the number of properties connected to water supply.

At the time NI Water prepared its proposed Scheme of Charges for 2008-09, the Company identified a number of errors in previously reported figures which had a material impact on the balance of revenue which would be generated directly through customer bills and the balance of revenue to be provided by Government subsidy.

In response to issues identified when preparing for the Scheme of Charges, NI Water has established a data integrity group with a view to cleansing and reconciling property data to provide a single and consistent source of data which can be used across a range of issues include the Scheme of Charges, the water balance, customer contact and asset management. The same source of data will be used to generate Annual Information Returns.

Pending the outcome of the work being carried out by the data Integrity Group, the property figures reported in Table 7 represent NI Water's current best estimate of the average number of properties in each category over 2007-08. This is based on:

1. An abstract of property data from Rapid Extra at 01 April 2007.
2. A series of adjustments to that data to correct for errors now known to have existed on Rapid at that time. The adjusted data provides the Company's best estimate of property data at 01 April 2007.
3. An abstract of property data from Rapid at 01 April 2008
4. Further adjustments to the property data from Rapid at 01 April 2008 to reflect corrections to the data known to have taken place by 01 April 2008 but not yet included on Rapid.

The Company has reported the average of the "restated" 01 April 2007 and "adjusted" 01 April 2008 in AIR08 to reflect mid year figures.

In some areas we are concerned that some adjustments made to establish the 01 April 08 values should also apply to the 01 April 07 data. If the same approach is applied in future years, we recommend the Company ensures that relevant assumptions are applied to both the year start and year end figures.

Despite the detailed work undertaken to combine, cleanse and reconcile this data to make a reasonable estimate of the number of household and non-household properties connected to the water service a number of issues remain to be resolved. Some uncertainty remains to be resolved in respect of potential duplicates, test meters and sites meters which are outlined below.

While further work can be done to resolve data issues, proper records of customers will only develop if direct customer billing is introduced. The response to bills being issued and subsequent follow up work would improve confidence in customer information. Even then, experience suggests that it will take time to identify all connected customers.

Initial data development

The base data in Rapid was derived from:

- Land and Property Service Data provided to NI Water.
- NI Water Hi Affinity data for metered accounts.

Key information taken from the Land & Property Services data included:

- The property address.
- Whether a property is domestic (has a capital value) or non-domestic (has a net annual value).
- Whether a property is connected to the water service, the sewerage service or both.
- Whether a property is unoccupied.

In preparing the data, the Company had to map particular data flags or attributes to allocate properties between the particular reporting categories. Each step in this process includes some element of judgement which adds to the inaccuracy and uncertainty which must exist in the underlying data.

Metered accounts and potential duplicates

The LPS data was compared with the Hi Affinity metered accounts data to identify and remove non-household properties already covered by metered accounts (potential duplicates).

In most cases where a metered account could not be matched to a property, the Company was able to identify the supply as either:

- a cattle trough identified by a data attribute from Hi Affinity
- a cross border supply identified by a data attribute from Hi Affinity

At present, the Company is unable to match 1485 metered accounts to a property or confirm that the account should not be matched to a property. There is a potential that these supplies are duplicated as both a metered water supply and an unmeasured non-domestic supply. Detailed checks are being made to confirm the status of these accounts.

Test meters

"Test meter" was a classification of meter existing on the Northern Ireland Water Service metered water database which was carried into the NI Water Rapid data. It represents meters read by the Company but not billed.

Before the development of the Scheme of Charges for 2008-09, the volume of water associated with these meters had been included in the non-household billed measured water volume. A total of 10,743 "test meter" supplies were identified with consumption of 10.1 Mld.

At the time of the interim principal statement it was recognised that no revenue was received from these supplies and investigations triggered into the connections. For the purpose of the interim principal statement it was assumed that 5000 of these meters would initially be identified as unmeasured non-household and that this would decline to 3000 unmeasured non-household in 2008-09 as the supplies were assessed and moved to measured supply status.

The allocation of these accounts for Table 7 was based on the following assumptions and assessments:

- A working assumption for that all 10743 test meters served household properties.
- An assessment in the year which matched 4804 test meters to household properties.
- A working assumption for 01 April 2008 that the remaining 5997 "test meter" properties serve non-household properties.

As a result "Test" meters are allocated for table 7 as follows:

Item	01 Apr 07	01 Apr 08	AIR08 Average
Connected household test meters	10631	4807	7772
Connected non-household test meters	0	5997	2999

The use of different assumptions at for year start and year end result in an inconsistency in the reported data. However, this, and similar issues must be considered within the context of the overall accuracy of the billing numbers. The Company is undertaking detailed work to establish the status of test meters and to arrange billing where appropriate.

Site meters

The Company has noted that non-domestic properties on areas such as shopping centres or industrial estates can be served through a single site meter which is charged to a landlord who recharges individual property owners through rents or service charges.

The Company identified 9291 properties of this type at 01 April 2008 which are on the LPS non-domestic data set. These have been removed from the billing figures.

The Company has identified a further 1900 properties which may fall into this category and are yet to be resolved. At present the Company has assumed that none of these properties will be determined as duplicates of unmeasured non-household properties.

Other changes

Other changes to property information over the year includes:

- Changes in the type of supply due to meters being installed.
- New connections made in the year based on NI Water connection records which have been entered on Rapid Xtra.
- Refreshed LPS data recording data changes other than new connections.

Treatment of farm properties

Farm properties are served through metered accounts which include both the supply to the farm and the farmhouse.

For consistency with previous years, the Company has reported the number of metered water supplies to farms as households billed measured water and excluded them from non-households billed measured water.

We recommend that these accounts should be reported as non-household billed measured water in the future in both Tables 7 and 10.

Population data

Population data is base on NISRA population projections (2006 based).

Households billed measured water is an estimate of population included in farms based on the average occupancy rate for detached properties taken from NI Water's PCC Monitor.

The non-household population is the population resident in communal establishments determined from the 2001 census. The population has been allocated between measured and unmeasured properties in proportion to the number of connected properties.

The residual population is allocated to households billed unmeasured. This includes population in households not connected to the water supply.

10.1.4 Commentary on individual line entries including confidence grades

The Company is not required to report confidence grades for Table 7. At present, the Company does not bill most of its customers; the number of customers is estimated; and there is continued uncertainty to be resolved regarding customer records. In these circumstances, a confidence grade on the reported numbers would be helpful to inform the regulator and other stakeholders on the Company's view on it confidence in the data as it is reviewed and cleansed.

Lines 1&2 Record of new connections in the year are maintained by the Operations Directorate. When connections are completed they are uploaded to the Customer Database in Rapid. We have not audited information on new connections for this return.

Line 3 The number of properties households billed unmeasured water includes properties identified as household and an additional 7801 "test meter" properties based on the average over the year. While we disagree with the averaging used to determine this number, reference to total household figures for Northern Ireland suggests that it is a reasonable estimate of household properties connected to the water supply.

Line 4 The number of properties reported as households billed measured water (external meter) are the properties identified as farms with a domestic component based on property data from the NI Water meter water billing systems. These properties are billed providing reasonable confidence in the data. There will be remaining uncertainty as to whether NI Water has identified all farms with a domestic component on its billing system.

Line 5 The Company reports no households billed measured water (external meter). NI Water installs meters in new properties as a matter of policy. However, it does not bill domestic customers for water supplies.

Line 6 The total number of households billed water is the sum of Lines 3 to 5. It includes supplies to farms.

Line 7 Includes household properties identified as void.

Line 8 The number of non-households billed unmeasured has been adjusted to exclude properties known to be served through a primary site meter. It includes an allocation of test meters on supplies not currently billed pending assessment of these supplies to determine whether they are chargeable.

It is possible that duplicate sites will be identified as the remaining potential site meter properties and test meter properties are resolved.

A high proportion of unmeasured non-household properties are identified as void. It is possible that some will be found to be connected and billable following inspection by NI Water void inspectors. It is possible that others will be confirmed as not connected.

We understand that the figure submitted by the Company is in error and the corrected figure is 31341.

Line 9 The number of non-households billed for measured water excludes the 30,495 farm properties reported in Line 4.

The number of billed measured properties does not reconcile to the number of properties reported against DG8 in Table 5.

Line 10 The total number of non-households billed water is the sum of Lines 8 and 9. It excludes supplies to farms reported in Line 4.

Line 11 Includes non-household properties identified as void.

Line 12 Line 12 reconciles to the total properties (lines 7 and 11) less the number of properties reported as billed.

The number of domestic void properties is similar to the number of void properties reported in NISRA household statistics.

Line 13 The population in households billed unmeasured water is the total estimated population in 2007-08 taken from NISRA population projections 2006 less population reported in the subsequent lines. As a result, it includes population in properties not connected to the water supply. Based on LPS data, NI Water estimates that 5944 properties domestic properties are not connected to the water supply. Based on average occupancy rates these properties would have a population of 15 454. However, we would attribute a low level of confidence to both the reliability of the connected property data and the assumption that these properties would have average occupancy rates.

Line 14 The population in households billed measured water is the estimated population in farms served through metered water supplies. The population is based on an estimated occupancy rate for a detached property derived from NI Water's unmeasured household per capita consumption monitor.

Line 15 and 16 The population in non-households is the population allocated to communal establishments in the 2001 census. The allocation between measured and unmeasured properties is based on the number of properties and should not be used with any confidence.

Line 17 The total population is the total population in Northern Ireland and includes population in properties not connected to the water supply.

11 TABLE 8 - NON FINANCIAL MEASURES – WATER METERING

11.1 Table 8 - Block A – Household Meter Installation

The Company has reported the total number of meters installed in Line 4 only.

The Company installs meters on supplies to new households. Records of new connections are maintained by the Operations Directorate. Once new connections are complete they are uploaded to the Customer Database and exported to the metering contractor. NI Water has advised us that, in the report year, the time lag on this multistage process, issues with the initial paper based systems and implementation of the new electronic system resulted in a backlog of new connection job closures and subsequent meter installations. As a result the reported number of household meters installed is significantly less than the number of new connections reported in Table 7 line 1.

We have not audited household meter installation for the report year.

12 TABLE 9 - NON FINANCIAL MEASURES – WATER QUALITY

12.1 Key Points

1. The report relates to the calendar year 2007.

2. The Company maintains a spreadsheet showing continuing and new Authorised Departures with the relevant distribution inputs, populations and property numbers, although Authorised Departures start dates do not appear to be recorded.

3. For AIR08 distribution input is based on measured flows into distribution. This compares with the method used for AIR 07, where DI was based on expected annual average flows. This results in a reduction in the reported DI figures when comparing AIR07 and AIR08.

4. Progress on agreed programmes of work is monitored at regular meetings between NI Water and DWI. Authorised Departures are not formally signed off by DWI.

5. Work is on programme to meet all Authorised Departure end dates. In one case a temporary solution has been installed to meet the Authorised Departure date, in advance of a permanent solution.

6. The water treatment PPP concessions did not come into effect in the report year. From 2008 water will be put into supply from the Alpha PPP concession.

12.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of one meeting with the Company. During the audit meeting we:

- reviewed the data sources and assumptions used by the Company in the analysis;
- reviewed the methodology used by the Company to estimate annual average daily flow rates;
- confirmed current Authorised Departures and the WTWs and WSZs to which they apply
- reviewed the monitoring of the projects which make up the programmes of work agreed with DWI;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirements expect as set out in the Company's commentary;
- reviewed the confidence grades ascribed to the reported data by the Company.

12.3 Table 9 - Block A – Water Treatment and Distribution

12.3.1 Comments on the Company's Methodology

At the beginning of each year, DWI issues an agreed list of current Authorised Departures, confirming both start and finish dates. Further Authorised Departures may also be issued by DWI during the year. The Company maintains and keeps updated spreadsheets of WTWs and WSZs, in which all current Authorised Departures are flagged against the WTW and WSZ affected. Authorised Departure determinand limits, Authorised Departure end dates, numbers of properties affected, estimated remedial costs and annual average daily flow rates are also shown for each WTW and WSZ. When a new Authorised Departure is issued a flag is placed against the relevant WTW and WSZ(s) in the spreadsheets. It was however noted that the start dates of Authorised Departures do not appear to be recorded in the spreadsheet.

The methodology used to estimate annual average daily flow rates is covered in our comments on Table 10 below. In AIR 07 DI was based on expected annual average flows, whereas for AIR08 DI is based on measured flows in distribution. This results in a reduction in the reported DI figures when comparing AIR07 and AIR08.

Lines 1 and 2 of the table are derived by sorting the spreadsheet for WTWs having continuing and new Authorised Departures in the year and summing distribution input for these categories. Line 4 is calculated by comparing the total DI of WSZs unaffected by Authorised Departures with the overall total DI. Populations for lines 5 and 6 are allocated to WSZs by comparing MapInfo address points with WSZ boundaries on GIS. Lines 5 and 6 are then derived by sorting the spreadsheet for WSZs having continuing and new Authorised Departures in the year and comparing total distribution input in each of these categories with the overall total DI.

The Company has no imported bulk supplies.

12.3.2 Comments on Line Entries

A sample of individual Authorised Departures was seen and lines 1 and 2 in Table 9 were reconciled with spreadsheet data. As Authorised Departures start dates do not appear to be recorded in the spreadsheet there is a small risk that the start of new Authorised Departure could be missed, resulting in under-reporting of line 2. This would also affect the calculation of lines 3 and 5. It is recommended that Authorised Departure start dates should be recorded in the spreadsheet. The WTWs and WSZs relevant to Lines 1, 2 and 3 were reconciled with the DWI lists.

Authorised Departures are not formally signed off by DWI, although the progress of remedial works and the completion of works necessary to end an Authorised Departure are covered in quarterly meetings with DWI. This gives rise to a small risk that the ending of an Authorised Departure could be missed, resulting in misleading reporting of lines 1-5.

12.4 Table 9 - Block B – Distribution Input Covered by Work Programmes Agreed with DWI

12.4.1 Comments on the Company's Methodology

WTWs and WSZs affected by Authorised Departures are identified as described in Section 13.3.1. above. During monthly meetings with DWI, remedial measures are agreed and remedial projects are entered into the NI Water investment programme. The agreed programmes of work cover the following areas:

Line 6 Raw water deterioration due to pesticides. This affects 4 WTWs. PAC plants are to be provided at Camlough and Dorisland. Lough Cowey and Lough Braden are to be abandoned. There are no raw water sources affected by nitrates.

Line 7 Plumbosolvency reduction. The Company has agreed to deal with this issue by dosing all water entering supply with orthophosphate, excepting only a number of small borehole sites which are to be abandoned. Orthophosphate dosing has been installed and the results are being monitored.

Line 8 Reducing Cryptosporidium risk. Risk assessments were carried out on all WTWs during 2007. Each works was scored on a risk basis using procedures approved by DWI. The agreed threshold for action was a score of 50. Only Lagan Valley exceeded this threshold, with a score of 59. The action agreed with DWI for this site was increased monitoring. DWI is satisfied that the use of this approach is sufficient to manage the risk of Cryptosporidium and no investment programme is required.

There are no other agreed work programmes.

Progress on these programmes is monitored at regular meetings with DWI. During the audit NI Water presented an example programme monitoring report. It was not possible to fully reconcile this with the Capital Investment Monitoring Template (CIM) as some projects forming part of agreed DWI work programmes are PPP projects which do not appear on the CIM. The monitoring report showed all projects on track for completion before the agreed Authorised Departure end dates, although in the case of Seagahan a temporary flow filter has been installed in advance of the permanent solution to ensure compliance by the Authorised Departure end-date.

12.4.2 Comments on Line Entries

The distribution input relevant to lines 6-8 is calculated from the spreadsheet by summing the DIs for zones affected by the relevant parameter. In AIR 07 DI was based on expected annual average flows, whereas for AIR08 DI is based on measured flows in distribution. This results in a reduction in the reported DI figures when comparing AIR07 and AIR 08.

On a sample basis the DI affected by each parameter was reconciled with the base spreadsheet data. Line 6 refers to 4 WTWs. Line 7 refers to the whole DI, except for small borehole sources now scheduled for abandonment. Line 8 refers to the whole DI. No flows are covered by line 9.

12.5 Comments on Confidence Grades

The allocated confidence grade of A2 is supported for all lines. The data are held in auditable corporate systems. The accuracy component of 2 reflects the accuracy of the original measurements.

13 TABLE 10 – NON FINANCIAL MEASURES - WATER DELIVERED

13.1 Key Points

1. The Company has reviewed the components of its water balance in light of improvements to data on customer numbers and measured consumption over the year. These changes reflect the revised information initially presented in the Interim Principal Statement and Scheme of Charges in January 2008 and on-going work by the Company to resolve data issues.

2. For the report year the Company has assessed its leakage using two methodologies:

    i. A top down assessment of water balance components, with leakage taken as water unaccounted for by other components in the water balance. The top down leakage was assessed as 184.19 Mld.

    ii. A bottom up assessment of measured nightime flows based on almost comprehensive DMA coverage. The bottom up leakage was assessed as 152.45 Mld.

3. The reported imbalance of 31.74 Mld is 5.17% of the distribution input. This is 1.0 Mld above the 5% threshold set by the Utility Regulator. Where the imbalance is below this threshold, the Company can redistribute the imbalance across other components of the water balance using a most likely estimating (MLE) adjustment. Above this threshold the reporting requirements note that all the imbalance should be taken as leakage. This would result is reported leakage rising from 168.75 Mld reported for 2006-07 to 184.19 Mld for 2007-08, well in excess of the Company's leakage target of 157.0 Mld (KPI 11).

4. In view of the marginal exceedance of the 5% threshold and the uncertainty yet to be resolved in the water balance data, the Company has opted to apply the MLE adjustment and report leakage for the year of 156.52 Mld. The alternative would be to report a leakage of 184.19 Mld with the potential that further work to resolve the uncertainty in the underlying data will return the Company below the 5% threshold in 2008-09 resulting in a significant reduction in reported leakage in subsequent years.

5. In reaching its conclusion to report a bottom up leakage figure subject to MLE adjustment the Company reflects three key issues:

    i. An assumption that the uncertainty in the top down leakage is materially greater than the assessment in bottom up leakage.

    ii. That the bottom up measured leakage figure has moved downwards over 6 years on a consistent methodology, reflecting work undertaken by NI Water to reduce leakage.

    iii. That pending the completion of work either underway or proposed to improve confidence in both the bottom up and top down leakage estimates, it would be prudent to report leakage on a consistent basis with previous years. This would avoid material fluctuations year on year which would arise from small movements in the calculated imbalance relative to the 5% threshold figure.

6. The bottom up leakage estimate is based on 1040 DMAs which cover 99% of the properties in Northern Ireland. Only 10 DMAs were excluded from the 2007-08 leakage estimate because of rehabilitation work was being undertaken. Over 80% of the DMAs are monitored with electromagnetic meters with a direct link to the Company's telemetry system. The remaining DMAs are monitored through mechanical meters with loggers. The high level of DMA coverage and the active monitoring undertaken gives reasonable confidence in the bottom up leakage estimate.

7. We note that further work to resolve the uncertainty in connected properties and measured consumption might result in the reported imbalance reducing or increasing. For example, further work on "test" meters and unresolved properties fed through a primary site meters might increase the imbalance. Equally, further work through on meter under-registration and unmeasured per-capita consumption might reduce the imbalance.

8. In its bottom up leakage assessment the Company continues to make use of industry standard assumptions on legitimate night-time use and night-time to average day conversion factors. We understand that the assumptions applied in the report year have been applied consistently in the past 8 years. NI Water proposes to undertake research to confirm these assumptions or, if appropriate, to adjust them to reflect the performance of its distribution system. The outcome of this work might either increase or reduce the bottom up leakage assessment based on measured night-time flows.

9. The MLE adjustment applied by the Company distributes 27.67 Mld (87.2%) to water consumed and 4.07 Mld (12.8%) to leakage. The key assumptions are: that the accuracy of the bottom up leakage assessment is 5%, the accuracy of measured and unmeasured water consumption is 10% and the accuracy of water taken unbilled is 25%. The accuracies adopted by the Company are judgements which generally have been applied in previously years. These judgements, particularly the 5% accuracy ascribed to measured leakage, are material to the reported leakage figure. We believe that the Company should review its assessment of accuracy of individual components and provide supporting justification for the relative accuracies applied. We recommend that this should reflect the on-going work to improve customer and consumption figures.

10. In view of the size of the imbalance between the top down and bottom up leakage estimates and the need to reduce uncertainty in the quantity of leakage, we recommend that NI Water:

    i. Develops a programme of work to address weaknesses in the water balance including: connected property and consumption figures; unbilled consumption; and, key assumptions in the bottom up leakage estimate.

    ii. Identifies the level of certainty which will be achieved for individual components of the water balance and leakage assessment through this work.

    iii. Identifies residual material assumptions which will be required to develop the water balance including the bottom up leakage assessment.

11. It is possible that the completion of this work and resulting changes to data and assumptions used in the water balance will result in a level of leakage which is materially different from that reported in the past. If this is the case, it would be necessary to review the leakage targets for NI Water against revised data and assumptions to ensure that NI Water continues to move towards an economic level of leakage at a sustainable and economic level of investment.

13.2 Approach to the Audit

During our audit we:

- Met with Company staff to understand the methodology adopted to prepare the water balance.
- Met with Company staff and undertook audits to understand and test the assessment of mid-year property, population and measured consumption figures used in the water balance.
- Reviewed the water balance in detail, making an assessment of material assumptions used and considered whether these were central estimates taking account of the source of the data and the sources of uncertainty in the estimates.
- Challenged the Company's assessment of the water balance and responded to changes in the figures.

13.3 Commentary on the Company's Methodology

The Company has completed its water balance taking account of revised data on customer numbers and measured consumption over the year. These changes reflect the revised information arising presented in the Interim Principal Statement and Scheme of Charges in February 2008 and on-going work to resolve data issues.

The Company has revised metered consumption to take account of the work done to cleanse data and ensure that data reported is actual consumption excluding internal measurements and trade effluent. In part, the volume through meters previously reported as water delivered has been reallocated to water taken unbilled.

The Company has updated its unmeasured per-capita consumption (PCC) based on a small area PCC monitor. The per-capita consumption has not changed materially over the report year.

The Company's internal reports on the PCC monitor suggests further improvements in the monitor data, in particular the need to update occupancy rates. While there is some doubt over occupancy rates, the average occupancy rate for the monitor is similar to the average for Northern Ireland suggesting that the average PCC remains a central estimate.

Billed unmeasured non-household has reduced significantly from the previous year. This reflects the reduction in unmeasured non-household numbers identified as part of the on-going customer data cleansing work carried out by NI Water and reported as part of the work leading up to the Interim Principal Statement and Scheme of Charges in February 2008.

The Company has reassessed the volume of water taken unbilled, resulting in a significant increase in volume reported in this category. The increase reflects:

- The reallocation of measured volumes previously reported in billed measured non-household.
- A more detailed assessment of water taken unbilled including water taken at NI Water sewage treatment works.

The water taken unbilled includes part of the volume taken through "test" meters previously reported as water delivered under billed unmeasured non-household (7.2 Mld). The Company has begun to investigate these meters in detail on a case by case basis. This will determine whether the measured volume is additional supply or already accounted for in other components. At this stage the Company has assumed that none of this volume is already accounted for in the water delivered un-measured non-household.

The Company has prepared a bottom up estimate of leakage based on night-time flows from DMA meters which provide almost universal coverage of Northern Ireland. The bottom up leakage is based on industry standard practice. While the bottom up leakage assessment is based on detailed measurement, it includes a number of material assumptions which introduce uncertainty in the analysis such as:

- Use of industry standard assumptions for legitimate night-time consumption.
- Use of industry standard assumptions for the conversion of night time measured leakage to average day leakage to account for lower system pressures during the day.

NI Water proposes to undertake specific assessments to address these and other assumptions or uncertainty in the water balance and the bottom up leakage assessment.

In the report year, the Company has reported a residual between the top-down and bottom up leakage of 31.74 Mld which exceeds the 5% threshold below which the Company can distribute the residual across other components of the water balance. Despite exceeding this threshold the Company has opted to apply an MLE adjustment which brings its reported leakage for the year to 156.52 Mld. The assumptions used in the MLE adjustment are a matter of judgement. The MLE adjustment calculation assumes that each component in the calculation is a central estimate. In view of this the MLE adjustment as a process does not necessarily resolve and improve uncertainty in the reported leakage figure.

In reaching its conclusion to report a bottom up leakage figure subject to MLE adjustment the Company reflects three key issues:

1. An assumption that the uncertainty in the top down leakage is materially greater than the assessment in bottom up leakage.
2. That the bottom up measured leakage figure has moved downwards over 6 years on a consistent methodology, reflecting work undertaken by NI Water to reduce leakage.
3. That pending the completion of work either underway or proposed to improve confidence in both the bottom up and top down leakage estimates, it would be prudent to report leakage on a consistent basis with previous years. This would avoid material fluctuations year on year which would arise from small movements in the calculated imbalance relative to the 5% threshold figure.

Our detailed commentary is on individual components of the line entries are included below.

13.4 Commentary by Individual Line Entries including Confidence Grade

13.4.1 Table 10 - Block A – Water Delivered – Volumes

Line 1 Billed measured household

In common with previous years, NI Water has reported farms served by a meter as billed measured households. We recommend that, in line with the reporting requirements, these properties should be reported as billed measured non-household with an appropriate adjustment made for the resident population in other lines.

NI Water has assumed that each farm includes a detached domestic property with an occupancy of 2.77 and per-capita consumption of 158.34 l/h/d for detached properties determined from the PCC monitor.

The calculated consumption is subtracted from the billed measured non-household volume.

A domestic meter under-registration (MUR) of 3.9% (an industry standard assumption for domestic properties) has been adopted for the domestic component of the farms although this volume has been measured through non-domestic meters. Had the non-domestic meter MUR of 4.9% been applied to the total measured farm supply this would have increased the billed volume delivered by 0.13 Mld.

Line 2 Billed measured non-households

Volumes are extracted from the Company's billing systems for all meters. Based on previous work by NI Water to cleanse the metered data, meters in the following categories were identified and addressed as follows:

Meter Category	Description and Treatment
Zero meters	These are meters registering zero over the report year. NI Water is investigating these supplies and have identified that some should be registering measured volume. Pending further investigations the Company has excluded these meters from measured billed. An adjustment has been made to water taken unbilled based on sample surveys carried out to date.
Test meters	These are meters tagged as "test" on NI Water's records. A total consumption of 10.2 Mld is recorded against these meters which is not billed. To date, the Company has matched 4804 meters in this category to domestic properties and adjusted the billed unmeasured non-household consumption to suit. The Company has assumed that all unmatched meters have not been accounted for elsewhere in the water balance. The measured volume for these meters (7.17 Mld) has been excluded from measured billed and added to water taken unbilled.
Trade effluent	These are either direct measurements of trade effluent or customer boreholes read to establish trade effluent volumes. They have been excluded from the measured volumes.

Free supplies	These are supplies identified on the Company's records as free supplies. NI Water is investigating individual supplies to establish whether there is a legal right to a free supply. The category may include supplies to government establishments not charged in the past. Pending the outcome of this investigation, the volume has been excluded from the billed measured volume and included in water taken legally unbilled.
NI Water supplies	These are measured supplies to NI Water facilities including treatment works, pumping stations and depots. The supplies have been excluded from measured billed and included in water taken unbilled. NI Water has used the data to assess supply volumes to NI Water facilities which are not metered which has also been included in water taken unbilled.
Farm meters	These have been included in water taken billed subject to deduction of the allowance in Line 1 for domestic consumption at farms.

The billed consumption for 2007/08 is given as 46,105,858 m3 (126.31 Mld).

To derive the billed measured non-household total the domestic farm supply, calculated for Line 1 was subtracted and non-domestic MUR of 4.9% added.

Line 3 Total billed measured consumption is the sum of lines 1 and 2 calculated within the table.

Line 4 Billed unmeasured household.

Billed unmeasured household is determined from:

- An estimated total domestic population in household properties.
- An estimated per-capita consumption for unmeasured households adjusted for meter under-registration.
- An adjustment for known volumes at test meters identified as domestic properties.
- An estimate of supply pipe leakage.

Domestic population in unmeasured household properties

The domestic population in unmeasured household properties is determined from:

- The mid year estimate of total population in Northern Ireland taken from NISRA 2006 based population projections.
- A deduction of the estimated population living in communal establishments based on the 2001 Census data.
- A deduction of the estimated population living on farms, consistent with the number of metered farm properties assuming an occupancy rate based on a detached property.

- A deduction for properties not connected to the water supply based on data from the LPS incorporated into the Company's customer data.

While each element of the estimate includes a degree of uncertainty it is based on NI Water's best assessment of the data available.

Unmeasured per-capita consumption

The Company has a well developed unmeasured per capita consumption monitor. The per-capita consumption generated is stable year on year. The Company has identified a number of issues relating to the quality of the monitor which, if resolved would improve confidence in the reported figures:

- The need to update occupancy of properties included in the monitor areas. We understand that the Company has this work in hand. We take comfort from the fact that the average occupancy rate reported for the monitor is consistent with the average for Northern Ireland.

- The need to improve the balance of properties in the monitor to reflect detached properties.

- Concern that some of the small area monitors are in holiday areas and the impact of variable occupancy over the year has not been assessed.

The Company has adopted the average consumption over the monitor to apply to the population of Northern Ireland connected to the water service.

NI Water has applied industry standard domestic MUR of 3.9%. The volume attributed to MUR has been calculated by adding the volume derived from the unmeasured population to the test meter volume and multiplying by 3.9% (9.32 Mld).

Adjustment for farm properties and properties not connected

The adjustment for population in farm properties and properties not connected to the water supply is based on the estimated occupancy of detached properties (from the PCC monitor) and the estimated average occupancy rate respectively. It is possible that further investigation might demonstrate that occupancy rates for these particular property categories vary significantly from the averages used.

Adjustment for test meters.

The Company has made an adjustment for the 4804 properties served by "test" meters which were identified as domestic. We understand that the number of properties was deducted from the total number and the measured volume for the year included. The average consumption for these properties is higher that the average unmeasured domestic consumption and the adjustment for test meters adds 1 Mld to the water balance over the average unmeasured domestic property consumption.

The PCC monitor is intended to be a representative sample of properties across Northern Ireland although we recognise that the sample is limited by practicalities. The monitor does include groups of properties with a high PCC, although not as high as the implied average for the test meter properties. It is likely that these properties were metered in the past because of some

specific reason such as the size of the property or high water consumption such as a swimming pool. Based on these observations, NI Water has concluded that this category of property is not be covered adequately by the PCC monitor and that it is reasonable to substitute in the measured volume.

Adjustment for supply pipe leakage (SPL)

The Company has reported SPL of 63.58 l/prop/day compared to 67 l/prop/d in the previous year. The basis of the assessment is described under lines 10 to 13 below.

Test meters properties are excluded from the assessment as the measured consumption already includes SPL.

Line 5 Billed unmeasured non-household

The reported volume of billed measured non-household has declined from 41.73 Mld in 2006-07 to 24.48 Mld in the report year.

Work undertaken by NI Water to cleanse its property data has resulted in a marked reduction in the number of properties included in this class. In view of on-going work on data integrity, it is possible that there will be further movement in this number through general data cleansing and as the Company resolves issues relating to test meters and properties served through a primary meter.

There are a high proportion of voids in the category. Of the 35,446 unmeasured non-domestic properties, 7081 are recorded as unoccupied – 20%.

Part of the reduction in the number of unmeasured non-household properties relates to properties on served through a common supply meter. This includes properties on industrial estates or shopping centres. There continues to be some uncertainty over 1900 properties currently included as unmeasured non-household which further investigation might show are served through a primary meter.

To assess consumption of unmeasured non-household properties, NI Water undertook an analysis of consumption at measured non-household properties and derived a weighted average consumption for property types matching unmeasured categories.

Average consumption in each property category was assessed but discounting the highest 10% and lowest 10% in each category. This excluded extremes of high consumption and some zero readings from the analysis. It goes some way to address the uncertainty created by a concern that measured property consumption may not be a good reflection of unmeasured property consumption.

The estimate of un-measured non-household consumption was then based on categories of properties with the lowest average consumption. Categories covering 26,316 properties were used to derive an unmeasured non-household average consumption of 270 m3/prop/year (740 l/p/d).

The analysis is consistent with the analysis used to estimate the unmeasured non-household consumption for 2008-09 included in the Interim Principal Statement and Scheme of Charges. For the Scheme of Charges, it was

assumed that the on-going metering programme would target higher consumption properties. On this basis, a lower average consumption was used in the Scheme of Charges consistent with 21000 properties in the property categories with lowest average consumption.

Supply pipe leakage has been added using the same approach as for billed unmeasured household properties. However, because the average unmeasured non-household consumption was calculated from meter records the SPL is already included. Correspondingly, as the average was derived from metered data, an allowance for MUR, which hasn't been included, should be added in. Correcting for these would reduce the total billed unmeasured household volume from 23.24 Mld to 22.46 Mld (pre MLE), a reduction of 0.78 Mld.

This element of the water balance will always remain uncertain. However, the on-going metering programme should reduce the number of unmeasured properties and the associated volume and reduce the impact of the uncertainty on the water balance.

13.4.2 Table 10 - Block B – Unmeasured Water Delivered Per Property

Line 7 The estimated water delivered per unmeasured non-household was derived for the calculation for Line 5, and is discussed above. The data has been derived from metered data and should not be adjusted for SPL and should be adjusted for MUR. Correcting for this would reduce the water delivered per property from 803.30 l/p/d to 776 l/p/d.

The Company has reported a confidence grade of B4 for the estimated water delivered per property non-household. The data is based on measured non-household consumption and assumes that this is representative of unmeasured non-household consumption. On this basis we accept the confidence grade reported by the Company.

Line 7a The estimated water delivered per unmeasured household is based on the unmeasured per capita consumption, occupancy rates and meter under-registration described above.

The Company has reported a B4 confidence grade for its unmeasured non-household consumption. Based on uncertainty in the data, we believe that reported confidence grade is reasonable but believe that the accuracy lies at the upper end of a B4 confidence grade, approaching B3.

13.4.3 Table 10 - Block B –Household PCC

Line 8 The unmeasured household PCC is derived from NI Water's PCC monitor. The PCC monitor comprises of 109 sites set up specifically to monitor household consumption. The average size of the sites is 49 properties and they are discretely valved areas of entirely domestic properties. It is our understanding that the monitor complies with UKWIR report "Best Practice for Unmeasured Per Capita Consumption Monitors".

The reported PCC has not been adjusted for meter under-registration with meter under-registration added into the water balance. We recommend that

the Company assesses the accuracy of meters used in the monitor to confirm the level of meter under-registration.

The Company has reported a B3 confidence grade for its unmeasured non-household consumption. We consider this to be reasonable.

Line 9 Within the monitor the number of apartments and detached, semi-detached and terraced properties has been identified and this has been used to produce both the average and detached property PCC. The detached property PCC has been used for the farm domestic consumption calculation in Line 1 and is reported in Line 9.

13.4.4 Table 10 - Block B – Underground Supply Pipe Leakage

Lines 10 to 13 SPL has been estimated on behalf of NI Water by consultants who adopted default values presented in the UKWIR Report "Towards best Practice for the Assessment of Supply Pipe Leakage."

Background leakage was estimated using a flow rate of 45 l/hr/km and a 10m pipe length at an estimated average pressure of 50 metres. Over 24 hours this gives a total of 7.69 Mld.

The burst volume was based on an average DMA survey rate of 20 months for NI plus 4 days to process notice, 28 days notice period and an average repair time of 8 days. Adopting a run rate of 450 l/hr at 50 metre pressure gave total burst volume of 37.45 Mld.

The total SPL estimation was therefore 45.14 Mld. This has been divided by 709,997, the total of unmeasured household and non-household properties, to produce SPL per property.

The SPL attributable to billed unmeasured households (42.89 Mld) is derived from multiplying the SPL per property (63.58 l/p/d) by the number of unmeasured household properties including voids but excluding test meters.

SPL was assessed before finalisation of property numbers. This has a negligible impact on the overall background leakage element (0.02 Mld).

13.4.5 Table 10 - Block B – Meter Under-registration

NI Water does not currently have Company specific data on meter under-registration and has therefore adopted factors from Ofwat's Security of Supply 2006/07 Report. The MUR factors adopted for household and non-household are 3.9% and 4.9% respectively.

Line 14 The MUR for measured households was included in line 1 and calculated as 3.9% of the estimated consumption from farms (13.48 Mld) to give 0.53 Mld.

As noted for line 1 above, domestic meter MUR of 3.9% has been adopted for the domestic component of the farms although this volume has been measured through non-domestic meters. Had the non-domestic meter MUR of 4.9% been applied to the total measured farm supply this would have increased the billed volume delivered by 0.13 Mld.

Line 15 The MUR for measured non-households was included in line 2 and calculated as 4.9% of the estimated consumption from non-domestic properties - less the domestic volume estimated for farms - (112.83 Mld) to give 5.53 Mld.

13.4.6 Table 10 - Block B – Distribution System Operational Use

Line 16 NI Water has undertaken a comprehensive assessment of DSOU. They have considered the following 8 items of DSOU:

- Treatment works – Sample Taps, Filters etc. 1.13 Mld
- Service Reservoir and tower Cleaning 0.11 Mld
- Water Sampling 0.01 Mld
- Chlorine Samplers 0.33 Mld
- Repair Flushing 1.04 Mld
- New Houses 1.46 Mld
- Mains Renewal (subdivided by size) 0.14 Mld
- Water Quality Compliance 0.17 Mld
- Total (pre MLE adjustment) 4.39 Mld

The assessment has been updated for the report year based on a more specific assessment of types and quantity of consumption.

13.4.7 Table 10 - Block B – Water Taken Unbilled

Line 17 The quantity of water taken legally unbilled has increase from 8.76 Mld in the previous year to 25.09 Mld in the report year post MLE adjustment. The volume has increase to reflect a more specific assessment of water taken unbilled which now includes water either not identified or counted as water delivered in previous years.

NI Water has considered the following categories for water taken legally unbilled (the stated volumes are pre MLE adjustment)

- Sewer Jetting <0.01 Mld
- Sewer Blockages 0.04 Mld
- Standpipes 0.27 Mld
- Council Usage 0.81 Mld
- Fire Fighting 0.37 Mld
- Hydrant Maintenance 0.14 Mld
- WWTW (sub-divided by size) 4.82 Mld

- WWTW & SPS metered 1.36 Mld
- SPS's with screens 2.41 Mld
- Incinerator 0.40 Mld
- Tanker Usage 0.53 Mld
- NIW Depots & Offices (metered and assessed) 0.10 Mld
- Unmetered Government Buildings 0.27 Mld
- Free Supplies (metered) 0.46 Mld
- Test Meter Consumption (non-domestic) 7.17 Mld
- Zero Reading Assessment 4.00 Mld
- Total 23.15 Mld

We have commented on material elements of the overall figures below.

WWTW and SPS with Screens Consumption

NI Water has identified metered consumption at WWTWs and pumping stations with screens from its meter records. The Company has banded individual consumption figures by size and type of works. Within these bands a representative volume supplied was calculated by excluding the top 10% and bottom 10% and averaging the remaining consumption. The resulting averages were applied to unmetered works in the same size bands and treatment types. We understand the approach adopted by the Company but the outcome remains uncertain. It is not possible to confirm that works with metered supplies are representative of works without a metered supply. It might be reasonable to assume that individual assets were metered for a reason and that metered assets are likely to be those with a higher consumption. It is not possible to confirm that the 80/20 rule applied by the Company addresses this concern.

Test meter consumption

This is based on the measured consumption of all test meters which could not be identified as domestic properties. It is possible that further investigation of these supplies will show that it duplicates some properties included in the un-measured non-household category.

Zero reading meters.

The Company has begun an assessment of the supply meters with zero readings. The Company is concerned that some of these meters are failing to register consumption which could either be billed or registered as unbilled consumption.

A sample of 522 of the 6841 zero read meters were visited and 22% were found to have flow through the meter. The reported volume was extrapolated from the survey with the average consumption was applied to derive the total consumption of 4 Mld. The average consumption used in the estimate excludes the top 20% of registered volumes from meters surveyed. The assessment appears to be reasonable and may underestimate the volume

consumed. On-going work to assess the remaining meters and capture revenue should provide a more robust assessment.

Line 18 NI Water assessed water taken illegally unbilled from illegal connections (0.28 Mld) and hydrant vandalism (0.89 Mld). No allowance was made for illegal hydrant use.

13.4.8 Table 10 - Block B – Water Delivered

Line 20 Water Delivered is the sum of Billed Measured (Lines 1 & 2), Billed Unmeasured (Lines 4 & 5) and Water Taken Unbilled (Lines 17 & 18).

Lines 21 to 23 NI Water has not reported any non-potable water delivered or water delivered at non-standard rates in these lines.

13.4.9 Table 10 - Block B – Distribution Losses

Line 24 The distribution losses are calculated by subtracting the water delivered (498.10 Mld) and DSOU (4.97 Mld) from the Distribution Input in Line 26 (614.45Mld). This gives 111.06 Mld.

13.4.10 Table 10 - Block B – Total Leakage

Line 25 Total leakage is determined from the bottom and top down leakage estimates prepared by NI Water subject to a maximum likelihood estimate adjustment.

The top down leakage is determined from the components of the water balance described above. The estimated top down leakage including supply pipe leakage is 184.19 Mld.

The bottom up leakage is determined from nightline flow measurements from DMA meters as described in Section 13.3 above. The estimated bottom up leakage is 152.45 Mld.

The imbalance between the bottom up and top down leakage is 31.74 Mld (5.17% of the distribution input). This exceeds the 5% threshold above below which the imbalance can be distributed across the water balance components using an MLE adjustment. However, in view of the uncertainty in the top down leakage assessment and the marginal exceedance of the threshold level, the Company has applied the MLE adjustment as follows:

Component	Mld Pre MLE	Accuracy %	Mld adjustment	Mld Post MLE
Billed measured HH	14.01	10%	0.75	14.76
Billed measured NHH	118.36	10%	6.32	124.68
Billed unmeasured HH	291.07	10%	15.54	306.61
Billed unmeasured NHH	23.24	10%	1.24	24.48
Supply pipe leakage	45.14			45.14
DSOU	4.39	25%	0.59	4.97

Water taken unbilled	24.32	25%	3.25	27.57
Sum of components	582.70			614.45
Distribution input	614.45			614.45
Top down leakage	184.19			156.52
Bottom up leakage	152.45	5%	4.07	156.52
Imbalance	31.74			0.00
% imbalance	5.17%			

The accuracies used in the MLE adjustment are a matter of judgement by NI Water and not based on specific assessments.

In particular, we note that the assumption of 5% accuracy applied to the bottom up leakage is a material assumption which results in the 87% of the imbalance being distributed across the various components of consumption. Given the use of industry standard assumption to determine bottom up leakage, a higher accuracy would be not unreasonable. We recommend that as the Company reviews the various components of the water balance it develops a statement of its assessment of the relative accuracies applied in the MLE adjustment (based on data where possible) which can be subject to scrutiny and challenge. We recommend that, once these accuracy figures are established that they should be maintained to give a consistent methodology unless additional data is available to support any changes made.

The imbalance has been distributed in proportion to the weighted accuracy of the components. We believe that the correct approach to an MLE adjustment is to distribute the imbalance in proportion to the weighted square of the accuracy of the components. We recognise that there is a difference of opinion in the published literature on the subject.

The Company reports a confidence grade of B3 for total leakage. We consider this to be reasonable.

13.4.11 Table 10 - Block B – Distribution Input

The Distribution Input is derived from the 12 month rolling average meter records from the 21 resource zones summed up to the 4 supply areas and then to the Company level. The Distribution Input over the 12 months averaged 614.45 Mld across the whole Company.

The Company has not assessed or applied a meter under-registration to distribution input.

The Company reports a confidence grade of C3 for the distribution input. We consider this to be reasonable.

13.4.12 Table 10 - Block B – Bulk Supply

NI Water does not have any bulk supplies

13.4.13 Table 10 - Block B – Water Treated at Own Works to Own Customers

NI Water directly supplies a small number of customers in Eire but these are not considered to be bulk exports and so all water treated at its own work is deemed to be supplied to its own customer.

13.4.14 Table 10 - Block B – Overall Water Balance

The Company reports a confidence grade of C3 for the overall water balance. We consider this to be reasonable.

13.4.15 Table 10 - Block C – Security of Supply

The security of supply index is reproduced from Table 10A. Our commentary on the security of supply index is included under Table 10A.

14 TABLE 10A – NON-FINANCIAL MEASURES - SECURITY OF SUPPLY INDEX

14.1.1 Key Points

1. The Company is preparing to undertake a major update of its Water Resource Plan for 2009-10.

2. For this return the Company has relied on key data from the Water Resource Plan prepared by Northern Ireland Water Service in 2002 with current distribution input figures.

3. The Company has not distinguished between the planned and reference levels of service and has completed Tables 10a(i) and 10a(ii) (planned and reference levels of service) with the same information.

4. The Company has reported a SoSI of -26 which places it in the second worse position of all water service providers in the United Kingdom.

5. The low security of supply index relates to limits on treatment capacity and particular resource issues in isolated water supply zones. Action taken by the Company to increase water supply will come on stream in 2008-09 and increase the security of supply. We understand that additional strategic pipelines will be required to enhance the security of supply in smaller isolated water supply zones increase security of supply to acceptable levels.

6. We believe that an error in the calculation of target headroom results in the Security of Supply as calculated being over estimated.

14.1.2 Commentary on Company methodology

The Company has completed the Security of Supply Index using data from the Water Resources Plan prepared for Northern Ireland Water Service in 2002. Commentary on methodology adopted to complete individual column entries is given below.

The Company carried out a review of the water resource plan in 2007. Changes to WAFU identified in the update have been incorporated into the Security of Supply Index calculation.

The Company proposes to undertake a full update of the Water Resource Plan during 2009-10.

The Company has reported a SoSI of -26 which places it in the second worse position of all water service providers in the United Kingdom. The only Company in the worse position in terms of security of supply is the Folkstone and Dover Water Company. This area served by Folkstone and Dover. is designated by government as an area of water scarcity and compulsory water metering may be implemented as a means of controlling water use to balance demand with available supply.

From a review of the Water Resource Strategy of 2002, we understand that the low Security of Supply Index relates fragmentation of supply network, capacity of storage and the capacity of treatment. It does not relate to the availability water resources in Northern Ireland generally. In particular:

- The development of water resource and supply in the past has left a legacy of small water supply zones each with a limited numbers of sources. In some cases, a lack of

strategic connections between zones creates a dependency of single sources and limits the ability of the Company to move water in the event of a problem at any single source.

- The low SoSI score in some water supply zones relates to the capacity of the impounding reservoir which provides balancing storage for the zone. While these reservoirs are adequate sized for most years, they are expected to run dry in more extreme drought periods such as that seen in 1975. In many cases, this is the limiting factor on water available for use (WAFU).

- Lack of capacity at water treatment works. In the main, lack of treatment capacity is being resolved by current and future extensions to the major treatment works included in the Alpha PPP contract which will come on stream from 2008-09.

In its commentary, the Company has highlighted changes to supply which will improve the security of supply index in 2008-09.

14.1.3 Commentary on individual column entries including confidence grades

Confidence grades are not required for the security of supply index reported in Table 10A.

Column 1 The Water Resource Zones reported are consistent with the Company's Water Resource Plan of 2002.

Column 2 The estimated Water Available for Use (WAFU) has been taken from the 2002 Water Resource Plan. It is an estimate of the yield which could be abstracted from the various resources during drought conditions which was determined for each source over a range of historic conditions.

The WAFU is the deployable output based on hydrological assessments subject to two adjustments:

- Limitations from the capacity of the treatment works if fully operational.

- A reduction in treatment capacity to reflect the risk that a works or parts of a works will be out of service for periods of time (an outage allowance)

A detailed outage allowance was not carried out for the 2002 Water Resource Plan. An outage allowance of 3% was assumed for all sources.

Column 3 & 4 The Company does not report any bulk imports and exports.

Column 5 The dry year distribution input has been determined from the report year distribution input multiplied by a factor determined from the average to dry year input taken from the 2002 Water Resource Plan.

The calculation of a dry year adjustment factor is described in the Company's methodology. The factors used in the calculation are stated in the Company's commentary and are consistent with the 2002 Water Resource Plan.

The dry year adjustment factors are applied to the report year distribution input to determine the dry year distribution input. This assumes that the report year is a normal year. The dry year adjustment for Northern Ireland is

11.7%, higher than that reported by any of the ten water and sewerage companies in England & Wales for 2005-06.

Column 6 The reporting year distribution input is the same data reported in Table 10.

Column 7 The dry year available headroom is calculated within the table as WAFU less dry year distribution input.

Column 8 The target headroom is a planning allowance that a prudent water Company should allow between supply and demand to cater for uncertainties in the supply demand resource balance. Headroom increases the further forward the supply demand balance is projected, allowing for increasing risk over time.

A target headroom of 7.62% has been applied to all water resource zones. This is an interpolation of an assessment carried out for the 2002 Water Resource Plan. the headroom was determined for Northern Ireland as a whole and individual assessments were not completed for each Water Resource Zone.

The target headroom applied is a projection for the future and does not reflect the reduction in uncertainty which will apply to the present day.

The target headroom has been applied to the WAFU. The target headroom should have been applied to the dry year distribution input. Correcting this would marginally reduce the security of supply index.

Column 11 The mapped zonal population is equivalent to but marginally greater than the population reported in Table 7.

15 TABLE 11 – NON FINANCIAL MEASURES – WATER SERVICE ACTIVITIES

15.1 Key Points

1. New mains do not include mains installed at new developments developments.

2. Mains flushing are reported as the number of activities and not length as requested. NI Water does not record the length of mains which have been flushed.

3. NI Water does not replace lead communication pipes or flush pipes as part of an agreed quality programme. Lead communication pipe replacement are grouped and not separated as quality and other.

4. The Company has reported maintenance of service reservoirs under other service activities. Other investment in the water service did not meet the NIAUR reporting thresholds.

15.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement which was reviewed.

Our audit consisted of meetings with the Company. During the audit meetings we:

- reviewed the data sources used by the Company in the analysis;
- gained understanding of how the data was collected;
- on a sample basis confirmed how the source data was collected including visiting a regional office and interviewing a Field Manager to discuss how the mains bursts were logged;
- discussed how the Company had interpreted the lines;
- reviewed the confidence grades ascribed to the reported data by the Company.
- Reviewed and challenged the Company's methodology for reporting water service activities and confirmed the Company's report on a sample basis. The Company's working papers were reviewed against expenditure and QBEG allocation on the CIM template.

15.3 Table 11 - Blocks A to C – Asset Balance Over the Report Year

15.3.1 Commentary on Company methodology

The Company has reported changes to water mains from Engineering and Procurement contracts, with the main contribution coming from the mains rehabilitation programme. The Company was not able to report changes to water mains from the Operations capital programme including minor mains renewal and new development.

Information from individual projects was collated onto spreadsheets which were used to compile the return. We recommend that the data sheets are maintained and expanded as cumulative records over subsequent years. This will allow the Company to demonstrate that each report is comprehensive and mutually exclusive. It will allow any omissions to be identified in subsequent years. It will allow final project records to be checked to confirm the cumulative figures reported for a project.

The Company was not able to report the length of mains on new developments for the report year.

The final balance for water mains at the end of the report year is taken from the Company's GIS. It is not a balance of the preceding figures.

Further detail on the methodology is given with individual line commentaries below.

15.3.2 Commentary on individual column entries including confidence grades

Line 1 The length of mains is equal to that reported in AIR07.

We believe that a B3 confidence grade is reasonable.

Lines 2,6&7 The quantity of new mains under Line 6 is the total quantity from projects listed within the Capital Investment Monitoring sheet. The line entry does not include new mains laid to serve new properties and paid for by third parties and adopted by the Company. The length given will be an underestimate.

Otherwise, from our audit we were satisfied the length of mains renewed (pipe bursting or slip-lining), new mains and the length of abandoned mains was reasonable and complied with the definition. We audited two random samples in detail and the data collection method and calculation was reasonably thorough.

The A1 confidence grade for mains renewed assumes that almost all mains renewal and abandonment projects are captured. We believe that an A2 confidence grade would be appropriate.

We recommend a C5 confidence grade for new mains until new mains for development are included in the reported figure.

Line 3 NI Water note that it does not reline pipes using the spray applied lining method. From our sample audit we confirmed that mains were refurbished by either pipe bursting, slip-lining or replacement.

We note that similar companies in England & Wales use spray applied linings to rehabilitate water mains contributing to water quality failures which are in reasonable structural condition.

Lines 4 The Company could not identify the length of mains flushed. The value entered in Line 4 is the number of flushing exercises carried out.

We understand that the Company is considering attaching a flow meter to the standpipe to determine water lost during flushing for the water balance.

We recommend a D6 confidence grade until the Company is able to report a length flushed.

NI Water advised it has not carried out main cleaning by means other than flushing.

Line 5 We understand that it is NI Water's policy to replace mains which cause water quality failures. The Company has reported no lengths cleaned for quality reasons

Lines 8 to 10b. The Company has not distinguished between communication pipes replaced for quality and communication pipes replaced for maintenance or other reasons.

The Company does not have a quality programme for replacing lead communication pipes. The Company has adopted almost universal ortho-phosphoric acid dosing to address the risk of plumbosolvency. Lead communication pipes reported were replaced due to works on the relevant main or due to bursts on the communication pipe.

The Company advised that their standard procedure when rehabilitating a main was to replace all communication pipes (lead or otherwise).

The communication pipes are replaced by either the Engineering and Procurement (E&P) team or the Networks Water team. From our sample audits we found that the E&P team had a reasonable system in place to record replacement communication pipes. The Networks Water team also had a reasonable system but the system has changed two times over the past year as they implemented a new database system. Because of this, confidence in the Ops records is lower.

Line 11 Mains bursts

The Company has complied with the revised definition of this line (revised from the Ofwat March 2007 definitions). The Company defines a mains burst as work that requires the section of main which includes the defect to be isolated. Because of this NI Water excludes work on valve packing, hydrants and air valves.

The Company's definition does include the ferrule connection to the main where the ferule defect can not be fixed without isolating the main. The Company has not distinguished ferrule failures that are attributable to mains material condition or local ground movements (which should be included in the report) from incidents of ferrule failure due to ferrule materials or poor workmanship, or associated with the communication pipe connection (which should be excluded from the report).

NI Water notes in its commentary that it reports the number of mains repairs and not strictly mains bursts. If the Company fix more then one burst under the same work order then it will be counted as a single repair and reported as a single burst. This under reporting is unlikely to be material.

We audited the number of bursts from each region provided by Networks Water and interviewed a Field Manager to gain a good understanding of their system. From this we found that a reasonable reporting system is currently in place. We did find that during the report year there were at least three changes to the reporting method and data storage system. These changes could lead to under reporting of mains bursts. We did not audit the number of bursts reported by the leakage team this year.

Line 11 The Company has entered the total length of potable water mains from their NIMS Mapinfo GIS database. The line definition asks for the sum of lines 1, 2 and 6 less line 7 which equals 26087 km. Therefore the balance reported by the Company is 19.9km less than the reported changes would indicate.

NI Water advise they do not have any partially treated water mains for fire authority or industrial use. Raw water mains (aqueducts) are not included in the line. The GIS system identifies 287km of raw water aqueducts.

15.4 TABLE 11 - BLOCK D – DISTRIBUTION STUDIES

We have reviewed the status of NI Water's Distribution Studies programme and confirm that the numbers reported accurately reflects their current position

The confidence grades reflect the degree of accuracy in the number of studies that have been complete and the percentage of the area covered, and in this the grade of A1 is appropriate.

We have reviewed the zone studies specification. The specification used for the zonal studies has been developed over a number of years and has been audited on a number of previous occasions.

For the audit we reviewed the zone study for Bangor Town and the underlying model. We specifically reviewed the calculations for Grange DMA.

The needs and options identified in the zone reports appear to be consistent with the specification and the identified procedures have been followed.

While our audit makes us believe the distribution studies are carried out to a reasonable standard we do have some concerns over the specific modelling issues identified below. We would recommend that appropriate demand profiles are used in the working models.

The demands in the working ADD and ADPW models are based on the calibration year. Our previous experience is that the demands adopted in working models are normally based on the highest recent demand year, which is not necessarily the calibration year.

Applying overall factors to convert demands from calibration day to ADD and ADPW could cause distortions in the profile, especially for ADPW, at maximum demand. The effect is that the typical evening increase in demand is weighted towards the morning peak. This can produce higher flows in the system at this time and could result in lower pressures being predicted.

15.5 Table 11 - Block E – Other Water Service Activities

15.5.1 Commentary on the Company's Methodology

The Company has reported water service activities for water treatment works and service reservoirs only.

The Company has based its report on expenditure exceeding the reporting threshold values in the report year.

The Company has not tested whether projects reported against expenditure of £100k exceeded 10% of the GMEA value of the asset.

The Company has based its allocation on expenditure in 2007-08 only and has not taken account of previous expenditure by NI Water Service on projects completed in the report year.

The Company has reported against projects where total expenditure exceeded £100k in the report year. Projects reported against quality or maintenance categories might not have exceeded the £100k expenditure limit for that purpose. For example, Clay Lake WTW is included in the report of water treatment works under lines 20 and 21 (maintenance) and lines 22 and 23 (quality). Expenditure reported for the year was £788 k. The allocation to base maintenance is 6% (£47 k). While total expenditure exceeded the £100 k threshold, expenditure allocated to maintenance did not.

The reporting requirements note that for projects which spand more than one year the Company should report activity in the report year when cumulative expenditure in the relevant project breaches the threshold. This has not been an issue in the report year which is based on expenditure by NI Water in 2007-08 only. In most instances the projects reported are complete. However, for future years, NI Water will need to maintain a cumulative record of projects reported to ensure that duplicate reports are not submitted.

15.5.2 Commentary on individual lines including confidence grades

Line 18 The Company defines aqueducts as un-pressurised pipes carrying raw water. We believe that pressurised pipes conveying raw water could also be included in this category.

NI Water advised us that raw water aqueducts sometimes include "compensation pipes" which supply cattle troughs.

The Company reports that it did not undertaken projects on aqueducts where cumulative expenditure exceeded £100k in the report year.

Line 19 The Company reports that it did not undertaken projects on substantive work on the refurbishment of dams and impounding reservoirs where cumulative expenditure exceeded £100k in the report year.

Lines 20 & 21 The Company reports capacity of refurbished water treatment works for maintenance in line 21 for 5 water treatment works. The reported number was omitted from line 20.

This report includes projects where total expenditure in the report year exceeded £100 k but expenditure allocated to maintenance was less than £100k. We believe that these projects should be excluded from the report.

Line 22 & 23 The Company's report of 5 projects for new or enhanced water treatment works for quality is consistent with our audits of the capital investment programme and the CIM. It includes one project where work on sludge dewatering plant has been allocated to quality.

Line 24 The Company has identified one pumping station refurbished for maintenance. Expenditure on the project was £151 k in the report year with further expenditure expected in 2008/09. However the CIM indicates that the projects is currently allocated to quality and growth and does not include expenditure on asset maintenance.

Lines 25 The Company has reported 13 service reservoirs refurbished for maintenance. Major service reservoir refurbishment is carried out under area projects each covering a number of assets. The Company has identified individual assets within these area projects where expenditure exceeded £100k in the report year.

Line 26 The Company has not reported on the number of household meters renewed in the report year. We understand that no household meters were renewed.

Line 27 The Company reports that it did not undertaken projects on security relate improvements where cumulative expenditure exceeded £100k in the report year.

Line 28 The Company has not completed theses lines relating to environmental impact, option appraisals or improvements.

16 TABLE 11A – NON FINANCIAL MEASURES – WATER SERVICE SERVICEABILITY INDICATORS

16.1 Key Points

1. The reported data is for the 2007 calendar year.

2. The assessment is based on mandatory sampling and testing carried out by the Company and reported to the DWI.

3. The Company has adopted a simplified methodology of assessing the 95%-ile of the data using Excel spreadsheet routines.

4. The Company has no proposals for any new performance indicators for this group of assets.

5. We have noted differences in the number of treatment works reported in the table and the commentary. The Company has advised us that the total number of treatment works reported in the Table should be 42.

6. PPP concessions were not responsible for water service activities in the report year. The Alpha PPP concession will deliver water into supply from 2008.

16.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of one meeting with the Company. During the audit meeting we:

- reviewed the data sources and assumptions used by the Company in the analysis;
- confirmed that numbers and outputs of treatment works and numbers of turbidity exceedences could be reconciled with the base data;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement expect as set out in the Company's commentary;
- reviewed the confidence grades ascribed to the reported data by the Company.

16.3 Comments on Methodology

WTW samples are taken by NI Water, on a frequency agreed with DWI, and tested in NI Water's accredited laboratories. The data are held by NI Water in a spreadsheet and a monthly summary report is provided by NI Water to DWI. The DWI does not receive details of individual samples unless they specifically request them. Exceedences are notified to DWI immediately. The monthly report is followed up by a monthly progress meeting where performance and other issues are discussed. DWI has also carried out audit of laboratory procedures.

Data on distribution input are provided by the Company's Leakage Section, based on average daily flows into distribution. The figures reported in Table11A are based on calendar year 2007, the figures reported in Table 10 are based on the report year and are marginally different.

The Company's spreadsheet also includes all sample results for each WTW, with dates recorded. These data are abstracted from the Laboratory Information Management System database (LIMS). Only scheduled samples are included are included in the analysis. Samples taken for operational reasons, of which there are very few, are excluded from the analysis.

Sites which have no samples for a period of more than 28 days are excluded from the analysis. The data set is normalised for samples below the lower limit of detection, by entering a surrogate value of 0.5 of the lower limit and 95%iles are calculated. Works with a 95%-ile greater than or equal to 0.5 NTU and 95%ile less than NTU were identified. Numbers and outputs are then summed to produce the line entries.

The 95%ile figure is calculated using an Excel spreadsheet routine, rather than the first-principles method set out in the Reporting Requirements. We believe that this will have a negligible effect on the reported data

16.4 Comments on Line Entries

Compliance with the methodology described above was confirmed by sample checks and the data for 4 treatment works selected at random were examined in more detail to confirm compliance.

The number and outputs associated with exceedences was reconciled with the base data. The total number of works and total output were also reconciled with the base data. There are no sites where turbidity is not recorded and in the report year there were no sites with data gaps of over 28 days. All of the sites reported were operational for the whole year, with only very short gaps in outputs being required for essential maintenance. It was confirmed that only scheduled samples are used in the analysis.

The base data were compared with the data in the Annual Water Quality Report (AWQR). The AWQR reports 9471 turbidity samples for the year, whereas the summary table provided by NI Water at the time of the audit listed 9274. Upon examination during the audit this difference was reconciled as being due to samples taken at Mourne/Ards Borehole at Whitespots, where Ards borehole water is resampled. This was corrected by adding the Mourne/Ards Borehole at Whitespots sample results to the analysis for the source. Table 11A was adjusted to suit.

16.5 Comments on Confidence Grades

The allocated confidence grade of A2 is supported. The data are held in auditable corporate systems. The accuracy component of 2 reflects the accuracy of the original measurements.

17 TABLE 12 – NON FINANCIAL MEASURES – WATER EXPLANATORY FACTORS

17.1 Key Points

1. In 2008/09 the Alpha PPP concession covering will be commissioned covering 5 existing water treatment works.

2. The average head calculation includes data from the Northern and Southern regions only, covering 41.9% of properties.

17.2 Table 12 - Block A – Source Types and Pumping

17.2.1 Commentary on the Company's methodology

The reported data was abstracted from a list of sources and treatment works on an in-house Operational Management Information System (OMIS) which includes information on flow data through source and treatment. This listed the number of impounding reservoirs and river abstractions.

Flow information used in the analysis was consistent with information used for the water balance. The Company does not have bulk imports or exports.

The reported data includes works which are being incorporated into the Alpha PPP contract due to come on stream in 2008-09.

17.2.2 Commentary on individual lines including confidence grades

Line 1 The number of impounding reservoir sources has reduced from 20 reported in 2006-07 to 19 reported in 2007-08. The Company advised us that the change is due to the impounding reservoir at Lough Island Reavey being replaced by a raw water pumping station. Lough Island Reavy now pumps to Drumaroad reservoir and under the reporting requirements the two are classed as one source.

Line 3 The number of borehole sources reported has reduced from 27 in 2006-07 to 22 in 2007-08. The Company has identified 5 borehole sources out of service in the report year.

The OMIS data identified twenty two boreholes sources which are reported for line 3. The Ballycullen borehole field includes seven individual boreholes which the Company has counted as individual sources. This is counted as one source under the NIAUR definitions.

The figures used to allocation distribution input by proportion in Table 12 are marginally different from the distribution input reported in Table 10. We do not consider the impact to be material. We recommend that the Company uses a single source of consistent data for future returns.

17.3 Table 12 - Block A – Average Pumping Head – Total

The Company has described the sources of data used to determine the average pumping head in its commentary.

The average head calculation appeared reasonable and followed the definition. The data used is partly from zonal studies and partly provided by works operators.

NI Water has completed the average head calculation from pumping stations located in its Northern and Southern regions only. The area included in the calculation covers for 41.9% of the properties served by the Company. The Northern and Southern regions so do not include the large supplies to the significant urban populations in the Eastern region (Belfast). The calculation might not be representative of the Company's complete area.

The average head calculation includes less than half the properties supplied. Due to the unknown head and flows to the remaining properties we recommend a confidence grade of C5.

17.4 Table 12 - Block B – Treatment Type

The Company provided a breakdown of the treatment types for the various works. The Company demonstrated how they had confirmed the treatment type with the works operatives for completion of the Lines. The treatment types allocated appeared to agree with the NIAUR definition. The treatment type is not held on a central database.

17.5 Table 12 - Block C – Potable Mains

The potable main length broken down by diameter was obtained from the NIMS Mapinfo GIS database. The length is consistent with the water mains asset balance at 1 April 2008 reported in Table 11.

We believe that the methodology adopted to abstract the information from the GIS systems is reasonable. NI Water has noted that 157 km of pipe with unknown bore on the GIS is included in Band 1. We consider this assumption to be reasonable on the basis that an unknown diameter is more likely to be small than large. Further work considering the diameters of upstream and downstream pipe diameters would improve confidence in this assumption.

18 TABLE 13 – NON FINANCIAL MEASURES – SEWERAGE PROPERTIES AND POPULATION

18.1 Key Points

1. The Company has based the number of properties connected to the sewerage service on the number of properties connected to the water service subject to simple adjustments.

2. The Company has assumed that 84% of occupied household properties supplied with water are connected to the sewerage service. The Company has assumed that 89% of occupied non-household properties supplied with water are connected to the sewerage service.

3. The factors applied are based on the analysis of connected properties by NI Water for the 2008-09 Scheme of Charges.

4. In the report year NI Water only billed measured water supplies. Other references to billed properties refer to estimates of occupied properties connected to the sewerage system.

18.2 Commentary by Individual Lines including Confidence Grade

Lines 1 &2 We have not audited these lines for this return.

Line 3 The number of households billed unmeasured sewage is 84% of the number of households billed unmeasured water reported in Table 7 Line 3.

Based on the quality of the underlying data we believe a confidence grade of C4 is appropriate.

Line 4 The number of households billed measured sewage is 84% of the number of households billed measured water reported in Table 7 Line 4

Households billed measured water are metered farm properties which have a domestic element as identified on the Company's Rapid Xtra system using property flags derived from the Northern Ireland Water Service HiAffinity billing system.

We believe that these properties should be reported non-households billed measured and the population allocated accordingly.

We believe that a significant number of farm properties will have septic tanks and will not discharge to the sewerage system. We recommend that property records are reviewed to confirm, as best as can from LPS data, which of these properties discharge to the sewerage system.

In view of the fact that the properties reported in this category are farms served by septic tanks, we recommend a confidence grade of D6.

Line 5 The total households billed measured properties is the sum of preceding lines calculated within the table.

Line 6 The Company has assumed that 89% of the billed unmeasured non-households reported in Table 7 Line 8 are connected to the sewerage system.

In view of the uncertainty over issues reported under Table 7 such as test meters, potential site meters, we recommend a confidence grade of C4.

Line 7

The Company has assumed that 89% of the billed measured non-households reported in Table 7 Line 9 are billed for sewerage services.

We understand that there are categories of billed measured supplies including supplies to cattle troughs which do not have a return to sewer. The Company records 42,699 measured non-household supplies. The Company billing records currently identifies 12576 cattle trough supplies and 75 cross-border supplies which will not connect to the sewerage system. This suggests that the measured supplies connected to sewer should be less than 30,000 compared to the 38,002 reported. We recommend that measured water supplies not returned to the sewerage system are identified and excluded from the reported figures.

Billed measured non-household supplies include a category of "site meters" where the supply to a group of properties (say an industrial estate or shopping centre) are served through a common meter owned by the landlord with the supply of water to individual properties included with the rental agreement. For AIR08 only the primary supply meters are counted for properties connected to the water supply and the same approach has been taken when determining the number of properties connected to the sewerage service.

In view of the uncertainty over issues reported under Table 7 such as test meters, potential site meters, and the inclusion of properties known not to return to sewer, we recommend a confidence grade of C5 for billed measured sewerage.

Line 8

The total number of billed non-households is the sum of lines 6 and 7. In view of our comments above we recommend a confidence grade of C5.

Line 9

The number of void properties was determined from the total number of household properties connected to the water supply factored by a void ration determined from the NISRA housing Statistics Report and factored by 84% to reflect the number of properties connected to the sewerage service. A further allowance was made for commercial voids.

We believe that a confidence grade of C4 is reasonable.

Line 10

The estimated population connected to the sewerage system is determined from the number of properties connected to the sewerage system including population in non-households identified in Table 7. An estimated 86% of the population in Northern Ireland is reported as connected to the sewerage system. This is consistent with the number of properties assumed to be connected.

19 TABLE 14 – NON FINANCIAL MEASURES – SEWAGE COLLECTED

19.1 Key Points

1. The Company assumes that 95% of water delivered (including supply pipe leakage) is returned to sewer. This is consistent with similar returns made by companies in England, Wales and Scotland.

2. The Company assumes that 84% of water delivered to households and 89% of water delivered to non-households is returned to sewer based on an assessment of the proportion of properties connected to the sewerage system. These assumptions differ from the assumptions used to determine the number of properties connected to the sewerage system reported in Table 13.

3. The Company applies it standard assumptions to the estimated domestic component of water delivered to farm houses through metered supplies to complete line 4. It is likely that the majority of farm properties are served by septic tanks and do not return wastewater to sewer.

4. Trade effluent is based mainly on measured volumes determined from metered water supply. The reported volume is 64% greater than the volume projected for 2008-09 in the Scheme of Charges.

19.2 Table 14 - Block A – Sewage Volumes

19.2.1 Commentary on the Company's methodology

The Company has assumed that 95% of water supplied is returned to sewer. This assumption is common across the water industry in England Wales and Scotland.

The Company applies the 95% adjustment to the water delivered including supply pipe leakage. Supply pipe leakage typically represents 14% of water delivered to unmeasured household properties. We are not convinced that this water will be returned to sewer although it does contribute to groundwater which may be returned as infiltration. The assumption that supply pipe leakage is included in the calculation of return to sewer is consistent with the equivalent reports in England Wales and Scotland.

The Company has allowed for 84% of domestic properties and 89% of non-household properties to be connected to sewer based on an analysis of customer data based on customer data derived from Land & Property Service data. The percentages are consistent with the assumptions made to determine number of properties connected to the sewerage system in Table 13.

The calculation of water returned to sewer assumes that water returned to sewer will be in proportion to numbers of properties connected. We would expect that larger users are more likely to be connected to sewer resulting in a higher volume returned to sewer than estimated. Further work could also be done to align water supplied with the assessment of trade effluent discharges to improve the quality of the calculated volume returned to sewer.

The volume of trade effluent reported for 2006-07 was based on consented volumes of trade effluent. For 2007-08 the trade effluent volumes reported are based mainly on the measured water consumption. The Company has advised that they have water supply meters on all

properties discharging trade effluent. The Company has identified software difficulties which have prevented them confirming all the trader flows from the meter readings. Where the meter readings are unavailable NI Water has defaulted to the maximum discharge consent. Approximately 7.3% of the reported flow is determined from the consented allowable maximum flows. There are likely to be some further change in reported trade effluent as these difficulties are resolved.

For the majority of traders the trade effluent is considered to be the volume of flow measured through the incoming potable water main less a domestic allowance of 50 l/s per person employed at the premises where there is a canteen and 25 l/s per person if not.

19.2.2 Commentary by Individual Lines including Confidence Grade

Line 1 The volume of unmeasured household sewage is based on the volume reported in Table 10 line 4 (306.61 Mld). The reported volume returned to sewer is calculated by applying the 95% and 84% factors commented on above.

We believe that the reported volume should include the volume reported against measured households in line 4. In view of this we recommend a confidence grade of C4.

Line 2 The volume of unmeasured non-household sewage is based on the volume reported in Table 10 line 5 (24.48 Mld). The reported volume returned to sewer is calculated by applying the 95% and 89% factors commented on above.

The assessment of unmeasured non-household water delivered is determined from water delivered to other properties through metered supplies. In view of this and other assumptions used to derive this figure we recommend confidence grade of C4.

Line 3 This line is derived by summing lines 1 and 2.

Line 4 The volume of unmeasured non-household sewage is based on the volume reported in Table 10 line 1 (14.76 Mld). The reported volume returned to sewer is calculated by applying the 95% and 84% factors commented on above.

The reported volume relates to the estimated domestic component of water supplied to farms through metered supplies. It is likely that the majority of farm properties are served by septic tanks and the return to sewer will be much less than reported. Based on the methodology used by the Company, the estimated volume is likely to be returned to sewer but from unmeasured households and should be included in Line 1.

Based on the above observations, we recommend a confidence grade of D6.

Line 5 The volume of measured non-household sewage is based on the volume reported in Table 10 line 2 (124.68 Mld). The reported volume returned to sewer is calculated by applying the 95% and 89% factors commented on above and deducting the volume returned as trade effluent.

The volume of water delivered in this category includes volume delivered to cattle troughs. These form almost 30% of the metered water supplies.

Further data analysis would allow the volume supplied by properties connected to the sewerage system to be identified and the estimate of volume returned improved.

In view of the assumptions used to estimate the volume returned to sewer we recommend a confidence grade of C4.

Line 6 The assessed volume of trade effluent has reduced significantly from 36.49 Mld for 2006-07 to 26.25 ml/d for 2007-08. The 2006-07 figure was based on the consented volume. The 2007-08 figure is mainly based on measured water supply subject to a deduction of a domestic allowance.

The reported figure is 64% greater than the estimated volume of trade effluent used for 2008-09 in the tariff model. The Company has noted that the volume used in the Scheme of Charges was taken from the billing systems and the volume reported in this line is abstracted from Asset Management systems. We recommend that the Company investigates and clarifies the difference and considers the impact, if any, on treatment works loads and size bands.

Line 7 The total volume returned to sewer is the total of the preceding entries. We believe that the reported data is on the limit of a C3 confidence grade.

20 TABLE 15 – NON FINANCIAL MEASURES SEWAGE TREATMENT

20.1 Key Points

Trade effluent load

1. The reported trade effluent load has reduced from 26316 t.BOD/year in 2006-07 to 4920 t.BOD/a in 2007-08. In 2006-07 the Company reported the consented traded effluent load. In 2007-08 the Company reported the measured trade effluent load.

2. The measured trade effluent load reported in 2007-08 is approximately 19% of the consented load. We recommend that the Company reviews the consented loads to ensure that they are necessary to meet the needs of traders. We are concerned that investment in works might be dictated by levels of consented trade effluent which are not used and are not reflected in the Company's income.

3. Trade effluent is charged partly on measured COD. As a result it is not possible to make a direct comparison between the trade effluent BOD load reported in the AIR08 and the trade effluent billed. However, from our audit, we believe that reported figure is consistent with trade effluent load included in the Tariff Model for the Scheme of Charges in January 2008.

Sewage loads receiving treatment

4. While we have commented on the age of some of the data used to determine sewage treatment loads, we note that the total load is reasonably consistent with the reported figures for population served, trade effluent load and volume of measured water returned to sewer.

5. Data on loads rely heavily on NIAMP2 data, with some more recent updates. Trade effluent loads have been added using mix of consented or measured values. The source data was not available for audit. In the absence of data we were not able to confirm the detail of some loads included in the return. We recommend that NI Water updates its analysis of treatment works loads and develops appropriate systems to allow the loads to be updated periodically.

6. NI Water has advised us that the sewage treatment loads used in the AIR08 are consistent with the population equivalents agreed with EHS in November 2007 for the purpose of determining the effluent sampling regime for 2008-09.

Sludge disposal

7. The Company estimate of sludge quantities is based on a combination of measurements and estimates of sludge volume or mass and solids content. The overall estimate is reasonable. The introduction of new systems of measurement may further improve confidence in the reported data for future years.

8. The Company reports that there was no unsatisfactory sludge disposal in the report year. The Company provided sample information to demonstrate that it maintained records to demonstrate satisfactory compliance.

9. The estimate of additional sludge arising due to quality obligations since 2005/06 is based on the difference of two estimated quantities based on partly on assumed solids contents. Our confidence in the reported difference is low.

10. The total estimated sludge quantity of 38.4 ttds includes sludge from the PPP plant at Kinnegar and commissioning work at the new North Down PPP plant disposed of through the Belfast incinerator.

20.2 Table 15 - Block A – Sewage Loads

20.2.1 Approach to audit

During the audit of trade effluent we met with Company staff to review the processes of measuring and recording trade effluent volume and load. We obtained a copy of figures for individual trade effluent discharges totalling to the reported figures. We reviewed the detail of two example trade effluent discharges to confirm that detailed supporting information was available including allowances for product water and domestic usage. We asked for the equivalent trade effluent load billed as measured COD to and confirmed that this was consistent with the reported load in the AIR08. We confirmed that the measured BOD was consistent for the figures reviewed during the interim principal statement in January 2008.

20.2.2 Commentary on Company methodology

Trade effluent

In the previous year the Company reported the total consented trade effluent load. In the report year the Company has reported it best estimate of trade effluent load discharged to sewer.

The reported figures are for all trade effluent discharged to sewer. The Company has not identified and reported the load discharged to works providing secondary treatment.

The trade effluent for large traders is based on measured flow and measured BOD. A conversion factor between COD and BOD is not used.

For approximately 7.3% of traders the flow is based on the maximum consented flow. We understand that this is due to software issues and should be corrected for AIR09. It is likely that this will lead to a further reduction in trade effluent load.

Traders are split between “sampled and charged” and “standard charge”. Where traders are consented to deliver waste that is similar to domestic sewage the waste is not tested on a regular basis and a standard BOD strength is assumed.

Trade effluent loads include leach ate tankered in from landfill sites. This is counted in tanker loads and is not measured. Effluent from these sources is currently reported as the maximum consented concentration.

Sewage treatment loads and sewerage service facilities

The Company's analysis of sewage treatment loads is based on a list of 1084 treatment works of which 194 are in size bands 3 and above.

The treatment works data used in the analysis is the same as that used to prepare the Company's report on Table 17D.

The treatment works loads rely heavily on NIAMP2 data which was compiled in 2001-2. The NIAMP2 assessment covered works whose population equivalent was thought to be 250 or greater.

The number of domestic properties served by each works was estimated from MapInfo data supported by manual checking. Occupancy rates from the 2000 Water Resources Strategy Report were then applied to the number of properties to assess domestic population with differing rates used for each District Council area. Domestic population load was assessed using an equivalent load of 60g BOD/hd/day.

The tourist population was assessed using information on numbers of caravans and caravan pitches provided by site owners, with an occupancy rate of 3. The load was then assessed using an equivalent load of 60g BOD/hd/day.

Non-domestic buildings (such as schools, churches, nursing homes etc.) were identified from MapInfo and occupancy rates assigned to each depending on type. A check was made on measured water users to eliminate double-counting and p.e assigned at a rate of 1 p.e per 145l/hd/day.

Non-consented trade flow was added at a rate of 12.5% of the domestic p.e . In all of these cases the load was then assessed using an equivalent load of 60g BOD/hd/day.

Trade effluent flows were added to the load. Loads based on NIAMP2 data include consented trade effluent. More recent updates are based on measured trade effluent load at the time the estimate was updated. Where consented loads are used they are likely to lead to an overestimate of total load.

Allowance was made for imported flows, such as imported sludge liquors, leachate and septic tank waste, which are metered on discharge to a WWTW. It is believed that standard strengths, rather than actual measurements of strength, were used in these calculations.

It is not known whether private septic tanks were excluded from the assessment of septic tank waste. We understand that the Company has reported private septic tank emptying as a un-regulated business stream. We recommend that the Company and the Utility Regulator review whether private septic tank loads should be included in sewage loads. As outlined in Table 22, we believe that the Company needs to assess the cost of operating treatment facilities to treat imported private septic tanks loads and exclude this operating costs from the regulated business accounts.

Imported sludge liquors were included in the assessment. We recommend that imported liquors are excluded from the reported load as they arise from loads received at other treatment works and the incoming load has already been counted at the source works.

A specific separate assessment was made for one works – Seagate – which treats only effluent from a large electronic component plant.

In 2004 a review of the NIAMP2 data was carried out. This took in new information arising from project appraisals, the effect of significant new developments including on-site house-counts, changes in trade effluents and reviews of works where it was believed that changes would result in works moving to another size band. The effect of this review was to update the base data; the same calculation methodology was used.

In 2005/6 an assessment of p.e was made for works categorised as serving under 250 population. Works were deemed to fall into this category if they did not appear on the public register. Numbers of domestic properties were assessed using MapInfo data and an occupancy of 3 allocated to each. The load was then assessed using an equivalent load of 60g BOD/hd/day. No allowance was made for any other flows.

Some works have been individually reviewed where significant changes have taken place, such as development or the closure of a works with flows being pumped away to another works.

The data used for the calculation of load in AIR08 are thus a mixed set consisting of

- NIAMP2 data
- 2004 updates
- the 2005/6 exercise for smaller works
- Individual site reviews

The Company recognises the mixed provenance of these data and the fact that they are aging and becoming less reliable. We understand that work is being carried out on behalf of NI Water to construct a growth model is reviewing catchment boundaries, beginning with the most critical works, and it is hoped that this exercise will extend to all works over 250 p.e. It is also recognised that the components of the calculation of load which depend on the assessment of p.e are estimates and no checks on works influent strength or flow have been carried out.

We have not been able to audit the sources of the data and cannot confirm whether it is reliable.

It is recommended that NI Water takes steps to update and improve the consistency of data used to assess p.e and to store it in a single, reliable corporate database.

20.2.3 Commentary on individual line entries including confidence grades

Line 1

The trade effluent reported is the measured trade effluent discharged in the year. The quantity reported in the previous year was the consented trade effluent quantity.

The trade effluent quantity reported is all trade effluent discharged. The Company has not separated out the trade effluent load to secondary treatment.

Part of the load is reported on the basis of consented volume as opposed to actual volumes.

A minor element of the trade effluent load is based on assumed strengths rather than measured strengths.

Notwithstanding these observations, much of the reported load is based on measurements throughout the year which is consistent with practice across the industry.

On the basis of these observations we consider the data to be at least on the limit of an accuracy grade of 3 (10%). Until the issues identified above are resolved, we recommend a confidence grade of C4.

Lines 2 to 6 The data is abstracted directly from the loads spreadsheet described above. During the audit sample checks were carried out and demonstrated that information had been consistently compiled.

The Company report a confidence grade of C3 for sewage loads and population equivalent. In view of our concerns regarding the age of the data and the ability of the Company to reported connected properties and trade effluent, we recommend a confidence grade of C4 for this data.

20.3 Table 15 – Block B - Designation of Works Type

Data held for each works records the works type. Treatment type was established for works with p.e. over 250 during the preparation of NIAMP2. A guidance document was prepared by NI Water and used during site surveys of each works to determine and record works type. This exercise was later carried out for works with p.e under 250 using the same method. Changes and closures are notified by Engineering and Procurement following capital projects.

During our audit the Company was able to demonstrate updates to the designation of works type and demonstrate that the treatment capacity information was consistent with the works flows and loads identified above.

The Company reports an accuracy grade of 3 for the load and equivalent population data in this section. In view of our concerns regarding the age of the data and the ability of the Company to reported connected properties and trade effluent, we recommend an accuracy grade of 4 for this data.

20.4 Table 15 - Block C – Sewage Sludge Disposal

20.4.1 Approach to the audit

During the audit we:

- Reviewed the Company's methodology.
- Met with Company staff responsible compiling the information and for managing sludge handling, recycling and disposal across Northern Ireland.
- Reviewed the summary data used to compile the return.
- Visited one sludge treatment centre to confirm the methodology used to compile sludge quantities for that centre.
- Reviewed supporting documentation to confirm the satisfactory recycling and disposal of sewage sludge in the report year.

20.4.2 Commentary on the Company's methodology

Sludge outlets

In the report year the Company has recycled or disposed of sludge through 5 outlets:

- Through incineration at Duncrue Street, mainly catering for sludge in the greater Belfast area but also for sludge from other areas.
- By recycling to forestry, mainly catering for sludge produced in the south and west of Northern Ireland.
- By recycling digested sludge from Newtownbreda WwWT to agriculture.
- By recycling a small quantity of sludge to willow plantation in the early part of the year only.
- By disposal to landfill when other routes are not available.

Key developments which will affect sludge recycling and disposal outlets in future years are:

- Completion of the second incinerator at Duncrue Street under a PPP concession. The existing and new incinerators will provide the long term sludge disposal outlet for Northern Ireland.
- In the short term, the potential loss of recycling to forestry as a sludge outlet. We understand that EHS are considering withdrawing the waste management exemption licence required to permit sludge recycling to forestry. The loss of this outlet will require NI Water to find alternative disposal outlets until the new incinerator comes on stream.

Estimate of sludge mass

The mass of sludge disposed of is the product of estimated wet volume or wet weight and the estimated dry solids content at key export or treatment centres.

In the report year the Company has increased measurement of dry solids content for sludge cake, improving the reliability of the reported total sludge mass exported. The Company has also measured the dry solids content of the liquid sludge feed to the incinerator.

The mass of dewatered cake is generally taken from weighbridge measurements. During our audits we noted that the weighbridge at one site visited had not been operational for part of the report year. While the weighbridge was out of action, the mass of sludge was estimated on the basis of vehicle movements using an average load derived from measured data.

Almost half the sludge incinerated (22% of total sludge) is fed to dewatering plant at the incinerator as liquid. The volume is not measured and a nominal daily feed volume of 900 m3/d is assumed based on the capacity of the design capacity of the plant. While the overall mass disposed of appears reasonable, the lack of a direct measurement of the feed rate introduces additional uncertainty into the reported data.

During the report year the Company also exported dewatered cake from the incinerator site to forestry. This quantity has been accounted for on the basis of measured weight exported from the site.

We understand that the Company is in the process of introducing a new sludge management system based on sludge loggers and weighbridges at the main reception and collection centres. The system will include global positioning system tracking of vehicle movements. This will allow the Company to automate its records of sludge quantities moved between collection and reception centres. It will assist the Company in the management of its records of sludge movement and the management of sludge transport contracts. Subject to suitable calibration of measurement devices, it should improve the reliability of reported sludge quantities.

Sludge quantities arising from new obligations

The additional quantity of sludge arising from new obligations is based on:

- 10 major works which have been upgraded since 2005/06 with either additional treatment stages or substantial replacement of existing treatment processes.
- The volume or mass of liquid sludge or sludge cake measured at the works in 2005/06 converted to dry sludge solids content on assumed dry solids content of 4% for liquid sludge and 24% for dewatered sludge cake.
- The volume or mass of liquid sludge or sludge cake measured at the works in 2007/08 converted to dry sludge solids content on assumed dry solids content of 3.17% for liquid sludge and measured sludge solids content for dewatered cake.

The solids contents used for 2005/06 are assumed and not measured data. The liquid sludge solids content used for 2007/08 is the average solids content for liquid sludge fed to the incinerator in 2007/08.

In some cases the measured sludge quantity exported from the works considered in the assessment will include a quantity of imported sludge. In some cases these imports will have reduced or stopped during construction and this may be reflected in the estimated change in sludge quantity.

The estimated additional sludge quantity will include any growth in population from 2005/06 to present.

The lack of a robust measure of sludge produced in 2005/06 at the selected sites and the use of assumed liquid sludge solids content for individual sites for 2007/08 results in a lack of confidence in both the current and historic sludge quantities. We believe that the reported difference between these two estimates is unreliable.

We suggest that, in the absence of a robust measured baseline, the Company should consider validating the change in sludge quantity due to new obligations against theoretical calculations of sludge production. While this will not be accurate, it is likely to give a more robust estimate than the methodology currently used.

The Company reports that all sludge was disposed of satisfactorily in the report year.

NI Water advised us that the main regulatory bodies involved in monitoring sludge disposal are:

- The Alkali & Radiochemical Inspectorate in respect of sludge incineration.
- The Environment & Heritage Service in respect of sludge recycling to forestry.

The Company provided copies of the waste management exemption licences relating to recycling sludge to forestry.

The Company provided sample reports of emissions monitoring from the sludge incinerator. This indicated that the Company had complied with its consent conditions.

The total quantity of sludge reported (38.4 ttds) includes sludge generated by the PPP works at Kinnegar and from the start up of the North Down scheme which were disposed of through the Belfast incinerator.

20.4.3 Commentary on individual lines including confidence grades

Line 14 The Company reports that there was no unsatisfactory sludge disposal in the report year.

Line 15 The total quantity of sludge produced in the report year is based on a combination of measurements and estimates. We recommend a B3 confidence grade for the reported data until sludge volume to the incinerator is measured and weighbridges are available throughout the year.

Line 16 NI Water has reported a quantity of sludge disposed of in the year equal to that produced in the year. The Company has only limited sludge storage and maintains disposal throughout the year. As above, we recommend a B3 confidence grade for this data.

Line 17 The estimate of additional sludge arising due to quality obligations since 2005/06 is based on the difference of two estimated quantities based on partly on assumed solids contents. Our confidence in the reported difference is low. We recommend a confidence grade of C5.

21 TABLE 16 – NON FINANCIAL MEASURES – SEWERAGE SERVICE ACTIVITIES

21.1 Key Points

Sewerage asset balance

1. Year start and year end total length of sewerage is taken from the corporate GIS. The difference does not relate to the reported movement in the year.

2. The Company has responsibility for lateral sewers and drains which are not the responsibility of water and sewerage companies in England & Wales. We understand that these public laterals and drains are not included in the reported length of sewerage. We recommend that the reporting requirements are amended to reflect this additional responsibility and that the implications comparative analysis and future funding are considered.

3. There has been a stepped increase in the proportion of critical sewer reported based on data from additional drainage area plans. We recommend that the Company considers using GIS data to reinforce its assessment of critical sewerage. NI Water has made an initial assessment based on GIS data which indicates that the length of critical sewer may increase further.

4. Changes in sewerage stock in the report year are limit to changes arising from Engineering & Procurement contracts. The reported data does not take account of changes as a result of the Operational Capital programme or sewers adopted by the Company. The allocation of sewers between critical and non-critical and between new and replacement sewers does not appear to be robust. We recommend that the Company puts in place a more comprehensive system for reporting changes to sewerage assets for future years.

Intermittent discharges

5. The Company has continued to improve its knowledge of CSO data through drainage area plans and by a review of consents for wastewater treatment works. The Company recognises that further survey and reviews is likely to result in additional intermittent discharges being identified.

6. The assessment of unsatisfactory intermittent discharges is based on formal assessments by EHS of 333 discharges (15.3% of the reported total) which identified 51% of the discharges assessed as unsatisfactory.

7. The Company has identified 1025 overflows at pumping stations but is not able to confirm whether these are emergency overflows or CSOs. This introduces additional uncertainty in the reported figures.

8. We recommend that careful consideration is given to the definition and categorisation of unsatisfactory intermittent discharges (including the definition of a CSO) for PC10 to facilitate understanding and monitoring of outputs. This categorisation should form the basis of future AIR reports.

9. We recommend that NI Water develops a definitive list of intermittent discharges which includes the facility to track additions, deletions and changes in categorisation.

Drainage Area Plans

10. Drainage Area Plans are produced to a standard specification which is typical of industry practice.

11. Drainage Area Plans inspected were found to be of reasonable quality and compliant with the Company specification.

12. There are gaps in the information readily available to undertake a DAP. For example: the Company does not have a flooding risk register; and information of collapse and blockage are not spatially mapped to identify clusters of defects. The Company addresses this weakness in data through internal consultation workshops to elicit available information at the start of each DAP.

13. The DAPs then become a key source of information of sewerage data. At present, there is no formal way of feeding this information back into centralised data systems. For examples, changes to data identified in DAPs do not necessarily result in changes to the corporate GIS data. We understand that the development of a Corporate Asset Register will address this issue. However, it will take time to these systems to be established and to develop long term data which will allow clusters of defects and trends in serviceability to be identified.

PPP Sewerage Service Activities

14. PPP concessions were not responsible for sewerage service activities in the report year.

21.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided methodology statements for these lines which were reviewed.

Our audit consisted of several meetings with the Company. During the audit meetings we:

- reviewed the data sources used by the Company in the analysis;
- gained understanding of how the data was collected;
- on a sample basis confirmed how the source data was collected;
- discussed how the Company had interpreted the lines;
- reviewed the confidence grades ascribed to the reported data by the Company;

21.3 Table 16 – Blocks A, B & C– Asset Balance

21.3.1 Commentary on the Company methodology

Total length of sewer

The Company has taken the total length of sewer from the corporate GIS.

We understand that the reported length of sewer is likely to exclude laterals and drains which are the responsibility of the Company but which are not the responsibility of water and sewerage companies in England & Wales.

Total length of critical sewer

The quantity of critical sewer has been derived from the assessments made by the Company during drainage area plans. During the report year the Company has increased the number of drainage area plans used the assess the proportion of critical sewers. As a result, the reported proportion of critical sewers has risen from 9.5% to 17.3%. Given the rapid movement in this number year on year we have limited confidence in the reported figure. We understand that NI Water will continue to update the reported figure as DAPs are undertaken.

The Company has applied the revised proportion of critical sewers to the 2006-07 closing balance of sewer length to estimate a revised opening balance of critical sewers for 2007-08.

The Company proportion of critical sewer recorded by the Company is lower the water and sewerage companies in England, Wales and Scotland. This may be due to a number of reasons:

- The Company might have underestimated the proportion of critical sewer and further work will result in a gradually increasing estimate of the length of critical sewer.
- The Company serves an area of less intense development that companies in England Wales and Scotland and, as a result has a greater length of smaller sewerage assets which are lees likely to be categorised as critical.
- The Company's GIS includes some element of the laterals and drains which are the responsibility of the Company but are not the responsibility of similar companies in England Wales and Scotland.

The fact that the length of sewer per connected property is higher for NI Water than for any water and sewerage Company in England, Wales and Scotland suggests that at least one of the latter two points is true. It is therefore likely that the true proportion of critical sewers in Northern Ireland is lower than in England Wales and Scotland.

We recommend that consideration is given to estimating critical sewers through data queries on information contained on the corporate GIS taking account of sewer type depth diameter and material. Consideration could also be given to mapping road types to sewer as a surrogate for traffic information. We recognise that his approach cannot fully address some of the data required for critical sewer categorisation. However, it can provide a reasonable approximation. We understand that NI Water has made an initial assessment based on GIS data which indicates that the length of critical sewer may still be an underestimate.

Changes to the sewerage asset balance during the Report year

The Company notes that the reported data is derived from Engineering & Procurement monthly returns.

We understand that the reported data excludes work carried out under the Operational Capital programme. We understand that the reported data excludes sewers constructed by third parties and adopted by the Company. Therefore we conclude that the Company has not provided a full report on changes during the report year. We recommend that the confidence grades of the report are down graded accordingly.

We understand that the Engineering & Procurement changes to the asset balance during the report year were determined by a request for information circulated to consultants working on individual projects. From limited sample audits carried out on information returns we concluded that the allocation of new sewers between critical, non-critical and between new and replacement was not robust. This is reflected in the Company's commentary.

Work on critical sewers has largely been concentrated within Belfast and specifically the Belfast Sewers Project. We were provided with data which substantiated the new critical sewers installed as part of the tunnelling work within the project but we could not confirm if there were additional new critical sewers outwith the tunnelling work.

We recommend that the Company puts in place a more comprehensive system for reporting changes to sewerage assets for future years. We recommend that this should include information from the Operational Capital Programme and sewers adopted by the Company. We recommend that the Company reviews the allocation of sewers between critical and non-critical and between new and replacement sewers.

Sewer collapse and blockage

Information on sewer collapse and blockage has been taken from the Company's Ellipse and Mobile Works Management databases which is used to record work and allocate individual jobs to in-house teams or contractors.

The Eclipse database was used for sewerage until 3rd December 2007. NI Water has moved to using a Tough Book data capture system with data stored on the Mobile Works Management database. There is a concern that some data is not recorded at the cross over date. We were provided with data from both systems.

The information reported is based on Standard Job Type codes which identifies the type of work in Ellipse.

The Company accepts that there will be some mis-coding of Standard Job Types on Ellipse which will give rise to uncertainty in the reported data. In addition, completion details giving the work actually carried out and actual defects identified may not be completed accurately. The Company has reported a B4 confidence grade to reflect these concerns.

The Company has noted that it will aim to reconcile work orders against invoices for future years to improve its confidence in the reported data.

The reported number of sewer collapses includes rising main bursts. The Company is not able to identify rising main bursts separately for the purposes of completing table 16A line 1.

We understand that the Company intends to establish a separate Standard Job Type to allow rising main bursts to be recorded.

We understand that work orders raised to repair damage caused by third parties is currently reported within the sewer collapse figures. We understand that NI Water will identify repair work due to damage by third parties separately to allow the work to be recharged. We recommend that this type of work is excluded from the report on sewer collapse and blockage.

We understand that some blockage clearance and collapse repair work will have occurred on private drains and laterals. We recommend that NI Water considers how this type of work can be identified and excluded from the totals.

NI Water is responsible for a range of laterals and drains which are not the responsibility of water and sewerage companies in England & Wales. Previous experience suggests that many blockages and collapses will occur on these smaller drains. This may be part of the explanation the high incidence of blockage and collapse reported by the Company relative to water and sewerage companies in England & Wales.

As a result of work on public lateral and drains:

- The Company will incur additional costs in clearing blockages and repair collapsed sewers which might not be properly reflected in econometric models used to benchmark future capital maintenance and operational budgets.
- If spatial mapping is adopted to allocate defects to sewers, defects occurring on laterals might be attributed to the main sewer resulting in a misleading assessment of the performance of the main sewer.

To address these issues, the Company will need to identify whether a collapse or blockage has occurred on one of the following:

- A private lateral or drain.
- A public lateral or drain.
- A main public sewer.

It will also be necessary for the Company to ensure that the length of sewer reported either excludes or includes the length of public lateral or drain and that the length of public lateral or drain is understood.

These issues relating to the identification of the type of sewer will affect other areas of reporting. For example, many incidents of internal and external flooding other causes will be due to blockage. The Company might be expected to have a higher incidence of flooding other causes compared to similar companies in England and Wales due to flooding caused by blockage of public laterals and drains. We recommend that the Company records whether flooding other causes was due to defects on public laterals and drains.

It is probable that some blockages and collapse will have resulted in multiple work orders on Ellipse. We recommend that the Company considers how it can adjust its methodology to allow repeat visits relating to a single incident to be identified and removed from the report.

21.4 Table 16 - Block D – Intermittent Discharges

21.4.1 Commentary on the Company's methodology

The Company's report on intermittent discharges is based on 4 sources of data:

- On-going work by EHS to determine whether intermittent discharges are unsatisfactory. Of 333 intermittent discharges subject to formal classification, 51% have been classified as unsatisfactory.
- Information derived from GIS database which identifies 799 CSOs on the sewerage system.
- Information derived from the GIS database that there are 911 overflows from pumping stations within the sewerage system.
- Information on overflows at wastewater treatment works which has been updated by a review of Water Order Consent applications for treatment works with a population of greater than 250 which gives a total number of CSOs at treatment works of 466.

We understand the summary of numbers of CSOs by location and type is as follows:

Type of overflow	Sewerage system	WwTW	Total
Formula A overflow		88	88
FFT overflow		218	218
3DWF overflow		24	24
CSO	799	22	821
Overflow at Pumping Station	911	114	1025
Total	1710	466	2176

The derivation of the reported figures from this data is described in the commentary by line below.

Some of the intermittent discharges at treatment works, particularly those highlighted as 3DWF or FFT are likely to discharge through storm tanks.

The Company has only included the 799 CSOs on the sewerage system in its reports on CSOs in line 16b and 17b. This definition excludes overflows which serve the same function but which are located at pumping stations and treatment works.

In the absence of detailed information the Company has assumed that 50% of pumping stations are foul only. On this basis it has assumed that 512 overflows (50% of 1025) at pumping stations relate to foul only pumping stations and are emergency overflows which discharge on equipment failure only. In the figures reported in Lines 16 and 17, the Company has assumed that these emergency overflows will not be unsatisfactory.

Based on our experience, we note that it is possible that emergency overflows may be deemed to be unsatisfactory in the future and improvement works included in future investment plans.

Improvement to intermittent discharges can be a key measure for delivery of an investment programme. We are concerned by the degree of uncertainty in the number of intermittent

discharges and the number of unsatisfactory intermittent discharges. From previous experience, we note that changes in the numbers of intermittent discharges and reclassification of the type of intermittent discharge can cause confusion when monitoring the delivery of an investment programme. We recommend that careful consideration is given to the definition and categorisation of unsatisfactory intermittent discharges (including the definition of a CSO) for PC10 to facilitate understanding and monitoring of outputs.

Other categories of intermittent discharge which have not been included in the return and which may be included in future investment plans include dual manholes and surface water discharges.

We understand that NI Water will continue to develop a definitive list of intermittent discharges. We recommend that this listing should include a means of tracking changes to designation of intermittent discharges over time.

21.4.2 Comments on individual lines including confidence grade

Line 16a The number of intermittent discharges excluding CSOs is reported as the total number of intermittent discharges identified above (2176) less the CSOs on the sewerage system reported in line 17b (799) less 50% of the overflows at pumping stations (512) on the basis that these spill on equipment failure only and are not deemed to be unsatisfactory.

The Company reports a C4 confidence grade based on the extrapolation of formal assessments completed to date. In view of the uncertainty on the total number of CSOs and the allocation of overflows associated with pumping stations, we recommend a confidence grade of C5.

Line 16b The number of unsatisfactory intermittent discharges CSOs (EHS) is the number of CSOs on the sewerage system reported in line 17b (799) factored by 51%, the proportion of CSOs formally assessed by EHS which have been found to be unsatisfactory.

The Company reports a C4 confidence grade based on the extrapolation of formal assessments completed to date. In view of the uncertainty on the total number of CSOs and the allocation of overflows associated with pumping stations, we recommend a confidence grade of C5.

Line 17a The number of intermittent discharges excluding CSOs is the total number of intermittent discharges (2176) less the number of CSOs on the sewerage system reported in line 17b (799).

The Company reports a B4 confidence grade. There is an acceptance that intermittent discharges will be missing from the records and will be identified as further DAP work and water quality investigations are undertaken. The reported figures are based on an allocation between CSOs and other intermittent discharges which is based partly on assumptions. We recommend a C4 confidence. However we would not be surprised if the reported figures moved by more than 25% in the future.

Line 17b The reported number of CSOs is the number of CSO identified on the sewerage system only. It is possible that some of the intermitted discharges at pumping stations and within treatment works boundaries also overflow during storms, serving the same function as CSOs on the sewerage network.

The Company reports a B4 confidence grade. For the reasons stated above we recommend a C4 confidence. However we would not be surprised if the reported figures moved by more than 25% in the future.

21.5 Table 16 - Block E – Drainage Area Plans

21.5.1 Approach to the audit

During the audit we:

- Met the Asset Performance Manager (Waste Water), and the consultant's Programme Manager to review the prioritisation, compilation, management and governance of the DAP programme, its linkages to capital and operational work programmes, together with a review of the technical approach.
- Inspected two completed plans (Newcastle DAP, and Ballyhalbert DAP).
- Reviewed supporting documentation including, the prioritisation matrix, the allocated priority scores listing agreed with the stakeholders including EHS, and the latest 'workbank' listing used to develop the capital works programme.
- Reviewed the Company's commentary and reported confidence grades.

21.5.2 Commentary on the Company's methodology

NI Water has a substantial programme of DAP work both recently completed and ongoing. The programme is focused on larger drainage catchments, those with known environmental issues, and those expected to need capital maintenance works to improve service delivery performance.

The purpose of the ongoing DAP programme is to support the current capital works programme to the end of the current 3 year SBP plan period, and to substantiate the programme of works needed for inclusion in the planning of NIAMP3.

The DAP programme is managed for NI Water by a consultant who manages the procurement of from consultants, and specialist contractors on behalf of NI Water.

All DAPs, regardless of size, are produced to a common comprehensive specification which is typical of practice across the industry. The specification is based on the need to produce a two-stage report which consists of: Stage 1 – Model Build and Verification, and Stage 2 – Options and Solutions. The specification calls on standard industry methodologies and specifications including:

- WRC Sewerage Rehabilitation Manual 3rd edition
- A Guide to Short Term Flow Surveys of Sewer Systems
- WaPUG Code of Practice for the Hydraulic Modelling of Sewer Systems
- UKWI Engineering & Operations Committee - Model Contracts

- UKWI Engineering & Operations Committee – Manual of Sewer Condition Classification

The DAPs selected for audit were found to be of reasonable quality, and compliant with the standard specification

No relaxation of the standard is currently allowed for smaller catchments, or for revised DAPs.

DAP work is bundled for cost-efficiency and unit cost (by population) is monitored.

There are gaps in base data available to the DAP programme, including:

- lack of a formalised regulatory-compliant sewer flooding register (DG5);
- lack of spatially mapped blockage, collapse and pollution incident records; and,
- definitive asset records of CSOs and SPS.

We understand that the sewer records from the corporate GIS generally include reliable records of location, diameter, and length. Other records (material, date-in-service, level) are less complete and possibly less reliable. To a greater or lesser degree, this is typical of other water and sewerage companies.

Currently, work is underway to: develop a DG5 register; develop a Corporate Asset Register (CAR); and formally record pollution incidents. The introduction of mobile work management systems should improve the availability of information on defects and repair work. However, it will take time for these processes to develop and for sufficient data to become available to deliver material improvements.

Considerable knowledge held within operational units is used to bridge these gaps. A consultation workshop is held at the start of each DAP to elicit information. Predictions of flooding, and CSO spill frequency and duration, are tested against operational knowledge to improve confidence in model output.

Each DAP includes critical sewer categorisation. CCTV work is used to assess condition and performance grades and identify defects. It may be possible to improve the focus of CCTV survey work when more reliable and spatially mapped performance records become available.

NI Water is updating DAPs over five years old, in preparation for NIAMP3. These drainage areas are predominantly the larger ones which were modelled first for the former NIWS.

DAP output is not yet used to update asset data records. We understand that this will change once the Corporate Asset Register (CAR) is developed. There is a significant backlog of data captured in the DAPs which could improve the quality of data reported in other areas of the business.

During the audit of DG5 flooding records (Table 3), we noted information abstracted from schemes generated by the DAP programme being used to populate the developing flood risk register.

21.5.3 Comments on individual line entries and confidence grade

Line 18 Supporting evidence was provided for the line entry of 49. The confidence grade of A1 is appropriate.

Line 19 Supporting evidence was provided for the line entry of 30. The confidence grade of A1 is appropriate.

Line 20 The 109 sewerage drainage areas is the total number of drainage areas larger than a resident population value of 1000.

If a drainage area is taken as the sewered area draining to an individual treatment works or discharge, the true number of drainage areas is greater than 1080. Many of the drainage areas defined in this way serve a few houses and drain to a septic tank.

For purposes of management and reporting, it may be useful to combine many of these smaller drainage areas into drainage area zones based on the larger drainage areas and reflecting local water sheds and the likely transfer point if a public septic tank was abandoned and the discharge transferred for treatment. We recommend that this approach is considered by the Company in conjunction with the Utility Regulator.

The Company reports a confidence grade of A2 for the figure reported against its definition. Given that the definition does not comply with the reporting requirements we recommend a confidence grade of D6. However, we recognise that an A2 confidence grade is a better reflection of NI Water's understanding of its DAP programme.

Line 21 This is line 18 divided by line 20.

Given that the companies report in line 20 does not comply with the reporting requirements we recommend a confidence grade of D6.

Line 22 The percent of properties/population covered by completed studies is based on population served.

The reported percentage is the estimated population served by completed DAPs divided by the population reported in table 13 line 10.

The commentary points out that this figure is sourced from population statistics used for NIAMP2 planning and dates from 2003. As this population statistic may well have changed over the intervening 5 years, a confidence grade of C4 is reasonable.

21.6 Table 16 - Block F – Other Sewerage Activities

21.6.1 Commentary on the Company's Methodology

The Company has reported sewerage service activities for sewage treatment works and pumping stations only.

The Company has based its report on expenditure exceeding the reporting threshold values in the report year.

The Company has not tested whether projects reported against the expenditure threshold of £100k also exceeded 10% of the GMEA value of the asset.

The Company has based its allocation on expenditure in 2007-08 only and has not taken account of previous expenditure by NI Water Service on projects completed in the report year.

The Company has reported against projects where total expenditure exceeded £100k in the report year. Projects reported against quality or maintenance categories might not have exceeded the £100k expenditure limit for that purpose. For example, Ballycastle Water treatment works in lines 24 and 24 (maintenance) and 26 and 27 (quality). Expenditure reported for the year was £380 k. The allocation to base maintenance is 15% (£57 k) and the allocation to quality was 24% (91k). Expenditure in neither category exceeded the reporting threshold.

The reporting requirements note that for projects which spand more than one year the Company should report activity in the report year when cumulative expenditure in the relevant project breaches the threshold. This has not been an issue in the report year which is based on expenditure by NI Water in 2007-08 only. For future years, NI Water will need to maintain a cumulative record of projects reported to ensure that duplicate reports are not submitted.

In our commentary on Tables 38, 36 and 38 we have note concerns about the allocation of costs by purpose for sewage treatment works which appears to underestimate the allocation to quality. Weaknesses in this allocation will affect allocation of treatment works to sewerage activities in Table 16.

21.6.2 Commentary on individual lines including confidence grades

Line 23 The Company reports that it did not undertake maintenance of intermittent discharges where cumulative expenditure exceeded £100k in the report year.

Lines 24 to 27 The report includes projects where total expenditure in the report year exceeded £100 k but expenditure allocated to the relevant purpose code was less than £100k. We believe that these projects should be excluded from the reported figures.

Line 28 & 29 NI Water collected data for first time sewerage for existing properties provided under Article 157 of the Water and Sewerage Services (Northern Ireland) Order 2006 from the descriptions on each of the A0 project "needs" sheets.

It is possible that the number of properties connected as a result of these schemes will differ from that identified at the project needs stage.

Lines 30 The Company reports that it did not undertake maintenance of sludge treatment works where cumulative expenditure exceeded £100k in the report year.

Line 31 The report on pumping stations includes projects where total expenditure in the report year exceeded £100 k but expenditure allocated to maintenance was less than £100k. We believe that these projects should be excluded from the reported figures.

Line 32 The Company reports that it did not undertake maintenance of sea outfalls where cumulative expenditure exceeded £100k in the report year.

22 TABLE 16A - NON FINANCIAL MEASURES – SEWERAGE SERVICE SERVICEABILITY INDICATORS

22.1 Key Points

1. At present, the Company is not able to distinguish sewage rising main failures from gravity sewer collapse. Rising main failures are included in sewer collapse.

2. In our report on Table 16 we have noted the need to distinguish collapse and blockage on the public laterals and drains which are the responsibility of NI Water to ensure that a reasonable comparison can be made with data reported for water and sewerage companies in England and Wales.

3. The Company's report on equipment failures is the number of work orders for mechanical and electrical maintenance staff to visit site. The report does not identify whether a work order was associated with an equipment failure which would resulted in or was likely to result in a service failure.

4. We note the need to develop a clear definition of the equipment failures to be reported in this table to allow appropriate and consistent reports to be generated.

22.2 Table 16A - Block A – Sewers Maintenance

22.2.1 Comment on the Company methodology

Sewer collapse and blockage

The rate of sewer collapse and sewer blockage per 1000km is reported in lines 12 and 13 of table 16. The number of sewer collapses and sewer blockages are calculated with in the tables from lines 1, 12 and 13 of Table 16. We have commented on the Company's methodology for recording sewer collapse and blockage under Table 16.

Equipment failure

The number of equipment failures reported by the Company is the number work orders placed which require mechanical and electrical maintenance team staff to attend.

The Company has based its report on information in the Automated Maintenance Management System (AMMS). This database is used by the mechanical and electrical maintenance teams to monitor requests for work and manage workload. All requests for M&E input are recorded on this system along with details of the works. The database was used for the entire report year. NI Water are currently closing this system down and replacing with the Mobile Work Management system.

The AMMS database records whether a work order relates to reactive maintenance. This is used to distinguish work in response to an equipment failure from planned maintenance. Only reactive maintenance data has been included in the reported data.

The reported data excludes maintenance work orders for sewage treatment works.

The reported data may include repeat visits to resolve a single equipment failure.

For the report year the reported data is limited to sewage pumping stations and mechanical screens at CSOs. The Company has not included the full range of equipment identified in the reporting requirements. We understand that chemical dosing equipment on the sewerage network is generally associated with pumping stations and work orders associated with chemical dosing is likely to be included in the report.

At present, the Company is not able to separate out equipment failures at terminal pumping stations which are not on treatment works.

The reported data does not include any items which have no direct mechanical or electrical maintenance staff involvement. Therefore the report excludes unscreened overflows, items such as valves, penstocks and hydrobrakes and oil interceptors.

The reported data does not reflect whether the equipment failure had, or was likely to have a detrimental impact on service to customers or to the environment. For example all pump failures are included. Most pumps operate as a duty standby set. Failure of a duty pump results in limited risk to the customer or the environment.

The Reporter is asked to comment on the advantages and disadvantages of monitoring performance of "equipment" with non-infrastructure maintenance and comment on the clarity of the definition. Our comments are as follows:

- The key advantage of monitoring equipment failure as a serviceability indicator is that equipment failure is often the root cause of a service failure. As a result, equipment failure can serve as a sub-threshold indicator for serviceability.

- A second advantage is that companies generally collect information on equipment failure in some form which means that the data is already available.

- The key disadvantage in the reported data is the lack of a clear definition of how to link equipment failure to actual or potential detrimental impact to customers or the environment. It should be possible to link an equipment failure event to its impact on service if a failure has occurred. However, the concept of near-miss reporting is difficult to establish on any consistent basis.

- The difficulty in establishing a clear interpretation of what is likely to lead to a service failure will affect the comparison of equipment failure data between companies. A review of historic trends reported by some water and sewerage companies in England & Wales shows marked differences between similar companies which must be due to different interpretations of the definitions. We would be concern about any strong conclusions which were drawn from a comparison of reported equipment failure data across the industry.

- A review of historic trends reported by some water and sewerage companies in England & Wales shows material changes in the data over time which must relate to changes in the interpretation of the definitions. We believe that there is a need for any Company to maintain consistent reporting over time both in terms of the interpretation of the definitions and the reporting systems used.

- NI Water is currently establishing the Works and Asset Management Systems which will provide the basis of future equipment failure reports. There is an opportunity to create a clear definition of what should be reported in the Annual Information Return as an equipment failure and ensure that this can be reported reliably and consistently. We recommend that NI Water and the Utility Regulator reach agreement of what should be reported as an equipment failure to meet the objectives of table 16A.

22.2.2 Comment individual line entries including confidence grade

Confidence grades are not required for Table 16A.

Line 1 The Company's data capture system does not differentiate between rising main works and gravity sewer works. Rising main failures are included within the number of gravity sewer collapses reported in line 2. We were informed this is being corrected by new data capture system introduced in June 2008

Line 2 & 3 The values include both gravity and rising main collapses and blockages because NI Water does not include a field in their database to differentiate between the two items.

We confirm the number of rising main breaks and gravity sewer collapses is equal in both Table 16A Line 2 and Table 16 Line 12.

Line 4 The reported number of failures is the number of reactive maintenance work orders recorded for the report year on the Company's AMMS system. The report is limited to work orders relating to pumping stations and CSOs .

We understand that the report for the previous year was derived from extrapolation of six months data from the same source but including work orders at sewage treatment works. Based on these changes in methodology, we are not convinced that any trend in the data is reliable.

In the absence of a clear link between work orders and the risk of service failure and the lack of data other than sewage pumping station data, we recommend a confidence grade for this data of C6.

23 TABLE 16B - NON FINANCIAL MEASURES – SEWERAGE SERVICE SERVICEABILITY INDICATORS

23.1 Key Points

1. The methodology for the prediction of performance is in accordance with that set out in the Reporting Requirements, except that 2 years data were used instead of the 3 years of data required by the reporting requirements.

2. Data on size banding rely heavily on NIAMP2 data, with limited updating. These data are aging and could not be audited.

3. The analysis is based on statutory compliance data. Compliance samples are collected and tested by NI Water and the test results shared with EHS.

4. NI Water holds comprehensive original consent data.

5. Our checks confirmed that the analysis has been correctly carried out, subject to the use of 2 years data .

6. We are not convinced that the reported data is a useful forecast of the no failures for the current year against the various parameters. The report is based on historic data and reflects performance in the past. If anything, the data us a refection of the companies ability to apply with the consents existing in the past with the assets existing in the past. It does not reflect tightening standards and any investment and improvement in operational practice to meet these standards.

23.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of one meeting with the Company. During the audit meeting we:

- reviewed the data sources used by the Company in the analysis;
- confirmed that the treatment works size bands used in the analysis were consistent with those reported in Table 15 and 17;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement expect as set out in the Company's commentary;
- reviewed the confidence grades ascribed to the reported data by the Company.

23.3 Comments on the Company's Methodology

23.3.1 Sewage Treatment Works Size Data

The Company's analysis is based on a list of 1084 treatment works of which 194 are in size bands 3 and above. The treatment works data used in the analysis is the same as that used to prepare the Company's report on Section 15. We have commented on this data under Section 15.

23.3.2 Source of Sample Data Used in Analysis

The Company undertakes sampling and testing for treated wastewater discharges. This includes:

- regulatory sampling carried out at a rate and to a schedule agreed with EHS;
- internal monitoring carried out to meet NI Water's internal requirements.

The report in Table 16B is based on regulatory sampling data only. Regulatory samples are collected by NI Water at frequencies and dates are agreed with EHS. Sampling frequency is determined by the population equivalent of the works concerned. Samples are tested in accredited NI Water laboratories and entered on the LIMS database. NI Water staff carries out self-checking and changes are recorded, although the reasons for changes are not. There is no written procedure for data entry and changes. NI Water meets EHS on a monthly basis to discuss and agree results and changes.

The sample data used in the analysis is for the calendar year, consistent with the data used for regulatory monitoring by EHS.

23.3.3 Consents and Consent Changes

Each sample result records the consent in place at the time of sampling. During the audit we verified by sample checks that consent changes (which usually take place on the 1st January each year) were recorded alongside the sample data.

Prior to the formation of NI Water many smaller works did not have formal consents. Consents are now in place for all works and NI Water was able to produce the original EHS consent documentation for all the sites requested during the audit.

In the analysis the Company has used consent data prevailing at the time each sample was taken. During the audit we were able to obtain a sample of consents which had changed during the two-year period considered in the analysis and confirm that the new consent had been properly applied at the correct time.

The analysis assumes that a defined numeric consent is available. The Company has generally taken the 95%-ile numeric consent value where available.

The Company consents include an UWWTD schedule. In respect of Table 16b, the UWWTD schedule typically includes a BOD consent of either a 25 mg/l numeric limit or 70% removal from inlet to outlet. If a sample complies with either limit the sample is deemed to be compliant. Works performance is judged against a look-up table test. Because UWWTD

compliance is not judged against a simple numeric consent, the Company has excluded the UWWTD consent limits from the analysis. For works with a UWWTD consent Table 16b has been assessed against the numeric limits of the consent excluding UWTTD conditions. In some cases where the UWWTD schedule is the only element of the consent, the Company has not included the works in the analysis.

23.3.4 Data Analysis

The data analysis for individual works follows the methodology set out by the Utility Regulator with the exception that the analysis is based on two years data (2006 and 2007) rather than three years of data, as required in the Utility Regulator's reporting requirements. The Company has adopted this approach, because the data which exist for 2005 were subject to a great many changes due to rationalisation, abandonments and the construction of PPP projects and are considered unrepresentative of performance. The analysis is amended so that

$$r_v = \frac{V_{(Y-1)} + V_{(Y)}}{2}$$

The effect of using two years data rather than 3, will be to reduce the smoothing of outlying events which may result in slightly pessimistic projections. NI Water intends to prepare the analysis on the basis of 3 years data (2006/7/8) for AIR09.

All works in size bands 3-6 were analysed for each of the three criteria (a), (b) and (c). As part of the audit, the analysis was repeated for Tullygarley, Rathfiland, Moygashel and Ballygowan WWTWs (but using 2 years data instead of 3). These sites cover a range of size bands and current performance. The checks confirmed that the analysis had been correctly carried out.

23.3.5 Comment on Individual Line Entries

Lines 1-9 Total numbers of works and numbers in size bands 3-6 differ from those in Table 17C. Table 16B is limited to works with numeric consents. Table 16B considers all works sampled in the year. In table 17C the Company has reported the number of works at year end.

The Company has included all works sampled in the year in the analysis including works which were abandoned in the year. A net figure of 40 works abandoned in the year were included in the analysis, comprising 38 abandoned as pumpaways and 2 abandoned as gravity diversions.

23.3.6 Comments on Confidence Grades

The allocated confidence grade of A2 is supported. The data are held in auditable corporate systems. The accuracy component of 2 reflects uncertainty in the original measurements.

24 TABLE 17A – SEWERAGE SUB-AREA EXPLANATORY FACTORS

24.1 Key Points

General

1. The Company concluded that the current structure of its accounting systems meant that it did not have the facility to complete Table 17A on an area by area basis. As a result, the Company has provided a report for its service area as a whole in Table 17A, Column 9 only.

2. The lack of any sub-division may impact on the ability to determine future revenue and prices for PC10. We recommend that attention is given to this allocation to ensure that a decision is made in time to complete Table 17a for AIR09. At that stage it may be possible for the Company to calculate the position for 2007-08 based on location codes or responsibility codes in current accounting system.

Sewerage sub-area data

3. Data on the sewerage area generally reconciles to other information of the return, although in some cases different confidence grades have been reported which we comment on against individual lines.

4. The area of the sewerage district is the total area of the sewerage district (the area of Northern Ireland).

5. The length of sewer reported excludes public laterals and drains. This is consistent with reported data for England & Wales. However, we understand that NI Water is also responsible for sections of lateral sewers and drains and we recommend that this additional responsibility is considered in any comparative analysis undertaken.

Financial data

6. The costs reported in Column 9 of Table 17a reconcile to the costs of "sewerage" reported in Column 2 of Table 22. We have reported on the allocation of costs between service areas under Tables 21 and 22. The allocation of costs to the sewerage service in total appears to be reasonable. We have expressed some concerns regarding the allocation of costs of labour between direct and general and support costs. We have noted that the Company has not identified terminal pumping stations to allow their costs to be allocated to sewage treatment.

24.2 Table 17A - Blocks A and C – Sewerage Sub-Areas and Sewerage Data

24.2.1 Approach to audit

Much of the Company's data is derived from other sections of the return. We reviewed the Company's data for consistency with other sections of the return and have commented by line below.

24.2.2 Commentary on individual line entries including confidence grades

Lines 1 & 2 The total population reported in Lines 1 and 2 reconcile to the population reported in Table 13 Line 10.

The Company reports a confidence grade of A3 for Line 1 and B2 for Line 2. In table 13 line 10, the Company reports a confidence grade of C4 for the total connected population. In view of the uncertainty and until NI Water has completed its Data Integrity exercise, we recommend a confidence grade of C4 for this data, consistent with Table 13.

Line 3 The volume of sewage collected reconciles to the volume reported in Table 14 Line 7. This is based on a nominal return to sewer of 95%-ile of water delivered, consistent with the figure assumed across the industry in England, Wales and Scotland. The discharge volume assumes that 87% of household properties supplied with water are connected to sewer based on an analysis of LPS data. Confidence in the number of connected sewerage properties is reasonable but the figure will remain in some doubt unless it is confirmed through domestic billing. The reported return to sewer assumes that 95% of supply pipe leakage at unmeasured properties also returns to sewer. We have reservations about this assumption but understand that it is also applied consistently in similar data reported for England, Wales and Scotland.

The Company reports a confidence grade of C3, consistent with Table 14 line 7. We believe that his is a reasonable reflection of the confidence in the underlying data used in the calculation. However, we believe that the use of standard assumptions of 95% return to sewer including supply pipe leakage means the confidence in the reported figure as an accurate reflection of water returned to sewer is C4.

Line 4 The total connected properties reconciles to the sum of figures reported in Table 13, lines 5, 8 and 9. It includes voids.

The Company reports a confidence grade of B2 for the total connected properties. In table 13, the Company reports a confidence grade of C4 for the main components contributing to this data. While we recognise the uncertainty in the number of connected sewerage properties we believe that a top down approach suggests that the accuracy of the underlying data is of the order of 10%. In view of the uncertainty and until NI Water has completed its Data Integrity exercise, we would recommend a confidence grade of C4 for this data, consistent with Table 13.

Line 5 The Company has reported the area of the sewerage district as the total area of Northern Ireland.

Line 6 The length of sewer reported reconciles to Table 16 line 14, total length of sewer at 31 March 2008.

The total length of sewer is derived from records on the Company's GIS system. We understand that it excludes lateral sewers and drains which are the responsibility of NI Water but are not the responsibility of water and sewerage companies in England & Wales. We recommend that NI Water quantifies the length of lateral sewers and drains and the cost of operating and maintaining these assets. We recommend that the NI Water's responsibility for lateral sewers and drains is recognised in any comparative efficiency analysis.

The Company reports a confidence grade of B3, consistent with Table 16 line 14. We consider this to be reasonable.

24.3 Table 17A - Block C - Costs

24.3.1 Approach to audit

Our audit of the allocation of operational costs between service areas is described in our report on Tables 21 and 22. For Table 17a, we confirmed that the costs reported in Column 9 reconciled to the totals for sewerage in Column 2 of Table 22.

24.3.2 Commentary on Company methodology

We have commented on the Company's methodology for allocation costs to the sewerage sub-service area in our report on Tables 21 and 22. We have repeated specific points relevant to this table in our commentary by line below.

24.3.3 Commentary on individual line entries including confidence grades

The Company is not required to report confidence grades for costs reported in Block C of Table 17a.

Line 7 The total direct costs reconcile to Column 2 Line 9 of Table 22.

We believe that the Company has reasonable systems in place to allocate direct costs to the sewerage service sub-area.

Line 8 Total power costs reconcile to Column 2 Line 10 of Table 22.

The Company has good systems in place which allows it to allocate power costs to individual assets and therefore to service areas.

The Company has not identified any terminal pumping stations which are not supplied by power through a supply meter on a sewage treatment works. We recommend that the Company identifies terminal pumping stations and allocates the associated costs, including power costs, to the sewage treatment service. We suggest that the Company and the Utility Regulator reviews this area of allocation to ensure that there is a common understanding of the types of pumping station identified as terminal pumping stations and the types of cost allocated.

Line 9 The Company report does not report any expenditure against service charges for the sewerage service. The Company has confirmed that it does not pay charges such as consent fees for abstraction licences, although it expects to do so in the future.

The nil return reconciles to Column 2 Line 7 of Table 22.

Line 10 The general and support expenditure reconciles to Column 2 Line 10 of Table 22.

37% of the functional expenditure on sewerage is reported as general and support expenditure. This is higher than average for water and sewerage companies in England and Wales in 2006-07, although two of these companies report a higher proportion of general and support expenditure than

NI Water. As commented on under Table 21, further improvements to the structure of the Company's accounts and cost allocation processes would allow the Company to increase allocation to direct costs.

A part of the general and support expenditure allocated to sewerage comes from a common network service activity coding. These costs were allocated in proportion to direct employment cost allocation.

Line 11 The functional expenditure is the sum of the direct and general and support expenditure in Lines 7 and 10. The total reconciles to Column 2, Line 11 of Table 22.

25 TABLE 17B – SEWAGE TREATMENT WORKS – LARGE WORKS INFORMATION DATABASE

25.1.1 Key Points

General

1. The Company has fully populated Table 17b based on detailed records of wastewater treatment works and a well structured allocation of costs from the general ledger. Further improvements could be made by:

   - Refreshing and updating treatment works load data.
   - Amendments to cost coding structures to improve the allocation of general and support costs.
   - More detailed consideration of cost allocation between service areas including the allocation of costs between sewage treatment and sludge and the identification of terminal pumping costs.

Works data

2. Data on size banding is based on NIAMP2 data, with limited updating. The data has been updated following the completion of investment at individual works. These data are aging and could not be audited.

3. NI Water holds comprehensive original consent data.

Cost data

4. The Company has not reported operating costs for Kinnegar PPP works.

5. The Company has established "location" codes in its accounts which allows direct cost incurred to be coded directly to each large treatment works and provides a robust basis for reported figures.

6. The Company has allocated general and support expenditure in proportion to operational labour coded to each works.

7. The Company has generally reported all cost of electricity supplied to a works against sewage treatment and has not separated out any electricity costs of sludge treatment. An exception to this general rule is Belfast STW where all electricity costs have been coded to the incinerator and no costs coded to sewage treatment.

8. The Company has not separated out any costs of terminal pumping which are included in the direct costs of individual treatment works.

25.2 Table 17B – Line 1 and Blocks A to C – Works Information

25.2.1 Approach to audit

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this line which was reviewed.

Our audit consisted of one meeting with the Company. During the audit meeting we:

- reviewed the data sources used by the Company in the analysis;
- confirmed that the treatment works size bands used in the analysis were consistent with those reported in Table 15 and 16;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement as set out in the Company's commentary;
- reviewed the confidence grades ascribed to the reported data by the Company.

Our audit was limited to a data review and no site visits were carried out to confirm the type of works.

25.2.2 Commentary on Company methodology

The Company maintains an assessment of sewage treatment works loads which it has used to provide the total load reported in Table 15 and to report individual and grouped treatment works loads in Tables 17b and 17d. We have commented on this data for table 15. Key points arising are:

1. The treatment works loads for these works rely heavily on NIAMP2 data which was compiled in 2001-2.
2. In part, the data was reviewed and updated in 2004 to take account of new information arising from project appraisals, the effect of significant new developments including on-site house-counts, and changes in trade effluents.
3. In some cases the reported load is based on consented trade effluent as opposed to measured trade effluent discharged to the sewerage system.
4. The Company is not able to demonstrate whether the reported data includes private septic tank loads which are received as part of the Company's unregulated activities.
5. The estimate loads do not take account of any measurements made of works influent strength or flow.

The Company recognises the mixed provenance of these data and the fact that they are aging and becoming less reliable. Work being carried out on behalf of NI Water to construct a growth model is reviewing catchment boundaries, beginning with the most critical works.

The treatment works consent standard is recorded in works data sheets used as the source data for this report. NI Water was able to produce original EHS correspondence confirming consents. Sample checks confirmed that consent parameters had been correctly transferred to the spreadsheet.

The reporting requirements asks the Company to report works where one relatively tight consent parameters requires the Company to achieve performance for other parameters in excess of the consent conditions. The Company reports that Bullays Hill, Cookstown, Dunmurry, Moygashel and Newtownbreda WwTWs have consents with ammonia standards whose achievement leads to a lower effluent BOD than is consented. We understand that this

is based on performance of the current works rather than an assessment of the impact of particularly onerous consent conditions.

25.2.3 Commentary on individual line entries including confidence grades

Line 1 Data for each works are held in a single spreadsheet, recorded against the name of that works. The works reported are those with a population equivalent greater than 25,000 at year end.

Line 2 The methodology adopted to develop individual works load estimates is described above.

The Company has reported a confidence grade of C3 for individual works loads. In view of the age of the data and uncertainty regarding trade effluent and septic tank loads, we recommend a confidence grade of C4 for individual works loads pending the outcome of the review being undertaken by NI Water.

Line 3 to 7 The Company has demonstrated that the consent data reported can be reference back to correspondence with EHS.

The Company has reported the most onerous numeric consent limit for each parameter (excluding upper tier limits). Some of the reported values relate to the Urban Wastewater Treatment Directive which also allows compliance to be achieved on the basis of percentage removal as well.

The Company reports an A1 confidence grade for consent parameters. We believe that this is reasonable.

Line 8 The treatment works classifications have been taken from the Company's treatment works data sheets.

The allocation of load by classification of treatment works reconciles to Table 17d line 6 with minor exceptions. Data in Table 17b is taken from treatment works loads agreed with EHS for regulatory sampling in Nov 2006 while loads reported in Table 15 and 16B are the treatment works loads agreed with EHS for regulatory sampling in Nov 2007.

25.3 Table 17B – Block D - Costs

25.3.1 Approach to audit

Our audit of the allocation of the allocation of operational costs between service areas is described in our report on Tables 21 and 22.

For Table 17b, we confirmed costs of individual treatment works against the Company's general ledger. We inspected individual transactions for selected types of expenditure

25.3.2 Commentary on Company methodology

We have commented on the Company's methodology for allocation costs to the sewerage sub-service area in our report on Tables 21 and 22.

In addition to the coding by expense type and service activity used to allocate costs in Table 22, the Company uses a "Location Code" to identify cost against individual works for Table 17B and 17F.

The Company has separate location codes for all treatment works in size bands 6, allowing it to report costs for all works in Table 17B.

We have commented on the allocation of costs between individual table lines under the commentary by lines below.

25.3.3 Commentary on individual line entries including confidence grades

The Company is not required to report confidence grades for costs reported in Block C of Table 17b.

Line 9 The direct costs for individual treatment works were identified for the same expense types and service activity codes used to allocate costs for Table 22.

The cost coding system includes a location code. Each large treatment works reported in Table 17B has a separate location code, allowing a complete return of costs to be made.

Inspection of the accounts suggests that there may be a tendency to code labour costs to the larger cost centres and not fully allocate costs across group cost centres for smaller works. We recommend that the Company continues to review the allocation of costs

Line 10 The Company receives power bills against individual site meters which it can allocate to individual assets.

The Company has generally reported all power costs incurred at large sewage treatment works against sewage treatment. In general, no allocation has been made to sludge treatment. We recommend that the Company establishes procedures to allow this allocation to be made for future returns.

The exception to this general rule is Belfast STW (Duncrue Street) where all power taken through the site meter has been allocated to sludge treatment. As a result, the power costs allocated to the largest activated sludge process in Northern Ireland is limited to minor fuel costs.

Line 11 The Company report does not report any expenditure against service charges for the sewerage service. The Company has confirmed that it does not pay charges such as consent fees for abstraction licences but expects to do so in the future.

Line 12 The general and support expenditure allocated to sewage treatment in Table 22 Column 2 Line 10 has been distributed across sewage treatment works in proportion to the industrial employment costs allocated to each works.

In principle, we believe that this approach to distributing general and support costs between assets is a reasonable one. However we have concerns about the rigour of labour cost allocation and the extent and type of costs which may be distributed with general and support costs. Addressing these issues

would increase our confidence in the allocation of general and support costs to individual works.

Line 13 Functional expenditure is the sum of lines 9 and 12 above, calculated within the table.

Line 14 The Company has not identified the costs of terminal pumping stations.

Costs of terminal pumping incurred within treatment works "location" as defined for the purpose of coding accounts will be included in the direct costs. We understand that this is limited to the costs of terminal pumping located either within or adjacent to the treatment works.

We recommend that the Company establishes procedures to allow costs of terminal pumping coded to the treatment works "location" to be identified and reported in future returns.

We note that the Company has not allocated costs of terminal pumping at final pumping stations remote from the treatment works to sewage treatment. We recommend that the Company establishes procedures for completing this allocation in future returns, allocating the relevant costs to sewage treatment and identifying the costs in line 14 of Table 17b as appropriate.

Line 15 The Company reports no estimated sludge costs included in the costs of sewage treatment reported in Table 17b.

The Company maintains separate service activities for sludge treatment which allows costs to be coded at source. Inspection of the account indicates that costs of maintenance and chemicals for sludge treatment have been coded robustly.

As noted under line 10 above, the Company has not allocated the costs of power through a treatment works site meter between sewage treatment and sludge. Some part of the power costs in line 10 relates to sludge treatment at some works.

26 TABLE 17C – SEWAGE TREATMENT WORKS NUMBERS

26.1 Key Points

1. The Company has fully populated table 17c based on detailed records of wastewater treatment works. Further improvements could be made by:

    i. Refreshing and updating treatment works load data.

    ii. Reviewing the treatment works list to confirm that no works has been duplicated.

2. Data on size banding is based on NIAMP2 data, with limited updating. These data are aging and could not be audited. The dataset has been updated following the completion of investment.

3. We are not certain that the Company has unique references for all works and there may be some double counting of works within the data set used to populate the table.

4. NI Water holds comprehensive original consent data for current consents.

5. One works reported in the large treatment works category (Larne) became a large works during the report year as a result of the transfer of another works.

26.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of one meeting with the Company. During the audit meeting we:

- reviewed the data sources used by the Company in the analysis;
- confirmed that the treatment works size bands used in the analysis were consistent with those reported in Tables 16B, 17B and 17D;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement as set out in the Company's commentary;

26.3 Comments on Methodology, Line Entries and Confidence Grades

The Company maintains an assessment of sewage treatment works loads which it has used to provide the total load reported in Table 15 and to report individual and grouped treatment works loads in Tables 17b and 17d. We have comment on this data in under tables 15 and key points are summarised under Table 17b.

The Company is not required to report confidence grades for the data in table 17C

26.3.1 Numbers of Works and Size Bands

Data for each works are held in a single spreadsheet, recorded against the name of that works. Many works were observed to have more than one name (for example the name of the town served and the location of the works itself). Among the total population of 1084 works of all sizes for which NI Water is responsible, there may be potential for double counting of numbers.

The allocation of works to size bands depends on the assessment of population equivalent. The assessment of population equivalent is covered under table 15 above.

26.3.2 Allocation to Size Bands

The size bands for WWTWs are defined as follows in the Reporting Requirements:

Small works

size band 1	<= 15kg BOD_5/day	(population equivalent: 0 - 250)
size band 2	>15 but <= 30kg BOD_5/day	(population equivalent: 250 - 500)
size band 3	>30 but <= 120kg BOD_5/day	(population equivalent: 500 – 2,000)
size band 4	>120 but <= 600kg BOD_5/day	(population equivalent: 2,000 –10,000)
size band 5	>600 but <= 1500kg BOD_5/day	(population equivalent: 10,000 – 25,000)

Large works

size band 6 > 1500kg BOD_5/day.

Sample checks showed that numbers of works reported in the table against particular size bands and treatment categories could be reconciled with the base data.

An analysis of the average works loads for each treatment category and size band also indicates that the works have been allocated correctly.

The numbers reported for large works in Line 6 is consistent with the detailed report on large works in table 17B.

26.3.3 Treatment Category

Data held for each works records the works type. Treatment type was established for works with p.e. over 250 during the preparation of NIAMP2. A guidance document was prepared by NI Water and used during site surveys of each works to determine and record works type. This exercise was later carried out for works with p.e under 250 using the same method. Changes and closures are notified by Engineering and Procurement following capital projects.

No site visits were made to verify the correctness of treatment category

26.3.4 Small Works With Ammonia Consents

The base data for works records the consent details and conditions. Sample audit checks on the original EHS consent documents for a number of works showed that these had been correctly recorded in the works data spreadsheet. Lines 8 and 9 in the table are defined by

sorting the data on spreadsheet. The numbers of works with ammonia consents in lines 8 and 9 were reconciled with the base data.

Sample checks showed that numbers of works reported in the table against particular size bands and treatment categories could be reconciled with the base data.

26.3.5 Significant Changes

The Company's commentary highlights a number of significant changes due to pumped and gravity diversions in conjunction with works closures, as well as new works coming on stream, including PPP works. This trend will continue in the coming year.

The Company's treatment works data records when a works is abandoned. Virtually all abandonment occurs when a works is closed and flows are pumped away to another works. A consent change is then required, from a continuous treated flow to an emergency overflow. The revised consent application is picked up and used as the basis for a change in the base data, which records when a site becomes a pumpaway and also where the flows are diverted to. The number of abandonments in the report year was reconciled with the number of pumpaway and gravity diversions.

27 TABLE 17D – SEWAGE TREATMENT WORKS LOADS

27.1 Key Points

1. The Company has populated table 17d based on detailed records of wastewater treatment works. Further improvements could be made by:

    i. Refreshing and updating treatment works load data.

    ii. Reviewing the treatment works list to confirm that no works has been duplicated.

2. We have commented on the Company's treatment works data under tables 15, 17b and 17c. The Company has distributed treatment works loads in line with the numbers of works in Table 17C.

3. Sample checks on data transfer and the analysis of average loads by size band confirmed the Company has allocated work correctly.

4. We have commented in underlying weakness in the works load data which the Company is seeking to address. Until this work is complete, we recommend a confidence grade of C4 for the data reported in table 17d.

28 TABLE 17F – SEWAGE TREATMENT WORKS COSTS

28.1 Key Points

1. The Company has populated Table 17f based on detailed records of wastewater treatment works and a well structured allocation of costs from the general ledger. Further improvements could be made by:

    - Refreshing and updating treatment works load data.
    - Developing its cost allocation systems to allow it to allocate costs across treatment works in size bands 1 to 4.
    - Minor amendments to cost coding structures to improve the allocation of general and support costs.

    i. More detailed consideration cost allocation between service areas including the allocation of costs between sewage treatment and sludge and the identification of terminal pumping costs.

2. The Company has not been able to allocate direct costs of works in size bands 1-4 by size and type of treatment. The Company has reported the total direct costs for these works only in Column 11 Line 1 and has only completed Column 11 for Lines 7 to 13.

3. The Company has established "location" codes in its accounts which allows direct cost incurred to be coded directly to each treatment works in size bands 5 and 6. For smaller works the Company uses group location codes based on geographic areas and is not able to identify the costs of individual works.

4. The Company has allocated general and support expenditure in proportion to operational labour coded to each works.

5. The Company has generally reported all electricity costs to a works to sewage treatment and has not separated out any electricity costs of sludge treatment. An exception to this general rule if Belfast STW where all electricity costs have been coded to the incinerator and no costs coded to sewage treatment.

6. The Company has not separated out any costs of terminal pumping which are included in the direct costs of individual treatment works.

28.2 Table 17F – All Data

28.2.1 Approach to audit

Our audit of the allocation of the allocation of operational costs between service areas is described in our report on Tables 21 and 22.

For Table 17g, we confirmed costs of individual treatment works against the Company's general ledger. We inspected individual transactions for selected types of expenditure. We confirmed that the allocation of costs was in line with the allocation of works by size and type in Table 17D.

28.2.2 Commentary on Company methodology

We have commented on the Company's methodology for allocation costs to the sewerage sub-service area in our report on Tables 21 and 22.

In addition to the coding by expense type and service activity used to allocate costs in Table 22, the Company uses a "Location Code" to identify cost against individual works for Table 17B and 17F.

The Company has separate location codes for all treatment works in size bands 5 and 6, allowing it to report costs for lines 5 and 6 in Table 17f.

The Company codes costs of works in size bands 1 to 4 to "location" codes for geographic groups which cover a range of types and sizes of works. The Company has not distributed these costs between the type and size of works to complete lines 1 to 4 of Table 17f. As a result, the Company has reported the total direct costs of all treatment works in size bands 1 to 4 in Column 11, Line 1 of Table 17F.

We recommend that the Company establishes procedures to allow it to distribute the direct costs of treatment works in size bands 1 to 4 by size and type of treatment to allow it to complete Table 17f for future returns. This would require the Company to either:

- Establish cost centres for individual treatment works, allowing costs to be coded directly.
- Group works by size band and type of treatment to allow group "location" codes to be used to allocate costs to Table 17f.
- Establish a robust procedure for allocating costs of geographic "location" codes across the size of works and type of treatment of works covered by the location code.

We have commented on the allocation of costs between individual table lines under the commentary by lines below.

28.2.3 Commentary on individual line entries including confidence grades

The Company is not required to report confidence grades for costs reported in Block C of Table 17b.

Lines 1 to 4	The Company has not been able to allocate direct costs of works in size bands 1 to 4. The total direct costs of these works is included in Column 1, line 1.
Line 5 and 6	The Company has individual location codes for each treatment works in size band 5 and 6 and is able to identify the direct costs coded to each works. These costs have been allocated to the treatment types identified in Table 17d. The direct costs of sewage treatment works in size band 6 reconciles to the individual costs of large treatment works reported in Table 17b line 9.
Line 7 to 9	The total direct costs of sewage treatment works has been reported as a total only.

The total direct costs reconciles to Table 22, Column 2, Line 2.

The Company has not reported any sludge treatment and disposal adjustments. The Company maintains separate service activity codes for sludge treatment and disposal which allows costs to be coded at source. However, we believe that further attention should be given to the allocation of power costs (see below).

Line 10 The Company reports total power costs for sewage treatment only in Column 11. The total cost reported reconciles to Table 22, Column 2, Line 2.

The Company generally reports electrical energy billed through a sewage treatment site meter to sewage treatment only. In some cases, part of this power bill should be coded to sludge treatment. The exception is Belfast STW where the total site electricity bill has been allocated to sludge treatment and part of that cost should be allocated to sewage treatment.

Line 11 The Company does not report any expenditure against service charges for the sewerage service. The Company has confirmed that it does not pay charges such as consent fees for abstraction licences but that it expects to do so in the future.

Similar water and sewerage companies in England & Wales pay for the environmental quality regulator through fees for discharge consents and service fees. We recommend that the Company addresses the fact that it does not pay these fees as a special factor when considering future business plan submissions to the Utility Regulator.

Line 12 The Company reports total general and support expenditure only in Column 11. The total cost reported reconciles to Table 22, Column 2, Line 10.

Line 13 Functional expenditure is the sum of lines 9 and 12 above, calculated within the table. Again, only the total expenditure has been reported in Column 11.

29 TABLE 17G – SLUDGE TREATMENT AND DISPOSAL INFORMATION

29.1 Key Points

General

1. The Company has populated Table 17f based on detailed records of sludge quantities and disposal outlets and a well structured allocation of costs from the general ledger. Further improvements to the data could be made by:

   i. The introduction of the new sludge management systems being introduced by the Company which will improve the assessment and tracking of sludge quantities.

   ii. Amendments of cost coding structures to improve the allocation of general and support costs.

   iii. More detailed consideration of the allocation of costs between service areas, in particular the allocation of costs incurred at treatment works between sludge treatment and sewage treatment.

   iv. Considering the allocation of sludge transport costs to ensure these can be aligned to sludge outlets.

Sludge quantities

2. The Company has allocated the resident population served in proportion to sludge quantity. The total resident population distributed in this way is the resident population connected to the water service. We recommend that this should be revised to the population connected to the sewerage service.

3. The Company includes the disposal of sludge arising from private septic tank emptying in the reported quantity.

4. The reported quantity of sludge excludes grit and screenings which may be included in similar reports in England and Wales. Omitting these quantities from the report will affect any comparative analysis based on the data.

5. We have described the Company's methodology for assessing sludge quantities under table 15. The Company has reasonable systems in place based on manual records. The Company is implementing a system of automatic data logging and sludge management which should provided improved data.

Financial data

6. The costs reported in 17f reconcile to the costs of sludge treatment and disposal reported in Column 3 of Table 22. We have reported on the allocation of costs between service areas under Tables 21 and 22. We have expressed some concerns regarding the allocation of costs of labour between direct and general and support costs and the allocation of treatment works costs between sewage treatment and sludge treatment.

29.2 Table 17G - Lines 1 to 2 – Quantities

29.2.1 Approach to audit

Our audit of sludge quantities is described in more detail under Table 15. We met with Company staff responsible for collating and managing sludge information. We received and reviewed information on sludge quality. We visited one works to follow audit trails to the detailed records kept of sludge disposal include sludge mass, sludge solids content and outlets.

29.2.2 Commentary on Company methodology

We have commented on the Company's methodology for collecting information on sludge quantities and disposal outlets under table 15. Much of the sludge mass reported by the Company is based on specific measurements which are collated by Area Sludge Officers who report quantities monthly. However, in part, sludge quantities are based on typical quantities or vehicle movement counts which reduces our overall confidence in the data.

We understand that NI Water is implementing a new sludge management system which will improve the measurement and tracking of sludge quantities. This system should have the dual benefit of improving the management and financial control of the sludge function and improving reported data.

The Company reports sludge disposal to:

Farmland conventional	Conventionally digested sludge from Newtonbreda STW
Incineration	Sludge from the greater Belfast and surrounding areas at the Duncrue Street incinerator.
Landfill	Limited disposal of sludge to landfill to clear backlogs in stockpiles and deal with short term operational issues.
Other	Sludge disposal to forestry under waste management licence exemptions.

It is expected that the Omega PPP concession will undertake almost all sewage sludge disposal in Northern Ireland once the new incinerator in Belfast comes on stream.

We understand that the waste management licence exemption covering sludge recycling to forestry might be withdrawn before the new incinerator comes on stream. Sourcing practical alternative outlets in the short term may prove difficult and result in additional cost to the Company.

29.2.3 Commentary on individual line entries including confidence grades

Line 1 The total resident population served is the total resident population connected to the water supply in Northern Ireland. We recommend that the Company revises the reported figures to reflect the population connected to the sewerage system

The Company noted that many properties not connected to the sewerage system are served by septic tanks which are emptied by the Company. The resulting waste is treated by the Company and contributes to the sludge quantity reported. The Company reports private septic tank activities as an

unregulated business. We understand that the costs of private septic tank emptying allocated to the unregulated business are limited to the cost of waste collection. The quantity of sludge and the cost of treatment and disposal of sludge arising from private septic tank emptying are included in the Table 17f.

The population served has been allocated between outlets in proportion to the quantity of sludge in Line 1. No specific assessment has been made of the population served by individual treatment works and disposal outlets they contribute which would provide a more detailed allocation of resident population.

The Company reports an A3 confidence grade for the total resident population served and either a B2 or B3 confidence grade for the resident population served by individual outlets. The confidence grade for the total population connected to the sewerage system as reported in Table 13 is C4. We believe that this is a reasonable pending further work on connected properties and populations. We recommend that the same confidence grade should be applied to Table 17g Line1.

Line 2 The total quantity of sludge disposed of is the quantity of raw sludge produced, with the exception of sludge disposed of to agriculture which is the quantity of sludge post digestion.

The total sludge quantity is consistent with the total quantity of sludge disposed of reported in Table 15, Line 16. It includes the quantity of sludge disposed of from Kinnegar PPP.

The reporting requirements require the reported sludge quantity to include grit and screenings. However, the reported quantity of sludge excludes grit and screenings which may be included in similar reports in England and Wales. Omitting these quantities from the report will affect any comparative analysis based on the data.

The Company has reported a confidence grade of B2 for the total sludge quantity. We note that the sludge quantity is based partly on typical values and vehicle movements. We recommend that a confidence grade of B3 should be applied pending confirmation of all major sludge quantities by direct measurement.

29.3 Table 17G - Lines 3-9 – Costs

29.3.1 Approach to audit

Our audit of the allocation of the allocation of operational costs between service areas is described in our report on Tables 21 and 22.

For Table 17g, we confirmed costs of individual treatment works against the Company's general ledger. We inspected individual transactions for selected types of expenditure. We confirmed that the allocation of costs was in line with the allocation of works by size and type in Table 17D.

29.3.2 Commentary on Company methodology

The Company identified direct sludge costs from the general ledger against eleven service activities. These service activities were allocated as follows:

Activity	Description	Allocated to
620	Sludge Treatment - Tankering Between Works	Other – sludge disposal
621	Sludge Treatment	Other – sludge treatment
630	Sludge Disposal to Agricultural Land Transportation	Agricultural Conventional – sludge disposal
631	Sludge Disposal to Agricultural Land Spreading/Injection	Agricultural Conventional – sludge disposal
632	Sludge Cake Transportation to Landfill	Landfill – sludge disposal
633	Sludge Cake Disposal to Landfill	Landfill – sludge disposal
635	Sludge Logger Maintenance (Contract)	Other sludge disposal
636	Incinerator Sludge Treatment	Incineration – sludge treatment
637	Sludge Disposal Tankering from Strategic Collection Centres to Dewatering Centres	Incineration – sludge disposal
638	Sludge Cake Disposal to Incinerator	Incineration – sludge disposal
639	Incinerator Ash Disposal to Landfill	Incineration – sludge disposal

29.3.3 Commentary on individual line entries including confidence grades

The Company is not required to report confidence grades for the cost information in table 17g.

Line 3 The Company has identified treatment costs through the "activity" codes described above.

Treatment costs allocated to incineration are the costs of operation at the Duncrue Street Incinerator which can be identified separately on the Company's accounting ledger through a specific location code.

While the Company codes treatment costs to other locations, it did not undertake an analysis to allocate these location costs to the disposal outlets they contribute to. All treatment costs, other that the incinerator costs, are allocated to "Other" sludge disposal outlets, mainly the recycling of sludge to forestry.

Inspection of the accounting ledgers shows that treatment costs are mainly labour, chemicals and operational maintenance. Electrical power costs are included in treatment costs for the Duncrue Street Incinerator but not in other treatment costs (see comments on Line 6 below).

Line 4 Sludge disposal costs are allocated by the activity coding described above.

Inspection of the accounting ledgers showed that disposal costs are mainly the contractors' costs for the haulage and disposal of sludge from the main treatment and dewatering centres to the sludge disposal outlets.

In the case of the "Incineration" outlet, disposal costs include haulage of sludge cake to the Duncrue Street Incinerator and the disposal of ash from the incinerator (including landfill tax).

Treatment costs reported for "Other" sludge outlets include all inter-site sludge transport with the exception of haulage of sludge cake to the Duncrue Street Incinerator which is included in disposal costs (see commentary on Line 4). The Company has not attempted to allocate inter-site tankering between disposal routes based on the collection of sludge to treatment or dewatering centres and subsequent movement of sludge to disposal outlets.

Line 5 Line 5 is the sum of lines 3 and 4, calculated within the table.

Line 6 In all cases, sludge treatment is carried out at wastewater treatment works served by a common electricity meter. The Company has not allocated the costs of power between wastewater treatment and sludge disposal.

In most cases, all power costs are allocated to the wastewater treatment and none to sludge treatment. The exception is the Duncrue Street Incinerator where the whole power bill for the site, including wastewater pumping and wastewater treatment has been allocated to sludge treatment. We expect a significant proportion of this power costs to relate to wastewater pumping and treatment.

Line 7 The Company has confirmed that EHS or NIEA does not make any charges in respect of the management of sludge disposal.

Line 8 The total general and support expenditure in Table 17G has been taken from Table 22, Line 10, Column 3.

The Company has allocated general and support expenditure between outlets in proportion to the cost of internal employment costs included in the direct costs in Table 17G.

Because the sludge disposal costs for farmland conventional and landfill are limited to contractor costs for disposal they do not include any internal employment costs and no general and support expenditure is allocated.

We believe that internal employment cost coding to the incinerator is likely to be more robust than cost coding to other sludge treatment activities. We also note that the operation of a single fixed centre like the incinerator may require less management in proportion to employment costs than or more dispersed sludge activities. Therefore, it is possible that a more detailed assessment of general and support costs would result in more cost being allocated to "Other".

30 TABLES 21 AND 22 – ACTIVITY COSTING ANALYSIS – WATER SERVICE AND SEWERAGE SERVICE

30.1 Key Points

1. This report covers Tables 21 and 22. In our commentary by line, the line references refer to Table 21. In table 22, the line numbers are off-set by one after line 7.

2. The data has provided a reasonable allocation of costs for the purposes of Table 21 and 22 subject to issues identified below

3. Work undertaken to allocate costs in the report year is a significant improvement on the previous year. The Company has fully populated Tables 21 and 22 based on a well structured allocation of costs from the general ledger. The reported data is an improvement on the information reported by Northern Ireland Water Service in the 2006-07 information return. Further improvements to the data could be made by:

    i. Minor amendments to cost coding structures to improve the allocation of costs between direct and general and support categories.

    ii. More detailed consideration of the allocation of costs between service areas, in particular where costs incurred at an asset relates to more than one service area.

    iii. A more granular analysis of general and support costs to distribute costs at a more detailed level using more relevant cost drivers.

4. The Company has reported costs of regulated activities. The report excludes private septic tank emptying and vehicle maintenance for Roads Service. Rechargeable works are included as 3rd party services.

5. The allocation of operating costs to tables 21 and 22 is based on costs abstracted from the general ledger by service activity and expense type. Data is also abstracted for "business activities" based on areas of responsibilities.

6. In some cases the allocation of costs within the accounts does not allow for a complete allocation of costs between sub-service areas. For example costs of power at wastewater treatment works is allocated to either sewage treatment or sludge treatment and not split between the two service areas. Costs of potable water pumping at water treatment works is allocated to water resource and treatment rather than water distribution.

7. The Company has not identified terminal pumping stations remote from treatment works to allocate the costs to sewage treatment.

8. The method of cost allocation leaves a residual of direct costs including vehicle costs in service activities which do not align with sub-service areas. These costs have been allocated to general and support costs. Limited changes to the cost coding structure would allow these costs to be allocated to direct costs.

9. General and support expenditure is allocated at a relatively high level. A more detailed assessment of individual types of cost using relevant cost drivers would improve the allocation of general and support costs.

10. Reported business activity costs are direct costs. No allocation has been made of general and support costs or rates to these cost categories.

11. The reported third party services costs are rechargeable works which have been assumed to relate to the water service only. No general and support costs, rates, doubtful debts or depreciation has been allocated to third party services.

12. The OPEX element of PPP Unitary charge has been reported. The Company has explained the CAPEX OPEX split of PPP payments. For the future, we recommend that the Company identifies costs incurred by the Company associated with the provision of PPP services to ensure that the allocation of costs matches the relevant explanatory factors.

13. The Company has not completed the report tables on PPP operating costs as required by the Utility Regulator.

14. The reported costs of planned and reactive non-infrastructure maintenance includes the operating costs of water and wastewater pumping stations (including power costs) and is not limited to maintenance costs.

15. The allocation of capital maintenance charges reconciles to the relevant sections of Tables 33.

30.2 Approach to the Audit

During our audit we:

- Met with Company staff responsible for the allocation of costs to table 21 and 22. We and reviewed the methodology adopted to abstract costs from the general ledger as a matrix of "service activities" and "expense types" and the methodology adopted to allocate these grouped costs over tables 21 and 22.

- We met with management accountants responsible of each of the main service areas to understand the processes used to account for costs in each service area.

- We reviewed the accounts at individual transaction level to confirm that the source coding of costs underpinning the allocation of costs to Tables 21 and 22 was reasonable.

- We met with Company staff and worked through an example allocation of labour costs and vehicle costs to understand the ability of the Company to allocate these costs between direct cost categories and general and support costs.

- We met with Company staff responsible for the allocation of power costs to understand the Company's ability to robustly allocate power costs between service areas by allocating costs to individual assets.

30.3 General OPEX Reconciliation

Reconciliation with the annual report and accounts

The total OPEX reported by the Company in Tables 21 and 22 is:

Table 21 Line 22	Total operating expenditure - Water Service	95,354.2
Table 22 Line 21	Total operating expenditure - Sewerage Service	88,394.2
Total		183,748.5

We understand that this reconciles to the annual report and account as follows:

Reference	Description	Value (£m)
	Total operating expenses	290,627.9
	Capital adjustment	(0.4)
	Adjusted operating expenses	290,627.5
	Less	
	Profit on disposal	30.8
	Depreciation & amortisation	47,683.6
	Interest, Dividend & Deferred Tax	56,796.7
	Unregulated Costs	2,368.0
	Total	106,879.0
	Adjusted Opex	183,748.5

Comparison with the Strategic Business Plan

The Strategic Business Plan 2007-14 include estimated OPEX for 2007-08 of £190.120 million and 2006/07 prices. An additional allowance of £1.912 million was assumed for PPP operating expenditure.

We understand that the SBP allowance stated above included third party expenditure and the non-regulated business lines described below.

The comparison with the SB is therefore as follows:

Description	Value (£m)
Table 21 & 22 OPEX excluding PPP	180,876.5
Total PPP unitary charge	2,872.0
Non regulated business	2,368.0
Total	186,116.5

Total expenditure for the regulated and non-regulated business is 3.1% less than envisaged in the Strategic Business Plan.

30.4 Allocation to non-regulated business

The following costs have been allocated to non-regulated business:

Description	Cost £ m	Service Activities
Private septic tank desludging	1.775	640
Maintenance of Roads Service vehicles	1.068	820&890
Total	2.843	

Private septic tank emptying

The Company provides a private septic tank emptying service to householders and businesses not connected to the public sewerage system.

We understand that the costs allocated to this service area are the costs of staff and vehicles directly involved in providing the service. No allowance has been made for other costs such as:

- Customer services relating to septic tank empting requests.
- The cost of treating the waste received at treatment works and disposing of the sludge arising.
- Rates on the assets used.
- Depreciation on the assets used.
- General and support costs associated with the provision of the service.

We recommend that the Company reviews other costs associated with the private septic tank emptying service to ensure that the complete cost of the service is established and allow cost reflective tariffs to be determined.

Maintenance of Roads Service Vehicles

We understand that before the creation of NI Water, vehicle maintenance across government service was shared between the various services with Northern Ireland Water Service undertaking vehicle maintenance on behalf of the Roads Service. NI Water has continued to provide this service at depots it retained.

We understand that the costs allocated to this service are the direct costs of labour and materials. No allowance has been made for other costs such as:

- The maintenance of the depots used to deliver the service.
- Rates on the depots used to deliver the service.
- Depreciation on the assets used.
- General and support costs associated with the provision of the service.

We recommend that the Company assess these costs to establish the full costs of the service provided. We understand that the Roads Service will take maintenance of it vehicles back in-house from 2009-10.

30.5 Commentary on the Company's methodology for allocating OPEX

The following report on OPEX allocation covers the general principles of OPEX allocation for Tables 21, 22 and 17. Where necessary, more detailed commentary is included against individual line entries.

30.5.1 Cost coding structures

The allocation of costs is based on the allocation of summary cost information abstracted from the Company's general ledger. Therefore the quality of allocation of costs in tables 21 and 22 is determined by the structure of the coding system in the general ledger and the robustness and control of cost coding as costs are entered on the general ledger.

The coding of costs on the general ledger is based on five code types:

1. **Service Activity Code**. The service activity code determines the type of work being carried out. It distinguishes between the water and sewerage service activities. Within the water service it distinguishes between distribution and water treatment and resource. Within the wastewater service it distinguishes between sewerage, sewage treatment and sludge treatment. Further division of the service activity code within these sub-service areas allows the Company to identify costs of particular activities. Particular Service Activity codes are used to capture costs of management, administration and support functions.

2. **Responsibility Code**. The responsibility code identifies the manager with management and budget responsibility for a team of staff or group of assets. Particular responsibility codes were used to identify the costs of "business activities".

3. **Location Code**. This generally identifies the asset on which the expenditure has been made. For water treatment there are separate location codes for almost all water treatment works with the exception of some borehole groups. Water resources are generally allocated the same location code as the treatment works it supplies. All sewage treatment works in size band 6 and size band 5 have and some other works have individual location codes. Most works in size band 4 and below are included in group location codes. These group codes cover geographic areas dictated by operational practice and include a mix of size of works and treatment type. The network areas are covered by 25 location codes over Northern Ireland. The same location codes are used for water and sewerage networks. Each depot and office has a separate location code.

4. **Expense Account**. This identifies they type of expenditure such as wages, power, hire and contracted services etc. The expense accounts roll-up into common groupings such as salaries, industrial wages, power, etc known as "Expense Groups". The expense groups underlie the mapping of costs to the various lines in Tables 21 and 22, particularly the direct cost lines.

5. **Project Code**. We understand that project codes are only used for expenditure on capital projects within operational budgets. The project code identifies the capital project. It has not been used to allocate costs within tables 21 and 22.

The code allocated to any individual item of expenditure is a combination of the five codes described above. Acceptable combinations are written into the accounting system and any code which does match these acceptable combinations will be rejected. In particular, the combinations link responsibility to location, service activity to location and service activity to responsibility. These restrictions limit opportunities for errors to occur as costs are coded.

30.5.2 General approach to cost allocation

The Company's methodology for the allocation of OPEX was as follows:

1. An abstract was taken from the general ledger, summing costs by "service activity" and by "expense type".

2. Direct costs were allocated by mapping from the matrix of costs created.

3. The remaining costs which could not be allocated to direct costs were allocated to either general and support expenditure or other operational expenditure in block B of tables 21 and 22.

4. Business activities were identified by abstracting all costs within specified responsibilities.

5. Local authority rates, doubtful debts and PPP unitary charge were identified by expense type.

6. Third party services were identified as costs coded to the service activity for rechargeable works.

The remaining costs were allocated to general and support costs. This includes the general service activity relating to the general management and administration of the business.

30.5.3 Allocation of costs incurred at a given location across sub-service areas

A common issue relating to cost allocation within the regulatory accounts is the need to allocate costs identified against a particular asset across different sub-service areas. For example, the allocation of costs incurred at a sewage treatment works between the sewage treatment and sludge treatment functions at the works. The NI Water coding systems allows this allocation to be made by splitting costs between appropriate sewage treatment and sludge treatment "service activities". We understand that allocation between sub-service areas is not complete. For example:

1. Power costs are generally allocated by the prime service activity which, in most cases is sewage treatment. Sludge process on sewage treatment works are generally not allocated any power cost.

2. Conversely, all power costs to Duncrue Street, the largest wastewater treatment works in Northern Ireland, are allocated to the sludge incinerator with only a small power cost allocation to the treatment works.

3. Similarly, there appears to be little operational labour allocated to sludge dewatering and treatment processes on sewage treatment sites.

4. All power costs to water treatment works have been to the primary service activity of water resource and treatment. A major part of the pumping costs at a water treatment works can relate to pumping off site into distribution.

We believe that these costs should be allocated to water distribution rather than resource and treatment.

We recommend that NI Water considers these allocations for future returns. This could be done by either:

- Coding the allocations when the costs are entered into the general ledger.
- Carrying out an allocation at year end outside the accounting systems.

In either event, we recommend that a clear record is kept of the basis of the allocation, linking the allocation to records of assets of consumptions to support the allocation made.

30.5.4 Terminal pumping station costs

The reporting requirements ask for costs of sewage service terminal pumping stations to be identified separately for the purposes of Tables 17. Terminal pumping stations can be located on a treatment works or can be on the network remote from the treatment works. For the current return the Company has not:

- Identified the costs of terminal pumping stations located on treatment works (and with in the relevant sewage treatment cost centre) to allow the costs to be separated from other costs recorded at the works for the purpose of Table 17.
- Has not identified terminal pumping located remote from the treatment works (and included in the networks cost centre) to allow the costs to be allocated to sewage treatment.

We recommend that the Company reviews the allocation of terminal pumping station costs for future years.

30.5.5 Allocation of general and support costs.

General and support costs were allocated to three groupings:

- Group 1 - General management and administrative costs which cannot be attributed to any particular part of the service provided.
- Group 2 - General and support services which could be attributed the either the water service or the wastewater service only. For the wastewater service, this included the residual costs in the general service activity relating to wastewater treatment.
- Group 3 - The residual costs in the general service activity code relating to water and sewerage networks.

These three groupings of general and support costs were allocated across the sub-service areas as follows:

- Group 1 - In proportion to the direct costed wage charge for each sub-service area.
- Group 2 – In proportion to the direct costed wage charge for each sub service in the relevant water or sewerage service area.
- Group 3 – In proportion to actual costs coded against responsibility codes.

The allocation of general and support expenditure is not unreasonable at a global level. A more granular analysis considering individual types of expenditure and relevant cost drivers would provide a more robust analysis.

The structure of the general service activity codes can limit the ability of the Company to allocate labour costs between direct and general and support costs for table 21 and 22. For example: the supply function general service activity aligns directly to column 1 of Table 21 (water resource and treatment). This allows any residual labour balance in this general service activity to be mapped to direct costs. However, any residual labour balance in the network function activity must be allocated between sewerage and water networks. The Company does this by allocating the balance to general and support expenditure. This limitation and methodology creates a difference in approach to cost allocation within different service sub-areas.

The creation of additional general service activity codes would allow residual costs in general service activity areas to be allocated to direct costs and improve the overall cost allocation.

30.5.6 Allocation of direct labour costs to the general ledger

Operational labour is allocated to a home cost centre which is defined by a general service activity code and a responsibility code. The general service activity codes relating to direct costs are:

- Supply function activity covering water resource and treatment.
- Network function activity covering both water and sewerage networks.
- Wastewater function activity covering sewage treatment and sludge treatment/disposal.
- Customer service function.
- Transport management group function activity.

Employment costs of direct labour are allocated to on the basis of timesheets completed by industrial operatives.

There are two key types of timesheet entry:

- Non-productive time such as holiday and sick leave which is coded to the home costs centre only.
- Productive time is coded to the appropriate cost centre which is a combination of specific responsibility code, service activity and location code. There is a matching coding to the home cost centre.

Costs are recharged to productive activities based on these timesheets. The recharge includes an allowance for employment on-costs and non-productive time. The basic labour recharge rate is calculated weekly for each operative.

In addition to the industrial labour charge, the home cost centre receives the labour costs of relevant salaried managers. These management costs are charged at a proportion of the operational labour recharges. The proportion can be varied but appears to be set for the year, with different proportions set for different service areas.

The approach adopted for the reallocation of labour costs from the home cost centres (under the general service activity codes) to the "productive" cost centres can leave a residual cost in the home cost centre for the following reasons:

- Time-sheeted staff carry out administrative duties which are charged back to the home cost centre.
- There is a higher than expected level of non-productive time such as sick leave which is coded to the home cost centre.
- The wages recovery rate is not correct resulting in a residual due to under-recovery of over-recovery through wages recharges.
- The factor applied to distribute salaried manager costs is not correct resulting in a residual due to under-recovery of over-recovery through wages recharges.

Because the Company has not aligned the general service activity codes with the sub-service areas in tables 21 and 22, it is not possible to allocate these labour costs to direct cost cells in tables 21 and 22 and for some areas, the costs are allocated to general and support costs. The allocation of labour costs to the direct cost category could be improved by one of the following:

- the creation of additional general service activity codes;
- inspection of the existing accounts at responsibility code; or,
- varying the wages overhead distribution factors regularly to ensure that individual home cost centres are cleared at the end of appropriate accounting periods.

The accuracy of labour cost allocation depends on the accuracy of completion of timesheets by operational labour. There is a tendency in all systems to book time to a general code or a major location. If the number of locations is increased to improve cost capture to individual assets, the plethora of codes created might reduce quality of cost capture. This could be overcome if any increase in the number of location codes proceeds in parallel with the introduction of mobile work management which could automate time capture.

In some cases, it is possible that the allocation of labour costs between sub-service areas based a single location could be improved. For example: inspection of the accounts showed little labour cost allocated to sludge treatment at sewage treatment works with dewatering centres whereas polymer costs at the same location were properly allocated to sludge treatment.

30.5.7 Allocation of electricity bills

The Company receives electricity bills itemised by supply point (meter) which can be matched to a particular asset or location. Bills are now received in electronic format. All power bills are received at a single point in the Company and allocated centrally through an automated process.

NI Water advised us that more that 95% of electricity costs are now billed monthly with the remaining supplies billed quarterly. As a result, any inaccuracy relating to year end accruals is likely to be small.

NI Water has advised us that monthly billing is based on automated half hourly reading of meters. Therefore there should not be material inaccuracies at year end relating to bills based on estimated meter readings.

Power bills are allocated to location codes and are allocated to the primary service activity relating to that location. As a result, power bills are not properly allocated between sub-service areas. In particular:

- Power costs of pumping water from treatment works into distribution are included in the water treatment and resources and not allocated to water distribution.
- Power costs at sewage treatment works are generally coded to sewage treatment with no cost allocated to sludge treatment.

The exception to the above is that all power costs at Belfast STW are allocated to the sludge incinerator whereas a major part of the cost should be allocated to sludge treatment.

Overall we concluded that process in place to allocate power costs are robust.

NI Water has arrangements with a Company to generate power at two sites with the power sold to NIE. NI Water receives the income from the sale of power.

30.5.8 Allocation of vehicle costs

Vehicle and plant costs are allocated in a similar way to labour. Vehicles are allocated to individual home cost centres under the general service activity codes. In general, this is the same home cost centre as the member of staff responsible for the vehicle. A cost for the vehicle is charged to the home cost centre and credited to the transport management group which bears the costs of the provision of vehicles.

Logs of vehicle use are maintained and costs charged to "productive" cost centres at an hourly rate with a credit to the home cost centre.

The allocation of vehicle costs to direct costs is dependent on the completion of vehicle logs separate from the timesheets also completed by staff. Inspection of the accounts for one home cost centre indicated that this process is not complete with the potential for missing or late entry of vehicle logs. The process could be improved one of the following:

- reinforcing the completion of vehicle logs;
- inspection of the existing accounts at responsibility code;
- allocating vehicles to staff members and allocating costs in line with timesheet, although this creates a link of member of staff to vehicle which might not hold true in all circumstances;
- the introduction of technology based on mobile work management or vehicle trackers to allocated costs.

We understand that the internal recharge rate for vehicles includes an element of depreciation.

30.6 Commentary on Individual Line Entries, Including Confidence Grades

30.6.1 Table 21 - Block A – Direct Costs

Line 1 The total employment costs reported in Tables 21 and 22 are £33.24 million. This represents 52 % of the total employment costs in NI Water, with the remaining costs mostly allocated to general and support expenditure.

We have described the methodology used to allocate direct labour above.

Line 2 Direct cost of power

The direct cost of power includes electricity costs other fuels for power generation.

Most of the power cost allocated is electricity costs. We have described the methodology used to allocate electricity costs above and concluded that it is robust. We have noted that power bills are generally allocated to the primary service activity on a site and not split between sub-service areas where appropriate.

Some limited fuel costs are also included in line 2. We note that part of the power cost allocated to the Duncrue Street incinerator is fuel oil burnt in the incinerator when should cannot be dewatered to autothermic solids content. We recommend that the Utility Regulator considers whether this cost should be reported as a fuel rather than a consumable.

Line 3 The Company reports no costs of agencies.

Line 4 The Company allocates the costs of hired and contracted services through the same coding systems used for other costs. Costs are generally allocated on a goods received note. In many cases costs can be coded to a single service activity, allowing robust allocation in Tables 21 and 22.

Inspection of the general ledger indicated that coding of costs at the level required for tables 21 and 22 was reasonable. For example: sludge haulage costs and network repair costs appeared to be coded correctly.

Line 5 We understand that the Company does not have any associated companies. The Company reports no transactions with associated companies.

Line 6 The Company allocates the costs of materials and consumables through the same coding systems used for other costs. Costs are generally allocated on a goods received note. In many cases costs can be coded to a single service activity, allowing robust allocation in Tables 21 and 22.

Inspection of the general ledger indicated that coding of costs at the level required for tables 21 and 22 was reasonable. For example: costs of polymer received at sewage treatment works had been coded to the sludge treatment service activity.

Line 7 The Company reports no service charges for either the water service or the sewerage service.

Water and sewerage companies in England, Wales and Scotland are pay for the independent environmental quality regulators through charges covering:

- Water abstraction licences.

- Intermittent discharge consents or licences.
- Continuous discharge consents or licences.

We recommend that the Company addresses fact that it does not pay these fees as a special factor when considering future business plan submissions to the Utility Regulator.

Line 8 We understand that the Company does not receive bulk supply imports. No costs of bulk supply imports are reported.

Line 9 The Company reports internal vehicle and plant recharges as other direct costs.

We have commented on the methodology used to allocate vehicle costs above. We have concluded that the further improvements could be made to minimise the residual cost of vehicles allocated to general and support.

Line 10 Total direct costs are the sum of the preceding lines calculated within the table.

30.6.2 Table 21 - Block A – General and Support Expenditure

Line 11 General and support expenditure.

The allocation of general and support expenditure is described in the methodology section above.

The overall level of general and support expenditure is higher as a proportion of functional expenditure than the average for water and sewerage companies in England & Wales.

The general and support expenditure allocated includes the residuals under general service activity codes which are direct costs but which could not be mapped to individual sub-service areas.

Providing additional general service activity codes to match the sub-service areas in tables 21 and 22 would improve the allocation of costs between direct costs and general and support expenditure.

30.6.3 Table 21 - Block B – Operating Expenditure

Line 13 Customer services costs have been identified from the general ledger by abstracting all costs relating to defined areas of responsibility relating to the Customer Services directorate.

No allowance is made for the costs of buildings, information technology or other general and support services required to support customer services.

Reported costs include the costs of the Crystal Alliance contract for customer contact and customer billing.

Costs have been allocated between the water and sewerage services in proportion to the total direct expenditure in each service area. Further more

detailed analysis could provide improve cost allocation drivers such as the numbers of contacts responded to or the number of bills issued.

Line 14 Scientific services cost have been identified from the general ledger by abstracting all costs relating to defined areas of responsibility relating to scientific services.

No allowance is made for the costs of buildings, information technology or other general and support services required to support customer services.

Reported costs include the costs of sampling and testing carried out in-house by NI Water. This includes regulatory sampling and testing against wastewater discharge consents which is normally carried out by the environmental quality regulator in England and Wales with water and sewerage companies paying for the service through service charges.

Costs have been allocated between the water and sewerage services in proportion to the total direct expenditure in each service area. Further more detailed analysis could provide improve cost allocation drivers such the number or cost of sampling and testing of different types.

Line 15 Other business activities costs have been identified from the general ledger by abstracting all costs relating to defined areas of responsibility covering regulation.

Reported costs include staff of the regulation department, payments to the Utility Regulator and consultants' fees including reporting services.

No allowance is made for the costs of buildings, information technology or other general and support services required to support customer services.

Costs have been allocated between the water and sewerage services in proportion to the total direct expenditure in each service area.

Line 16 Total business activities is the sum of line 13 to 15 above.

Line 17 Business rates are paid as a cumulo for the water service and against rating valuations for individual assets for the sewerage service. The costs have been coded to the accounts and allocated between service areas on this basis.

It has been assumed that all rates payments relating to depots and offices relate to the sewerage service. In part, these buildings are used by both service areas.

All rates have been allocated to Line 20. No allocation has been made to other areas of the service, particularly 3rd party and unregulated business costs.

Line 18 The Company has reported a negative provision for doubtful debt. This reflects a reduction in provision due to the non introduction of domestic charging.

The Company has allocated all doubtful debt to the water service. We understand that a small element of the doubtful debt does relate to trade effluent and should be allocated to the sewerage service. The Company has not been able to identify this allocation. It believes that the provision for doubtful debt relating to trade effluent is small.

In the report year the Company has only billed customers directly for metered water supplies and trade effluent with the balance of revenue obtained from government subsidy. As a result, the level of doubtful debt is materially lower than for water and sewerage companies in England & Wales.

Line 19 The Company has reported no exceptional items in the year.

The Company has commented on the cost of restructuring in the report year including the costs of VER and BIP which will be atypical of the long term costs of the business.

Line 20 Total OPEX less 3rd parties is the sum of the functional expenditure and other operating expenditure defined above.

Line 21 The Company has allocated the direct costs of rechargeable work to 3rd party services. We understand that this relates to repairs of apparatus following damage by 3rd parties or the provision or movement of apparatus requested by 3rd parties.

The private septic tank emptying service provided by NI Water is allocated to unregulated business and excluded from the regulated accounts.

In some cases the Company may be called out to sewer blockage and collapse which occur on private laterals and drains. The Company has not recharged the cost of these call outs and any work carried out as a result.

The Company has not allocated any general and support costs to third party services.

Line 21a In table 21, the Company has reported no PPP unitary charges for the water service in the report year. The Alpha PPP concession will come on stream in 2008-08 and a substantial PPP unitary charge is expected in subsequent Annual Information Returns.

In Table 22, costs incurred in the report year relate to the PPP unitary charge for Kinnegar STW and the unitary charge for the initial phase of the North Down section of the Omega PPP concession.

NI Water has commented on the allocation of unitary charge between OPEX and CAPEX.

NI Water has identified costs of administrating the PPP concessions in its commentary. We recommend that NI Water assesses and reports on other costs incurred by the Company linked to the PPP concessions. In particular, the Company should develop systems which will identify all costs associated costs of services provided through the PPP concession for to align with appropriate explanatory factors. For example: rates or power costs paid directly by NI Water or and costs of hauling sludge to PPP works for sludge treatment and disposal.

NI Water has not completed table 22 in respect of the detailed PPP operating costs breakdown required by the Utility Regulator.

Line 22 Total operating expenditure is the sum of the costs above.

30.6.4 Table 21 - Block C – Reactive and Planned Maintenance

The Company has allocated costs of planned and reactive maintenance on the basis of costs allocated to selected service activity codes. The costs allocated are the direct costs of planned and reactive maintenance.

Line 23 Planned and reactive maintenance infrastructure.

In the water service, the Company has identified planned and reactive maintenance for water distribution only. No costs have been identified for planned and reactive maintenance on water resources such as dams and aquaducts. Costs allocated for water distribution include: mains repair and maintenance; leakage monitoring and detection; and consumer meter repair and maintenance.

In the sewerage service, the Company has identified planned and reactive maintenance costs for sewerage only. Costs allocated for sewerage repair and maintenance include: sewer inspection and sewer repair; and, blockage clearance and desilting.

Line 24 Planned and reactive maintenance – non-infrastructure.

The costs of water service non-infrastructure planned and reactive maintenance includes the costs of operating and maintaining pumping stations and service reservoirs. The costs of pumping stations appear to include the full operating costs (including power costs) and is not limited to repair an maintenance.

Similarly, for the sewerage service, the non-infrastructure planned and reactive maintenance costs are dominated by the full operating and maintenance costs of sewage pumping (including power costs). It is not limited to repair and maintenance costs.

We recommend that the Company considers its methodology for separating maintenance costs from other general operating costs.

30.6.5 Table 21 - Block D – Capital Maintenance

Line 25 Water service infrastructure renewals charge (excluding third party services) is the total charge for the water service reported in Table 33 Column 2.

Sewerage service infrastructure renewals charge (excluding third party services) is the total charge for the sewerage service reported in Table 33 Column 4.

Line 26 Water service current cost depreciation is the total charge for the water service reported in Table 33 Column 2.

Sewerage service current cost depreciation is the total charge for the sewerage service reported in Table 33 Column 4.

Line 27 We have not audited the amortisation of deferred credits in the report year.

Line 28 The Company as not reported any amortisation of intangible assets in the report year.

Line 29 The Company has reported no business activities current cost depreciation non-allocated in the report year.

Line 30 Capital maintenance (excluding third party services) is the sum of the capital maintenance changes above.

Line 31 The Company reports no current cost depreciation for the provision of third party services. The Company employs assets in the provision of third party services. The Company also employs assets in the provision of unregulated activities. We recommend that the Company assesses the level of depreciation associated with these assets.

Line 32 The Company reports no infrastructure renewals charge for third party services. The Company employs assets in the provision of third party services. The Company also employs assets in the provision of unregulated activities. We recommend that the Company considers whether there is any infrastructure renewals charge associated with these assets.

Line 33 Total capital maintenance is the sum of Lines 30 to 32 above, calculated within the table.

Line 34 Total operating costs is the sum of lines 22 and 33 above, calculated within the table.

31 TABLE 25 – ANALYSIS OF FIXED ASSETS BY ASSET TYPE

31.1 Key Points

1. The Company has not entered any AMP adjustment in Table 25, line2 or lines 8 to 10.

32 TABLE 32 – ANALYSIS OF FIXED ASSET ADDITIONS AND ASSET MAINTENANCE BY ASSET TYPE

32.1 Key Points

1. In this section of the report we have commented on the Company's methodology for collating and allocating costs which relates to Tables 32, 32A, 35, 35A, 36, 36A, 37 and 38.

2. The Company has fully populated Table 32 providing an allocation of capital expenditure on fixed asset additions and asset maintenance by asset type. Total capital investment of £274.149 reconciles to the following:

Source	Description	Value (£m)
Table 35 line 28	Total CAPEX excluding adopted and nil cost assets	80.389
Table 36 line 25	Total CAPEX excluding adopted and nil cost assets	173.896
Table 36 line 20	Assets adopted or acquired at nil cost	19.859
Total		274.144

3. The Company has developed its processes for capital investment driver allocation (CIDA). A detailed allocation manual has been prepared. Processes have been put in place supported by external resource and training has been undertaken across the Company. We have commented on systems of capital allocation in Section 32.6 below and highlighted particular issues arising.

4. We suggest that the Company considers how it could improve its systems to give greater visibility of project costs for each table and line entry. This would allow the Company to better track the content of each table entry and confirm that the allocation system had followed the methodology.

5. The Company has allocated £36.85 million (14.6%) to address a backlog in base maintenance. The expenditure has been reported as an addition under "enhanced service level". It includes investment to address past growth at sewage treatment works and like for like replacement of sewers in structural performance grade 5.

6. Expenditure in the year includes completion of schemes which, at the time the Strategic Business Plan was prepared, the Company had assumed would be completed in 2006-07. This is a drain on resources available to the Company to deliver the outputs of the Strategic Business Plan.

32.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of a series of meetings with the Company. During the audit meetings we:

- reviewed the methodology and documentation used by the Company to complete capital allocation;
- reviewed the data sources and assumptions used by the Company in the analysis;
- audited a sample of projects to confirm how allocation rules had been applied in practice, projects were selected partly at random and partly to test particular issues;
- analysed proportions of expenditure to Q, B, E and G drivers at a programme level;
- reconciled expenditure with the investment programme, other Annual Information Return tables and the Annual Accounts;
- on a sample basis confirmed whether the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement except as set out in the Company's commentary;

32.3 Reconciliation with the Capital Accounts

Overall reconciliation

The figures reported in AIR 08 have been taken from various management systems and subject to further processing to complete the AIR08 tables. These systems draw information from the Company's accounts. As information is processed, limited errors occur due to rounding and other processes. We understand that the reconciliation between the capital expenditure in the Company's Annual Report and Accounts and the AIR tables is as follows:

Capital expenditure reported in the Annual Report and Accounts	254.181
Rounding errors on data entry to CAPTRAX	(0.039)
Accruals in CAPTRAX for committed spend not in the financial ledger	0.157
Rounding in the CIDA project allocation	0.030
Capital income against infrastructure renewals (netted of for table 32)	(1.542)
Assets adopted at nil cost	19.859
Balancing item of unidentified changes	(0.039)
Total investment reported in Table 32	272.607

NI Water has advised us that the capital expenditure reported in this section of the Annual Information Return excludes £524 k of capitalised PPP expenditure.

Reconciliation of individual transactions

Individual capital transactions are recorded on the Company's accounts ledgers against individual projects. During our audit of a sample of projects we were able to inspect a sample of transactions totalling to the reported project expenditure on CAPTRAX. In the main, the transactions relate to monthly payments to contractors and advisers based on monthly valuations or invoices.

During our audit we were able to reconcile a sample of transactions with certified contractor valuations and were able to confirm that the contractor valuations were consistent with the scope of work and progress on the project. While we were able to take comfort from our limited sample audit that the transactions allocated to individual projects did relate to those projects, our audit does not constitute a financial audit of the contracts concerned.

Capital accruals

The Company has advised us that the reported capital expenditure at year-end includes accruals to the value of £51.3m million for work done but not yet paid for. We understand that the Company inherited accruals for work done but not paid for at the end of 2006-07 to the value of £36.6 million.

The capital accrual for work done but not paid at the end of 2007/8 accruals is 20% of the annual programme cost, representing 10 weeks work. These appear high for a capital programme of work paid against monthly valuations. The Company notes the level of accruals is affected by:

- Accruals for wayleaves and compensation payments which can take 6 months to 2 years to resolve.
- Payments to medium sized contractors, mainly working on water mains and sewer contracts. These contractors tend to invoice at the end of the contracts which extend up to 6 months.

Accrual for pain gain payments

Part of the capital programme is delivered on the basis of target costs contracts with individual project pain/gain incentive mechanisms. NI Water advised us that accruals are adjusted for pain gain payments as soon as reasonably robust estimates are available, and generally in advance of the final accounts stage.

32.4 Sources of Expenditure Information

In addition to the PPP programme, which is not covered by this Annual Information Return, NI Water runs two linked capital programmes.

- The Engineering and Procurement (E&P) programme with spend in 2007/8 of £214.392m, excluding overheads and salaries.
- Capitalised salaries for the Engineering and Procurement capital works programme of £6.152 million.
- The Operational Capital programme with spend of £33.744m in 2007/8, which includes capitalised overheads and salaries of £1.952 million.

The E&P programme is the main capital delivery programme for new works and major maintenance projects. The programme is recorded on the CAPTRAX system. CAPTRAX holds data on contract costs (construction costs, consultant costs, design and contract supervision). These costs are transferred from the Company's accounts monthly and rounded to the nearest £1000. Other salaries and overheads, relating to the E&P managed capital programme are held on the enterprise ledger system Oracle. CAPTRAX is also used to manage the programme of work and records information on the project approval process.

For the Operational Capital programme, ORACLE holds details of all project expenditures, in pounds and pence. Projects are entered into the programme using a Project Set-up form. Projects in this programme are mainly of small value, consisting of capital maintenance projects run by Operations. It includes capitalised minor works. In general, expenditure in excess £3000 will be capitalised if it meets criteria in respect of extending the life of the Company's assets. There is no upper project value limit for this programme and it includes projects with values up to £1.1m. Theses high value projects are mainly prior year projects with small value completion items, such as defect correction or land compensation outstanding.

32.5 Capital Allocation Methodology

For the production of the Annual Information Return, two separate datasets are produced from the two main programmes of work and merged to form the tables. The process used for the collation and allocation of costs is described in the following sections.

32.5.1 E&P Programme

For E&P projects, information from the following sources is uploaded to the "non-land cost database as follows:

- Information on contract costs, taken from CAPTRAX.
- Overheads and salaries, wayleave and easement costs, taken from ORACLE.
- Investment drivers, taken from the CIDA Tracker.

Information on land acquisition costs from ORACLE and investment drivers from the CIDA Tracker are uploaded to the Land Cost database. The allocation of land costs to projects is the responsibility of project managers.

Outputs from the Non-land Cost database and Land Cost database are then downloaded to the CIDA Rollup spreadsheet, which processes the data and produces a version of the Annual Information Return tables relating to E&P projects only. The audit trail was followed for a number of table lines from base data to the CIDA Rollup spreadsheet and the information reconciled.

32.5.2 Non-E&P Programme

For the Non-E&P programme, information on investment drivers is taken from the Assets In Course of Construction (AICC) register, where CIDA allocation has been applied.

For part of AIR08, the Project Set-up form used as the point of entry to AICC did not include CIDA driver allocation, which was completed as a separate exercise.

Information on capital costs is taken from ORACLE. Cost and driver information are combined into the "QBEG Analysis For Total Capital Spend" spreadsheet, which processes the data and produces a version of the Annual Information Return tables relating to non-E&P projects only.

32.5.3 Comments on Methodology

The Annual Information Return tables are built up from a number of different sources which have limited compatibility. This necessitates a complex multi-stage process with many manual interventions and significant interpretation. In the report year manual calculation was used to allocate investment drivers to 80% of E&P projects with this process being automated for future years.

Cost data held in CAPTRAX are rounded to the nearest thousand pounds. Rounding errors make it difficult to reconcile costs to the ledger.

NI Water has recognised that these factors give rise to increased potential for error and hopes in the longer term to move to a single consistent corporate database for capital investment projects. This would clearly be of value. We believe that management of the investment programmes and data would be simplified if all investment projects, both E&P and non-E&P are held in a single investment management system, which applies consistent investment driver allocation and includes all project costs, held in pounds and pence.

The current systems do not provide easy visibility of the project level content of each individual line entry in the AIR tables. This type of facility would be helpful, allowing the Company to easily identify the project level content of each line entry, confirm that the allocation system had worked as expected, and allow anomalies to be identified and errors corrected.

32.6 Table 32 - Capital Cost Allocation

32.6.1 Key points relation to capital cost allocation

We have described and commented on the capital allocation methodology adopted by the Company below. Key points relating to capital allocation are as follows:

1. The AIR08 report is based on a capital allocation carried out in September 2007. This reflected the status of projects at that time and does not reflect project information at year end. In some cases, projects with material spend in the year have been allocated to a single purpose code when a multiple allocation would have been appropriate.

2. The allocation between water and sewage services is robust relying mainly on direct allocation with only 1.1% of cost allocation based on a general apportionment.

3. We concluded that the allocation by asset type is robust.

4. There are material differences between the allocation by QBEG at the SBP and the AIR08. In particular:

    i. Costs from mains replacement have not been allocated to backlog base maintenance in the AIR08.

    ii. Possible errors in some sewage treatment works allocations have resulted in a movement in allocation from quality drivers to growth drivers.

5. Overall, we concluded that further work will be required on QBEG allocation to provide a consistent approach and comparison between the SBP programme and actual expenditure.

32.6.2 Introduction

NI Water has developed a comprehensive system of capital cost allocation which covers all projects. This is known as the Capital Investment Driver Allocation (CIDA) process. This is described below and provides information relevant to Tables 32, 32A, 35, 36, 37 and 38.

A single allocation sheet is prepared for each project covering:

- Allocation between water and sewerage services.
- Allocation by asset type including the allocation between infrastructure and non-infrastructure.
- Allocation by Quality, Base, Enhanced Level of Service or Growth (QBEG).
- Allocation of quality investment by quality drivers.

We have commented on each aspect of the allocation below.

32.6.3 Capital Allocation Manual

During the report year, NI Water has developed a comprehensive process for allocating drivers on a QBEG (Quality, Base Service, Enhanced Service Level, Growth) basis. This is described in the Capital Investment Driver Allocation Manual (CIDAM), which has been developed in line with Ofwat procedures. The manual was reviewed. It gives guidance on:

- The identification of project components by asset category (eg water non-infrastructure) asset type (eg water treatment works) and sub-asset component (eg clarifier). Land acquisition is included as a separate sub-asset component.
- Asset life
- Project objectives
- Investment drivers
- Investment sub-driver selection for quality projects
- Proportional allocation to investment drivers
- Rules for the calculation of pre-emptive maintenance and incidental maintenance
- For management and general projects, the split between costs to the water and wastewater services

The manual also provides worked examples and makes reference to Ofwat's Regulatory Accounting Guideline 2.03.

32.6.4 Thresholds for Proportional Allocation of Expenditure

NI Water procedures require that proportional allocation of expenditure be applied to all projects costing over £100000. Below this figure prime cost allocation is to be used.

Cost allocation was not done prior to the current year and there was a large backlog of projects which have not been allocated. NI Water has completed an exercise to allocate costs for the most significant projects including all projects with a 2007/8 expenditure exceeding £40000 or 10% of total project expenditure have had costs allocated. 731 projects with a total cost of £12.4m currently have no cost allocation. NI Water intends to continue to reduce the size of this backlog.

For the Annual Information Return, the total cost of projects without an allocation was spread over the cost categories in the same proportions as those with allocations, excluding management and general projects.

32.6.5 Project Analysis

The information required to complete project allocation was collected for both the E&P and non-E&P programmes using spreadsheets, following project manager training. Standard templates were used to guide driver selection and prevent ineligible combinations. This exercise was completed in two phases:

- Data were initially analysed by hand to give allocation proportions. Manual processing was applied to approximately 80% of projects analysed. Although only three individuals were involved in this process for consistency, manual calculation gives rise to greater potential for error than spreadsheet calculation.

- For the remaining 20% of projects, spreadsheet analysis was used to provide proportional allocations. Spreadsheets did not require project managers to select drivers but to enter factual information to allow automatic driver selection. Checking routines were built into the spreadsheet, for example on project totals. Following completion of both manual data and spreadsheets a manual checking exercise was undertaken. After checking, the data were uploaded to the CIDA Tracker spreadsheet, which contained the assessed drivers for each project, but no costs.

In addition to the above process, a small number of very large projects, such as the Belfast Sewer Project, were subject to individual assessment by their project manager, applying CIDA principles to the project appraisal report.

All new projects are required to have driver allocation using CIDA. It is recommended that NI Water should continue to reduce the backlog of projects without driver allocation.

32.6.6 Capital Cost Allocation by Service

In most cases the allocation between the water and sewerage services is by project, with most projects delivering assets which relate entirely to either the water service or the sewerage service. This reflects the nature of the major assets worked on and the management of programmes of maintenance work and is common across the water industry.

For a very small number of individual projects it was necessary to allocate project costs between the water and sewerage service. These are generally developer-led projects where both mains and sewers are laid before development takes place. Allocation was done by inspection of the individual assets delivered by the project.

For management and general investment the Company has relied mainly on specific allocation of costs relating to either the water or sewerage services. However, part of the management and general programme supports activities across the business and cannot be allocated directly to the water and sewerage service. In these circumstances the Company has allocated the expenditure 41% to the water service and 59% to the sewerage service. This split is the same as that used for the SBP, which was based on an analysis of the 5-year E&P programme, excluding management and general projects, as it stood at the time the SBP was prepared. The value of projects allocated using this method is small, amounting to only £1.2m in the report year.

In summary, capital cost allocation by service area is as follows:

- 98.4% of investment was allocated between the water and sewerage service on a project by project basis. This includes management and general projects covering 7.3% of total investment.

- 0.5% of investment was allocated by a split of costs by asset based on an inspection of individual projects.

- 1.1% of investment was allocated between the water and sewerage service on a nominal allocation . This included 0.5% of known management and general expenditure allocated on the basis of a 41:59 ratio between the water and sewerage service (as in the SBP). The balance of 0.6% of expenditure had no driver allocation. This was allocated to management and general and proportionally allocated between the water and sewerage service in the ratio 33:67, in line with the proportions for expenditure which could be directly allocated to one service or the other.

The allocation between water and sewage services is robust relying mainly on direct allocation with only 1.1% of cost allocation based on a general apportionment.

32.6.7 Capital Allocation by Asset Type Including Infrastructure, Non-infrastructure Allocation.

The Company CIDA Manual (CIDAM) includes guidance on assessing asset category, including the allocation to water non-infrastructure, water infrastructure, sewerage infrastructure and sewerage non-infrastructure. The guidance includes lists of asset types in each category and these asset types are further defined in detail. The allocation is uncontroversial and during our audits no examples of incorrect allocation were found.

We conclude that the allocation by asset type is robust.

32.6.8 Capital Allocation by Purpose (QBEG)

The Company also allocates costs by the standard Quality – Base – Enhanced Service Level – Growth (QBEG) purpose codes which drive allocations for Tables 35 and 36.

The percentage split of expenditure in the 2007/8 investment programme was:

Service	Quality (Q)	Base (B)	Enhancement (E)	Growth (G)
Water	19.8%	48.0%	7.5%	24.7%
Sewerage	28.5%	16.7%	28.7%	26.1%

For the SBP, the Company considered QBEG allocation in seven sub-categories:

Description		QBEG
Q1	Catch-up quality	Q
Q2	New quality	Q
B	Base maintenance	B
BB	Backlog base maintenance	E
E	Enhanced level of service	E
G1	Catch-up growth	G
G2	New growth	G

In the following sub-sections we describe the general principles of the QBEG allocation and its application to some key areas of investment. Subsequent subsections describe the allocation of three areas of investment: sewerage assets, distribution zones and sewage treatment works.

Quality allocation

In both the SBP (as presented in the CIM) and in the AIR08 reports "catch-up quality" and "new quality" have been combined in the Quality allocation.

Sample of audits of sewage treatment works allocations indicate that material errors have occurred in the quality allocation for selected schemes. This appears to result quality allocation being under estimated for AIR08 with the allocation to growth and enhanced service level increasing.

Taking two major quality projects as examples and comparing the quality allocation at the SBP and the quality allocation at AIR08 gives:

Treatment works	Q Allocation	
	at SBP	AIR08
Milltown, Antrim WwTW	25%	2%
North Coast WwTW EC Compliance	44%	0%

We understand that the Company is undertaking a review of the allocation methodology to understand and address this issue.

Base Maintenance

The Company separates backlog base maintenance from base maintenance. This is intended to reflect the need to invest now to address any shortfall in maintenance investment in previous years. This concept of backlog base maintenance is generally not applied in the

regulation of the water industry in England, Wales and Scotland where maintenance expenditure is assumed to occur at a rate which addresses the deterioration of the assets and thus maintain serviceability.

An exception to this is where:

- Specific named programmes of work have been identified with defined outputs. For example, investment in treatment works which were failing consents at the time a Company was established and had not benefited from investment for other reasons.

- Where enhanced level of service programmes have been identified to provide a defined and measurable improvement in a level of service.

The CIDA manual sets out criteria for backlog base service provision in Appendix 1 which relates to the following:

- Improvements to a sewage treatment works currently classified as "at risk" or "fail" by the Company.

- Improvements to a sewage treatment works where operational capital expenditure >25k is required to avoid a probable failure or >50k spend is required to avoid an imminent failure at a sewage treatment works.

- Like for like replacement of sewers with a structural performance grade of 5.

- Like for like replacement of water mains with a condition grade of 4 or 5.

From our sample project audits of the capital programme we noted the following in respect of backlog base maintenance:

- The backlog base maintenance rule for replacement water mains does not appear to have been applied either in the SBP allocation or for the current year's spend. To maintain consistency with the SBP, we recommend that the backlog base maintenance rule in the CIDA manual should not be applied to water mains.

- Like for like replacement of sewers with a structural performance grade of 5 has been allocated to backlog base maintenance.

We note that for the Capital Investment Monitoring (CIM) submission, the Company has allocated backlog base maintenance to Base Service as opposed to Enhanced Service Level in line with understanding of the Utility Regulator's requirements for the CIM.

Enhanced level of service

At the SBP, allocation to enhanced level of service was limited to specific improvements such as a reduction in sewer flooding or improvement in water supply pressure.

For AIR08, NI Water has also allocated backlog base maintenance to enhanced level of service on the basis that any work to address under investment in previous years will improve levels of service. The Company does not identify specific service improvements against the investment allocated.

We understand that backlog base investment identified in the SBP was accounted for as an addition as opposed to maintenance. Allocating this category of expenditure will maintain consistency with the financial accounts if not the QBEG comparison in Table 35A and 36A.

Growth

The Company has not distinguished between catch up growth and new growth in its AIR08 allocations. Both elements of expenditure has been allocated to Growth and this appears to have been consistent for the SBP and the AIR08.

Growth is identified as future capacity over the nominal design capacity of the works. No assessment is made of the current capacity of the works based on the performance of current assets.

Pre-emptive and incidental maintenance allocation

Where an investment driver results in an asset being replaced before it has reached the end of its nominal life, the Company makes an allocation of the replacement value of the asset between "pre-emptive" and "incidental maintenance".

The replacement value of the asset is based on the proportion of original capacity to new capacity.

For this replacement value, pre-emptive maintenance is reported as the proportion of the existing asset age of the existing asset design life. The "pre-emptive" maintenance element is allocated to base maintenance. This approach matches a straight line depreciation of the asset and allocates the value of the asset depreciated to date to maintenance.

The remainder of the replacement value has been referred to as "incidental" maintenance. In effect, this is the residual value of the asset after depreciation to date which must be written off as a result of the investment. It has been allocated to the driver which prompted early replacement of the existing asset. We believe that this is reasonable.

While the approach adopted matches asset depreciation accounting it does not take account of the timing of investment which would have occurred later if replacement had not been triggered by another driver. The present value of this future investment would be less than implied by the straight-line approach to depreciation underlying the analysis. The "pre-emptive" allocation in the report year for the replacement of a functioning asset will increase the base maintenance reported without a matching maintenance benefit. We recommend that this approach is noted and considered by the Utility Regulator.

Allocation of study work

The Company has allocated drainage area study work and distribution zone studies to capital maintenance (management & general).

In most cases, these studies extend beyond general investigation and updating of records and are targeted at developing improvements. The work is carried out within projects which carry into delivery. In similar circumstances in England and Wales such as the deliver of Section 19 water mains programmes, investigation and development work is allocated in line with asset investment.

We recommend that NI Water:

- Considers the allocation of costs of drainage area studies and distribution zone studies to separate the general maintenance and updating of records from the specific investigations, development and design to deliver improvements.

- Ensures that the QBEG allocation is updated before asset investment is committed to reflect the outcome of individual studies.

- Considers a standard allocation for study work based on the historic outcome of similar projects which could be applied until specific solutions are developed and a specific cost allocation can be prepared.

We note that major studies to assess individual schemes are also allocated to base maintenance. We recommend that more detailed consideration should be given to these studies to allocate purpose codes in line with the investment drivers. We recognise that until the study is completed and particular solutions developed this will require an element of judgement.

Distribution Zone Projects

For the SBP the QBEG allocation of distribution zone projects was based on an analysis of a sample of completed projects.

For AIR08 the QBEG allocation for distribution zone projects is based, where possible, on specific allocation of individual lengths of pipe based on four replacement categories:

- Structural allocated to B - base maintenance
- Hydraulic allocated to G - growth
- Operational allocated to B - base maintenance
- Water quality allocated to Q – quality.

In the SBP an allocation was made to backlog base service with the associated investment included in the accounts as an enhancement. This approach has not been followed in the AIR08 allocations.

In England & Wales, it is assumed that water quality issues can be addressed by a spray lining and costs of replacement in excess of spray lining is allocated to base maintenance. We understand that NI Water has concluded that spray lining is not an effective method of addressing water quality issues and adopts pipe replacement as a matter of policy. The total cost of pipes replaced for water quality reasons have been allocated to quality.

In more recent updates of the allocation system NI Water has identified the upsizing of mains and has made a proportional allocation of costs between like for like replacement and upsizing. Up sizing is allocated to growth and like for like replacement allocated to the main driver. In the absence of a specific driver, like for like replacement is allocated to maintenance irrespective of whether the existing main had material defects. The allocation to growth is made on the marginal cost of upsizing the main as opposed to a proportional allocation on pipe area used for sewers.

As described above, initial study and development work is allocated to base maintenance (management and general) until a specific allocation can be developed on the basis of proposed works. In some cases the allocations are not updated early enough to capture investment on assets in the report year.

Sewerage asset improvements

Sample checks on sewerage asset improvements indicate that the allocations have been based on detailed asset information linked to specific drivers.

Proportional allocation has been adopted based on the cross sectional area of the sewer.

Like for like replacement of sewers in structural performance grade 5 have been allocated to backlog base maintenance which is reported in Table 32 as an addition.

Other like for like replacement of existing sewers have been allocated to base maintenance irrespective of whether the existing sewer had any material defects at present. For example, where a sewer which is in good condition is upsized for growth, a proportion of the cost is allocated to maintenance. In these circumstances, we believe that no maintenance benefit has been realised and the whole allocation should be to growth.

Sewage treatment works

In our sample audits we noted that there had been material changes in QBEG allocation between the SBP and AIR08. This appears to be due to errors in the methodology applied to some treatment works which resulted in quality investment being under reported and the allocation for growth increased. Further work will be required to identify and address the full impact of this.

We were concerned that the QBEG allocation for sewage treatment works did not clearly identify whether the new works was a complete replacement of the existing assets or whether the existing assets were retained and additional assets constructed.

At present the Company applies its allocation rules to a treatment works as a single asset. We recommend that individual processes on the treatment works are considered separately in the QBEG analysis.

For the purpose of Table 32, it is likely that the impact of any errors on sewage treatment allocation between additions and maintenance will be limited but we have not been able to confirm this through audit.

32.6.9 Allocation of Costs Between Quality Drivers

The CIDA Manual lists drinking water quality drivers in Appendix 2, but does not give guidance on splitting the quality element of a project between the individual drivers. Engineer's judgement is used to provide this split. Although few water treatment projects remain in the investment programme, it is recommended that NI Water develops guidance on this area.

For wastewater quality projects CIDAM provides guidance and the split is made in the same proportion as the scores given to various drivers by EHS.

32.7 Comments by Line

As the same methodology is used for the compilation of all lines in the table individual comments are not given by line.

33 TABLE 32A – SEWERAGE SERVICE BASE SERVICE MAINTENANCE EXPENDITURE DATA FOR CAPITAL MAINTENANCE ECONOMETRICS (CCA)

33.1 Key Points

1. Area boundaries within NI Water are being revised and it is not currently possible for the Company to split expenditures by area as required in this table. The data presented is for NI Water as a whole. It duplicates the summary information in Table 32.

2. For comments on audit approach, methodology and components of the information, reference should be made to our commentary on Table 32 above.

34 TABLE 33 – DEPRECIATION CHARGE BY ASSET TYPE

34.1 Table 33 - Key Points

Current cost depreciation charge for the year.

1. We have not audited the current cost depreciation charge for the year.

Infrastructure renewals charge

2. The Company has not completed data for the 2006-07.

3. The Company has based its infrastructure renewals charge on an average of estimated expenditure from 2002-03 to 2011-02.

4. The historic expenditure used is based on estimates for 2001-02 and 2006-07. Estimated expenditure for the intervening years is interpolated and may not reflect actual expenditure.

5. Estimated IRE for 2006-07 to 2013-14 has been taken from the Company's working papers for the SBP.

34.2 Table 33 - Block A – Current Cost Depreciation Charge for the Year

We have not audited the current cost depreciation charge for this return.

34.3 Table 33 - Block B – Infrastructure Renewals Charges, Expenditure and Provisions

34.3.1 Approach to audit

During the audit we met with Company staff to review the methodology adopted to estimate the infrastructure renewals charge. We confirmed the data used in the calculation against source data provided by the Company.

34.3.2 Commentary on Company methodology

The Company has not completed data for the 2006-07. Information from Northern Ireland Water Service has been used to calculate the IRC and this information could be used to estimate IRC for 2006-07 on a consistent basis with the 2007-08 IRC.

The infrastructure renewals charge is the average of NI Water's assessment of IRE over a ten year period from 2002-03 to 2011-12; a five year look back and a five year look forward including the report year.

Estimated IRE for 2006-07 to 2013-14 has been taken from the Company's SBP.

Historic information on infrastructure renewals expenditure by Northern Ireland Water Service from 2002-03 to 2006-07 has been based on the following:

- An assessment of IRE in 2001-02 prepared by NI Water Service as part of an internal June Return.

- An assessment of IRE in 2006-07 prepared by NI Water Service as part of the preparation of the SBP for 2007-14.

- Figures used for the intervening years 2002-03 to 2005-06 are a simple interpolation of the two assessments outline above and do not necessarily reflect actual levels of expenditure.

We have not audited the assessment of IRE prepared by NI Water Service in 2001-02. NI Water provided a copy of internal papers setting out the DRD Water Service – Annual Information Return 2002. We were able to confirm that the IRE figures used in the IRC calculation for 2001-02 were taken from this report and inflated to 2007-08 prices. We understand that the 2001-02 IRE estimate was based on an analysis of the largest projects in the year which generated 80% of total expenditure. We note that much of the asset maintenance spend is likely to be delivered through smaller projects include capitalised repairs. It is possible that the analysis of larger projects will under-estimate IRE in the year.

The IRE for 2006-07 was taken from the analysis carried out in preparation for the SBP which included an assessment of 2006-07 expenditure as well as expenditure for 2007-08 to 2013-14. This is the same information used to project forward IRE to 2011-12.

Because of the methodology used to determine the IRE in 2001-02 and the use of interpolated data for years 2002-03 to 2005-06, the IRC relies on estimated rather than actual historic data, adds to the uncertainty in the of the IRC as a reasonable reflection of the 10 year average spend.

We understand that the infrastructure renewals charge calculation is based on gross expenditure. We understand that the infrastructure renewals expenditure in Table 33 line 4 should reconcile to the net infrastructure expenditure in Lines 2 of tables 35 and 36. In the report year, the Company doe not report any grants and contributions against infrastructure renewals expenditure. Therefore gross and net infrastructure renewals expenditure are equal. We recommend that possible sources of grants and contributions for against infrastructure renewals expenditure are considered to insure that IRC and IRE are determined on a consistent basis for the future.

The Company has not carried out a specific assessment to confirm that the Infrastructure Renewals Charge is sufficient to maintain the assets in the medium term. We understand that the Company will consider this as it develops its assessments for PC10 and PC12 and would adjust the IRC on the outcome of these investigations.

The Company has not made any statement or explanations of the period over which it expects any infrastructure renewals accrual/prepayment to be wound out.

34.3.3 Commentary on individual line entries including confidence grades

Confidence grades are not required for the information reported in Tables 33.

Line 4 The infrastructure renewals expenditure reconciles to the infrastructure renewals expenditure net from Table 32 line 32 which reconciles to Table 35 and 36 line 2. The Company has not reported any grants and contributions against IRE in the report year and, therefore, gross and net IRE are equal. We understand that the IRC was calculated gross expenditure with no allowance for grants and contributions. We recommend that possible sources of grants and contributions for against infrastructure renewals expenditure are

considered to insure that IRC and IRE are determined on a consistent basis for the future.

Line 5 The calculation of the infrastructure renewals charge is described above.

Line 6 The Company has reported infrastructure renewals expenditure which is less than the infrastructure renewals charge. The Company has not provided an explanation of the period over which it expects this to be unwound.

35 TABLE 34 – ANALYSIS OF NON-INFRASTRUCTURE FIXED ASSET ADDITIONS BY LIFE CATEGORIES

35.1 Key Points

1. This table aligns with information audited for Table 32.

2. All financial data has been sourced from:

   i. CAPTRAX, which is NI Water's database for the management of the capital works programme and contains all project cost data with the exception of land, wayleaves and overhead costs.

   ii. The financial accounting system (Oracle) which records the costs excluded from CAPTRAX.

3. During 2007/08 a 'RAG2'-compliant 'Capital Investment Driver Allocation Manual' was written and used as the basis to build a relational database (CIDA) which allows the capital analysis of much of the project cost data to be automated. NI Water also has some operational capital projects which have been analysed manually and included in the allocation summary.

4. No data is entered in columns 1 and 3 because NI Water did not complete the table for the 2007 information return.

5. Totals in line 8 and line 14 reconcile to the non-infrastructure additions in Table 32 lines 16 and 33 respectively.

35.2 Table 34 - Blocks A, B &C – Non-infrastructure Asset Additions

35.2.1 Approach to audit

A meeting was held with Company staff responsible for the capital allocation for this and other related tables.

Limited data trails were conducted to establish confidence in the data presented and consistency with other tables in the information return, particularly table 32.

Sample audits were carried out on three projects selected at random to confirm the quality of the data.

35.2.2 Commentary on Company methodology

The allocation of non-infrastructure additions in Table 34 is based on the overall allocation of expenditure which we have reported on in Table 32. While we have identified a number of issues concerning QBEG allocation we believe that allocation of costs by service area and by asset required to complete Table 34 is reasonable.

The individual project allocations which underpin the data reported in Table 34 are based on an analysis of complete project costs. Expenditure on a project in any one year may be markedly different from the allocation for the project as a whole. For example early spend on a project may be on long life assets with short and medium life assets purchased later as the mechanical and electrical equipment is fitted out. However, over a portfolio of projects and over a limited number of years the allocation will reflect actual investment.

NI Water's allocation of assets to asset life categories uses only three of the possible five categorisations of asset life. The categories used are:

Asset life category	Asset life	Asset examples
Very short	up to 5 years	Stand-alone computers and small IT networks (5 years); cars (3 or 4 years); small vans (5 years)
Short	6-15 years	Larger vans; laboratory equipment (7 years) main ITsystems (6 - 10 years) ICA and telemetry; mobile pumps, compressors and generators; heavier vehicles; office equipment (10 years) Furniture; fencing; steel and grp tanks; other meters; machine tools; mechanical plant; digital mapping and geographical information systems (15 years).
Medium	16-30 years	Static pumps, generators, compressors, heavy cabling and switch gear, motors and starters (20 years)
Medium long	31-50 years	
Long	51+ years	Buildings, roads, concrete and brick structures (all 60 years)

NI Water advised us that where assets are replaced before they are fully depreciated the residual value is write down. This is consistent with the pre-emptive maintenance allocation.

35.2.3 Commentary on individual line entries including confidence grades

Lines 1, 9 and 15 - Very Short

NI Water has not used this asset life category in its analysis for Table 34. Some assets are likely to fall into this life category. We recommend that NI Water reviews its allocation to consider the full range of asset life categories

Lines 4, 12 and 18 - Medium Long

NI Water has not used this asset life category in its analysis for Table 34. Some assets are likely to fall into this life category. We recommend that NI Water reviews its allocation to consider the full range of asset life categories

Lines 16, 17 and 19 – Non Infrastructure Additions Average life)

These cell values are not calculated. Representative values were entered by inspection of the accounting lives used. They should therefore be taken as indicative only. Calculated mean, or weighted mean values may differ significantly from the values reported, particularly for the medium life assets.

36 TABLE 35 – WATER SERVICE - EXPENDITURE BY PURPOSE

36.1 Key Points

1. Information on additional Opex is incomplete. For the water service, the only additional costs included relate to Clay Lake WTW and Carran Hill WTW, the two water treatment works commissioned in the report year. No information is available on additional Opex arising from other water assets, such as pumping stations. The Company recognises the need to collect this information in future years.

2. There is currently no process in place to routinely capture and report information on changes in Opex as a result of Capex. The desirability of such a system, which would enable more accurate reporting for the Annual Information Return, help the budgeting process and inform the realisation of efficiencies, has been recognised by NI Water.

3. NI Water has set rules for proportional allocation of capital expenditure. which are set out in the Capital Investment Driver Allocation Manual (CIDAM). For projects estimated to cost under £100000 at inception prime cost allocation is used. For all projects in the Engineering and Procurement programme over £100000 in cost, proportional driver allocation is used and drivers can be revisited at each project approval stage. We have commented on capital cost allocation against Table 32.

36.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

- Our audit consisted of a series of meetings with the Company. During the audit meetings we:

- reviewed the methodology and documentation used by the Company to complete capital allocation;

- reviewed the data sources and assumptions used by the Company in the analysis;

- audited a number of projects to confirm how allocation rules had been applied in practice;

- on a sample basis confirmed whether the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement except as set out in the Company's commentary;

- reviewed the confidence grades ascribed to the reported data by the Company.

36.3 Base and Additional Operating Cost

Base operational expenditure has been calculated by taking total operating expenditure from Table 21 line 22 and deducting the total change in Opex arising from Capex, calculated as described below, to give base Opex.

Information on additional Opex is incomplete. For the water service, the only additional costs included relate to Clay Lake WTW and Carran Hill WTW, the two water treatment works commissioned in the report year. Opex costs for these works have been estimated by comparing 2006/7 operating costs, adjusted for inflation, with 2007/8 operating costs for the relevant sites. This calculation shows an increase in Opex for Clay Lake, but no change for Carran Hill.

Additional Opex costs estimated in this way was distributed by purpose code in the same proportions as the QBEG analysis for the capital project. It was assumed that no additional Opex would arise from Base expenditure additional OPEX was distributed in proportion to the QEG elements of the QBEG analysis.

No information is available on additional Opex arising from other water assets, such as new pumping stations. The Company recognises the need to collect this information in future years.

There is currently no process in place to routinely capture and report information on changes in Opex as a result of Capex. The need of such a system, which would enable more accurate reporting for the Annual Information Return, help the budgeting process and inform the realisation of efficiencies has been recognised by NI Water.

36.4 Proportional Allocation of Capital Expenditure

NI Water has set rules for proportional allocation of capital expenditure which are set out in the Capital Investment Driver Allocation Manual (CIDAM). The methodology is discussed in detail in our commentary on Table 32.

For projects estimated to cost under £100000 at inception prime cost allocation is used and a single investment driver is allocated. This can be reviewed at the completion of appraisal but in practice many projects of this value move straight to implementation and drivers are not reviewed as a matter of course. For all projects in the Engineering and Procurement programme over £100000 in cost, proportional driver allocation is used, in line with CIDAM and drivers can be revisited at each project approval stage.

Proportional allocation has been brought into use only in the report year and the Company has yet to complete an analysis of all on-going projects. The estimated total value of projects with no allocation completed is 4% of the programme total and this mainly relates to minor completion expenditure on prior year projects, rather than to new small value projects started in the year.

36.5 Allocation of Expenditure on Mains Rehabilitation to Quality

In the report year the Company has allocated work on water mains based on an allocation of each pipe subject to work.

In part, mains which have been replaced for quality reasons have been allocated to quality irrespective of the condition of the existing main or the size of the replacement main.

For more recent allocations, the Company developed its systems to allocate the cost of upsizing to growth based on the marginal costs of the upsized main.

In England & Wales, it is common practice to assume that the quality element of mains replacement is the cost of splay lining the existing main. The extra over cost of mains replacement is assumed to be maintenance. We understand that NI Water does not use spray lining as a rehabilitation technique and has not allocated costs on this basis.

Water mains rehabilitation cost allocation at the SBP was based on a sample of projects was analysed using engineering judgement and the results applied to all projects. It is not possible to confirm that the current methodology adopted by NI Water is consistent with the methodology used at the SBP.

36.6 Allocation of Quality Compliance and Maintenance Expenditure at WTWs

When practising proportional allocation for water treatment works, the practice is first to allocate the growth proportion, then the quality proportion and finally any the remainder to base. If particular assets correspond to the meeting of particular drivers then their cost is allocated directly to that driver.

36.7 Comments By Line

The methodology used for the allocation of capital has been discussed above and in our commentary on Table 32. Further comments on specific lines are given below.

Line 1 The base operating expenditure reconciles to the total OPEX in Table 21 less the additional OPEX due to CAPEX in Table 35. We have commented on the assessment of additional OPEX above.

Line 2 The Company has not identified grants and contributions against infrastructure renewals expenditure. The net expenditure in Line 2 equals the gross expenditure in Line 6.

In similar reports in England & Wales, the grants and contributions against infrastructure renewals expenditure includes the contributions from roads authorities and developers for the diversion of existing infrastructure assets to suit road works and new development (excluding the upsizing of assets for growth). The capital expenditure is reported as IRE and the capital income received netted off to give the net IRE. Any nominal or actual betterment not covered by income received is included in the net IRE which is funded through the IRC. The difference in gross and net IRE might also reflect changes timing and accounting of income.

We recommend that NI Water reviews its expenditure on infrastructure and income received to confirm the allocation of expenditure and income in light of this practice.

Line 3 The Company has not identified grants and contributions against infrastructure renewals expenditure. The net expenditure in Line 3 equals the gross expenditure in Line 5.

Line 4 The Company has not identified any grants and contributions against maintenance non-infrastructure for the report year.

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Lines 7 to 8 The main element of the quality enhancement programme are the quality element of the water mains replacement programme and upgrades to treatment works at Carran Hill, Clay Lake and Fofanny.

The additional OPEX relates to works commissioned at Clay lake WTW.

Lines 9 to 10 The allocation of costs to enhanced service level is mainly backlog base maintenance from works carried out under the Operation Capital programme. This reflects the underlying assumption that replacement of any water main on condition grade 4 or 5 would be allocated to backlog base maintenance.

We note that the Company has not allocated costs of mains replacement under the distribution zone programme to backlog base maintenance despite the fact that many of the mains replaced under this programme are in condition grade 4 and 5.

Lines 11 to 17 The expenditure allocated to supply demand balance is a combination of expenditure on hydraulic improvements delivered through the water distribution zone projects and the provision of water mains to connect new development.

No free selective or optant meters have been installed.

No additional OPEX has been identified for growth or new development.

Lines 18 to 19 No new obligations have been identified.

Line 20 Infrastructure Charge Receipts – New Connections

The Company has reported the infrastructure charge receipts for the water service in the report year.

The infrastructure charge for connection of new properties to the water service was set at £250. The charge was subsidised by two thirds in 2007/8, so the actual income received from customers in the report year was £83.33 per property. The balance of the income comes from government subsidy. Both sources of income have been reported.

The total income for this line reconciled with the finance summary data reviewed during the audit.

Line 21 Enhancement Requisitions, Grants and Contributions

The Company has reported two categories of income against enhancement grants and contributions:

- Charges made to customers in respect of services including inspections and approvals for making new connections.

- Income against expenditure in excess of reasonable cost contributions for the provision of local infrastructure for new developments.

This line consists of the sum of charges for physical connections to water mains. Information is provided by the New Connections Team. Actual payments made by customers for connection are flagged by Crystal Alliance on a Receipts Lodgement Document (RLD), which also defines the finance code to which the income should be charged. These are received and checked by Finance and the table line is built up by summing these charges. Customer Services are understood to check payments against the new connections database but this was not audited. The charge varies from £185 for a connection up to 32mm dia, with a rising scale for connections of greater diameter, depending on the water main material. The total number of connections made in 2007/8 was 9077 (7595 household and 1482 non-household). The total income of £2.252m in 2007/8 was reconciled with Finance Dept. summary data.

NI Water carries out water network extensions free of charge to customers up to a defined level, known as the 'Reasonable Cost Contribution' (RCC). The value of the RCC varies for new and existing properties (and for water and sewerage connections) and is £2230 for a new property and £6500 for an existing property.

When a network connection application is made which requires a network extension, the Developer Services Coordination Team (DSCT) assesses the likely number of connections and the work is then costed on the basis of a scheme design and unit rates provided by E&P. The applicant is then required to pay the balance of cost over and above the sum of RCCs. As for line 20 above, Finance is notified of the actual cost paid by the customer and the income is credited to the capital requisitions contributions code. Income is not credited to the project which is required for the making of the connection. NI Water is not believed to make any cross-checks between the numbers of payments and the number of connections made, or between water and sewerage connections, which in most cases should match for a particular development. The total income of £0.251m in 2007/8 was reconciled with Finance Dept. summary data.

Lines 22 – 23 Adopted Assets, Nil Cost Assets

No water assets were adopted in the report year, either at nil cost or in return for a payment.

Block H Expenditure Totals

Line 25 was confirmed as being identical to Table 32, line 25 as required in regulatory guidance.

Line 26 was confirmed as being the sum of Table 32 line 17, column 3 and Table 32, line 33, column 3, after allowance for Table 37, line 9, as required in regulatory guidance.

36.8 Comments on Confidence Grades

The Company has not reported confidence grades for table 35.

37 TABLE 35A – WATER SERVICE - EXPENDITURE BY PURPOSE

37.1 Key Points

The Company has not provided a comparison of OPEX in the year with an SBP baseline.

The Company has reported its allocation of the determination at 2006-07 prices based on an analysis of SBP working papers. We have reviewed these papers and note the following:

- Almost all expenditure on quality, enhanced service level and growth are derived from the Engineering and Procurement managed capital works programme with a small distribution of capitalised salaries and overheads and management and general expenditure.

- The QBEG allocation of this expenditure is the same as that reported for the SBP in the CIM subject to minor adjustments of some projects which include both water and sewerage expenditure.

- The proportion of capitalised overheads distributed across the Engineering and Procurement managed programme is much lower in the "determination" than the current allocation for actual expenditure in the AIR08.

- The allocation of expenditure between infrastructure and non-infrastructure maintenance in the "determination" includes adjustments and corrections of SBP expenditure allocation as used in the SBP financial model.

- The enhanced service level allocation in the SBP included backlog base maintenance. This approach has been adopted for the "determination" as reported in Table 35A and the expenditure allocation reported in Table 35.

The Company has not included the capital contributions estimated at the time of the SBP.

The Company has inflated the "determination" by 1.0507 which it reports as the weighted average COPI factor adopted for the SBP financial model. We recommend that the Utility Regulator advises on the inflation factors to be used for the comparison of actual expenditure with the SBP.

The Company has reported actual expenditure on the water service of £80.389 million compared with £67.155 in the SBP (at 2007/08 prices). The Company notes that the main variation is in supply demand balance and attributes this to major investment in new development which was not captured in the SBP.

A review of the CIM indicates that most of the increase in expenditure can be attributed to increased activity in water distribution mains and trunk mains. In part, this is associated with development and in part on higher than expected activity in water distribution zones. Much of the change in allocation of expenditure between categories is due to revised allocations of distribution zone investment based on specific assessments which replace a generic assessment undertaken for the SBP.

38 TABLE 36 – SEWERAGE SERVICE – EXPENDITURE BY PURPOSE

38.1 Key Points

1. Information on additional Opex is incomplete. For the wastewater service, the only costs included relate to the ten wastewater treatment works commissioned in the report year. Two of the ten sites, Blackskull and Clady, were too small to have separate site-specific operating costs. For these sites operators made an approximate estimate of additional cost by comparing similar sites. No actual additional costs were available from contract details or suppliers or from project option appraisals.

2. There is currently no process in place to routinely capture and report information on changes in Opex costs as a result of Capex. The desirability of such a system, which would enable more accurate reporting for the Annual Information Return, help the budgeting process and inform the realisation of efficiencies has been recognised by NI Water.

3. NI Water has set rules for proportional allocation of capital expenditure which are set out in the Capital Investment Driver Allocation Manual (CIDAM). The rules are consistent with practice elsewhere in the UK water industry and with Ofwat guidance and are reasonable. For projects estimated to cost under £100000 at inception prime cost allocation is used and a single investment driver is allocated. For all projects in the Engineering and Procurement programme over £100000 in cost, proportional driver allocation is used and drivers can be revisited at each project approval stage. We have commented on capital cost allocation against Table 32.

4. We understand that income from infrastructure renewals charge has been netted off infrastructure renewals expenditure and non-infrastructure maintenance expenditure. We believe that it should be reported in Line 18.

5. No costs are shown as new obligations. However two projects – Killen WWTW and Lawrencetown – were missed from the SBP although the need for investment was known at that time. NI Water has referred to these projects in the commentary but not reported expenditure as new obligations.

6. The Company has reported information on assets adopted at nil costs relating to new sewerage. We understand that the reported valuation excludes pumping stations adopted in the year.

38.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of a series of meetings with the Company. During the audit meetings we:

- reviewed the methodology and documentation used by the Company to complete capital allocation;

- reviewed the data sources and assumptions used by the Company in the analysis;

- audited a number of projects to confirm how allocation rules had been applied in practice;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement except as set out in the Company's commentary;
- reviewed the confidence grades ascribed to the reported data by the Company.

38.3 Base and Additional Operating Cost

Base operational expenditure has been calculated by taking total operating expenditure from Table 22 line 21 and deducting the total change in Opex arising from Capex, calculated as described below, to give base Opex.

Information on additional Opex is incomplete. For the wastewater service, the only costs included relate to the ten wastewater treatment works commissioned in the report year. Opex costs for the wastewater treatment works have been estimated by comparing 2006/7 operating costs, adjusted for inflation, with 2007/8 operating costs for the relevant sites. A sample of these sites was reviewed and the figures used reconciled with summary finance data. Two of the sites, Blackskull and Clady, were too small to have operating cost centres. For these sites operators estimated the additional costs of additional power, contractors, chemicals and materials, by reference to similar sites.

Additional Opex costs estimated in this way was distributed by purpose code in the same proportions as the QBEG analysis for the capital project. It was assumed that no additional Opex would arise from Base expenditure additional OPEX was distributed in proportion to the QEG elements of the QBEG analysis.

No information is available on additional Opex arising from other sewerage assets, such as pumping stations. Where no CIDA allocation was available for a project then the SBP QBEG allocation was used. Where no SBP QBEG allocation was available, then judgement was used.

No information is available on additional Opex arising from other wastewater assets, such as pumping stations, although 12 were adopted in the year. The Company recognises the need to collect this information in future years.

There is currently no process in place to routinely capture and report information on changes in operating costs as a result of Capex. The desirability of such a system, which would enable more accurate reporting for the Annual Information Return, help the budgeting process and inform the realisation of efficiencies has been recognised by NI Water.

38.4 Proportional Allocation of Capital Expenditure

NI Water has set rules for proportional allocation of capital expenditure which are set out in the Capital Investment Driver Allocation Manual (CIDAM). The methodology is discussed in detail in our commentary on Table 32.

For projects estimated to cost under £100000 at inception prime cost allocation is used and a single investment driver is allocated. This can be reviewed at the completion of appraisal but

in practice many projects of this value move straight to implementation and drivers are not reviewed as a matter of course. For all projects in the Engineering and Procurement programme over £100000 in cost, proportional driver allocation is used, in line with CIDAM and drivers can be revisited at each project approval stage.

Proportional allocation has been brought into use only in the report year and the Company has yet to complete an analysis of all on-going projects. The estimated total value of projects with no allocation completed is 4% of the programme total and this mainly relates to minor completion expenditure on prior year projects, rather than to new small value projects started in the year.

38.5 Allocation of Quality Compliance and Maintenance Expenditure at WWTWs

When practising proportional allocation for water treatment works, the practice is first to allocate the growth proportion, then the quality proportion and finally any the remainder to base. If particular assets correspond to the meeting of particular drivers then their cost is allocated directly to that driver.

38.6 Assets Adopted at Nil Cost

The Company has included a valuation of assets adopted at nil cost. This relates to sewerage and pumping stations on new developments, constructed by the developers and adopted by the Company.

Information on adoptions is collected by the Infrastructure Development Teams (IDTs) who oversee the adoption process and check that assets meet the required standards before adoption. The data returns are internally checked by IDTs and signed off before summary information was submitted to the Finance Department for the AIR08.

Returns are compiled priced using unit rates. The rates used are SBP rates at 2006/7 prices, updated using RPI

These SBP rates were derived in a consultant study from the cost of work tendered for the Water Service of Northern Ireland. The RPI rates used for this updating were those for March 2007 and February 2008.

The rates are assumed to be for average depth. All pipes are assumed to be in rural/suburban road which we believe to be a conservative assumption for sewers in developments.

The adoption process was reviewed and site details were checked for three sites. For the sample sites the sewer lengths from sewer records were found to correspond to the information returns used for the purpose of this line. In addition, we were able to confirm that the sewers had been added to the corporate GIS.

During our audit we noted two pumping stations adopted in the report year which had not been included in the calculations for Line 20. We understand that 12 sewage pumping stations were adopted NI Water in 2007/8 which were not included in the return.

38.7 Comments by Line

The methodology used for the allocation of capital has been discussed above and in our commentary on Table 32. Further comments on specific lines are given below.

Line 1 The base operating expenditure reconciles to the total OPEX in Table 22 less the additional OPEX due to CAPEX in Table 36. We have commented on the assessment of additional OPEX above.

Line 2 The Company has not identified grants and contributions against infrastructure renewals expenditure. The net expenditure in Line 2 equals the gross expenditure in Line 6.

In similar reports in England & Wales, the grants and contributions against infrastructure renewals expenditure includes the contributions from roads authorities and developers for the diversion of existing infrastructure assets to suit road works and new development (excluding the upsizing of assets for growth). The capital expenditure is reported as IRE and the capital income received netted off to give the net IRE. Any nominal or actual betterment not covered by income received is included in the net IRE which is funded through the IRC. The difference in gross and net IRE might also reflect changes timing and accounting of income.

We recommend that NI Water reviews its expenditure on infrastructure and income received to confirm the allocation of expenditure and income in light of this practice.

Line 3 The Company has not identified grants and contributions against infrastructure renewals expenditure. The net expenditure in Line 3 equals the gross expenditure in Line 5.

Line 4 The Company has not identified any grants and contributions against maintenance non-infrastructure for the report year.

Lines 7 & 8 Total quality expenditure reconciles to Table 38 Line 29.

Expenditure on the quality programme is dominated by expenditure on the Belfast Sewer Project of £40.6 million. The balance of the quality programme is mainly work on sewage treatment works improvements.

Our sample audits indicate that there are errors in cost allocation for sewage treatment projects with too little expenditure allocated to quality and too much allocated to growth. We understand that the Company is reviewing its allocation methodology.

Lines 9 & 10 Expenditure allocated to enhanced level of service is mainly backlog base maintenance on sewers and sewage treatment works. This includes like for like replacement of sewers in structural condition grade 5

Line 11 to 15 The main element of growth expenditure relates to improvements to sewage treatment works. This includes an element of backlog growth.

Part of the allocation of expenditure on sewage treatment works to growth is the result of an error in some allocations where more expenditure should have been allocated to quality.

Sewerage schemes with a major growth allocation include the Belfast Sewer Project.

The new OPEX allocation to growth relates to the additional OPEX associated to sewage treatment upgrades with the OPEX mapped in proportion to the CAPEX QBEG allocation.

Lines 16 to 17 The Company has not reported any costs against new obligations. Two projects – relating to Killen WWTW and Lawrencetown WWTW – were missed from the SBP although the need for investment was known at that time. NI Water has referred to these projects in their commentary but included the expenditure in other lines above.

Line 18 Infrastructure Charge Receipts – New Connections

The Company has reported the infrastructure charge receipts for the water service in the report year.

The infrastructure charge for connection of new properties to the sewerage service was set at £250. The charge was subsidised by two thirds in 2007/8, so the actual income received from customers in the report year was £83.33 per property. The balance of the income comes from government subsidy. Both sources of income have been reported.

The total income for this line reconciled with the finance summary data reviewed during the audit.

Line 19 NI Water carries out network extensions free of charge to customers up to a defined level, known as the 'Reasonable Cost Contribution' (RCC). The value of the RCC varies for new and existing properties (and for water and sewerage connections) and is £2230 for a new property and £4000 for an existing property. Line 19 consists of the sum of sewer extension costs, less the RCC in each case, so it equals the sum of contributions made by customers.

When a sewer connection application is made which requires a sewer extension, the Developer Services Coordination Team (DSCT) assesses the likely number of connections and the work is then costed on the basis of a scheme design and unit rates provided by E&P. The applicant is then required to pay the balance of cost over and above the RCC. As for Table 35, line 20 above, Finance is notified of the actual cost paid by the customer and the income is credited to the capital requisitions contributions code. Income is not credited to the project which is required for the making of the connection. NI Water is not believed to make any cross-checks between the numbers of payments and the number of connections made, or between water and sewerage connections, which in most cases should match for a particular development. The total income of £0.124m in 2007/8 was reconciled with Finance Dept. summary data.

Line 20 Assets adopted or acquired at nil cost is a valuation of sewers adopted by the Company as described in Section 38.6 above. The Company has not reported the value of pumping stations adopted in the year.

Lines 21 to 25 The expenditure totals are the sum of expenditure described above.

Table 36, line 22 was confirmed as being equal to Table 32, line 32, column 6 as required in regulatory guidance.

Table 36, line 23 was confirmed as being equal to the sum of Table 32, line 17, column 6 and Table 32, line 33, column 6, as required in regulatory guidance.

38.8 Comments on Confidence Grades

We recommend a B2 confidence grade for the base OPEX reported in Line 1.

In recognition of possible errors in the allocation of sewage treatment costs, we recommend a confidence grade of C4 for the capital costs in lines 2 to 17.

We recommend a B2 confidence grade for the total capital expenditure in Line 25.

39 TABLE 36A - SEWERAGE SERVICE – EXPENDITURE BY PURPOSE

39.1 Key Points

The Company has not provided a comparison of OPEX in the year with an SBP baseline.

The Company has reported its allocation of the determination at 2006-07 prices based on an analysis of SBP working papers. We have reviewed these papers and note the following:

- Almost all expenditure on quality, enhanced service level and growth are derived from the Engineering and Procurement managed capital works programme with a small distribution of capitalised salaries and overheads and management and general expenditure.
- The QBEG allocation of this expenditure is the same as that reported for the SBP in the CIM subject to minor adjustments of some projects which include both water and sewerage expenditure.
- The proportion of capitalised overheads distributed across the Engineering and Procurement managed programme is much lower in the "determination" than the current allocation for actual expenditure in the AIR08.
- The allocation of expenditure between infrastructure and non-infrastructure maintenance in for the "determination" includes adjustments and corrections of SBP expenditure allocation as used in the SBP financial model.
- The enhanced service level allocation in the SBP included backlog base maintenance. This approach has been adopted for the "determination" as reported in Table 35A and the expenditure allocation reported in Table 35.

The Company has not included the capital contributions estimated at the time of the SBP.

The Company has inflated the "determination" by 1.0507 which it reports as the weighted average COPI factor adopted for the SBP financial model. We recommend that the Utility Regulator advises on the inflation factors to be used for the comparison of actual expenditure with the SBP.

The Company has reported actual expenditure on the sewerage service of £173.896 million compared with £206.083 in the SBP (at 2007/08 prices). The Company notes delays to the sewage treatment programme as a reason for the under-spend.

A major element of the underspend relates to sewage treatment works. The Company attributes this to the delays to the start of some projects pending completion of assessments to determine best value solutions. Based on an analysis of the CIM, this appears to contribute less than half the overall underspend by value. Other areas of underspend relate to the sewerage network, particularly investment following DAPs.

There are material changes in allocation of expenditure between purpose which affects the comparison with the SBP. We have particular concerns regarding the allocation of costs on quality schemes. We believe that there are errors in the application of the methodology which compromise any comparison with the SBP. For example, the change of allocation for the North Coast WwTW EC Compliance project has changed from the SBP as follows:

	Q	B	E	G
QBEG allocation at SBP	44%	28%	0%	28%
QBEG allocation at AIR08	0%	17%	45%	38%

We believe that there is a need to understand and resolve any errors in the allocation before attempting to identify and explain real changes in the direction of expenditure.

40 TABLE 37 – WATER COMPLIANCE – EXPENDITURE REPORT

40.1 Key Points

1. The Company has a methodology for the allocation of expenditure to QBEG drivers. This is used for the allocation of both Capex and Opex costs, except that in the case of Opex. We have described the cost allocation methodology under Table 32.

2. The allocation of drivers to QBEG categories was checked for a sample of five water projects. In each case the currently QBEG allocation different to those assessed for the SBP. In one case these were radically different, not just in the percentage allocations but in terms of whether a particular purpose code was appropriate for the project.

3. The method now used for the allocation of expenditure to QBEG drivers for The expenditure shown for lead communications pipes consists of the entire cost of replacing these pipes. The Company's view is that there is no legal obligation for lead replacement work so it is arguable that no expenditure should be shown against this line.

4. The drinking water programme includes three water treatment works. Carran Hill WTW was completed slightly ahead of the schedule agreed with DWI. Clay Lake WTW is approaching final resolution of minor commissioning issues and is expected to be fully commissioned in line with the agreed date. The contract for Seagahan WTW has been let and completion is expected by the agreed date.

40.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of a series of meetings with the Company. During the audit meetings we:

- reviewed the methodology and documentation used by the Company to complete capital allocation;
- reviewed the data sources and assumptions used by the Company in the analysis;
- audited a number of projects to confirm how allocation rules had been applied in practice;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement except as set out in the Company's commentary;
- reviewed progress on the drinking water programme
- reviewed the confidence grades ascribed to the reported data by the Company.

40.3 Allocation of Expenditure to QBEG Drivers

The method now used by the Company for the allocation of CAPEX expenditure to QBEG drivers is described in detail in our commentary on Table 32.

The QBEG CAPEX allocation is also applied to OPEX costs, except that in the case of Opex, it is assumed that additional Opex cannot arise from Base expenditure. Where additional Opex arises from a project which includes a Base driver, the Base driver is eliminated and the additional Opex is spread proportionally over the remaining drivers. For projects with quality drivers, quality Capex expenditure is further broken down using the CIDA process between the lines in the table. Where a single process delivers more than one quality output there may be an element of subjectivity in the allocation of costs between them. In a few cases no CIDA analysis has been carried out for the project in question. In these cases then the SBP QBEG analysis is used.

We have commented on the allocation of expenditure on water mains in Table 32. The Company has generally allocated costs on the basis of the estimated costs of individual mains. Costs of individual mains are allocated in one of two ways:

- either an individual main is allocated to one of the main purpose codes on the basis of the main driver; or,
- upsizing of the main is allocated to growth on an estimate of the marginal cost of upsizing with the remainder allocated to quality if there is a quality driver or, if there is not other driver, to base.

Following trials a few years ago the Company concluded that mains relining was not a value for money process. The Company states that where work is required on its water mains they are past the point where relining is a useful process and relining is not therefore used. Other similar companies have found that relining is a cost effective process. It is therefore possible that in some cases replacement has been carried out, where only relining would have been required for quality reasons. It is recommended that the Company substantiates its views on the relative economics of relining and replacement.

40.4 Progress on Drinking Water Programme

The drinking water programme includes three water treatment works. Carran Hill WTW was completed slightly ahead of the schedule agreed with DWI. Clay Lake WTW is approaching final resolution of minor commissioning issues and is expected to be fully commissioned in line with the agreed date. The contract for Seagahan WTW has been let and completion is expected by the agreed date.

40.5 Comments By Line

The methodology used for the allocation of capital has been discussed above and in our commentary on Table 32. Further comments on specific lines are given below.

Lines 1 & 2 The Company has not reported any expenditure on the completion of programmes of work funded prior to the SBP.

Additional Opex costs included relate to Clay Lake WTW and Carran Hill WTW, the two water treatment works commissioned in the report year, mainly from investment in previous years.

Lines 3 to 8 The allocation of cost to line 5 (cryptosporidium) relates to Fofanny and Clay Hill.

All other quality work on WTWs is allocated to "other parameters" relating to THM and manganese and iron.

Lines 9-12 Water distribution quality expenditure includes expenditure mains improvements within water distribution zones and trunk mains.

Expenditure is allocated to Line 10 with the exception of £0.168 million allocated to lead communication pipe replacement.

The Company has noted that it does not have a specific legal obligation for lead replacement work. It is arguable that no expenditure should be shown against this line.

Lines 13 to14 E expenditure allocated to security relates to work at water treatment works to prevent vandalism and the contamination of drinking water.

Lines 15 to17 Expenditure allocated to Line 16 relates to health and safety inspections at impounding reservoirs and an option appraisal for a new raw water intake.

40.6 Comments on Confidence Grades

We recommend a B2 confidence grade for the base OPEX reported in Line 1.

In recognition of possible errors in the allocation of costs, we recommend a confidence grade of B4 for the capital costs.

41 TABLE 38 – SEWERAGE COMPLIANCE – EXPENDITURE REPORT

41.1 Key Points

1. The Company has a methodology for the allocation of expenditure to QBEG drivers. This is used for the allocation of both Capex and Opex costs, except that in the case of Opex. We have described the cost allocation methodology under Table 32.

2. The allocation of drivers to QBEG categories was checked for a sample of six wastewater projects. In every case the currently assessed drivers were seen to be different to those assessed for the SBP. In some cases these were radically different, not just in the percentage allocations but in terms of whether a particular purpose code was appropriate for the project.

3. The only additional Opex costs included relate to the ten wastewater treatment works commissioned in the report year.

4. References in Guidance to Reporters to the C5-2 database and Table 20S are taken to refer to EHS quality enhancement weightings, which are the nearest equivalent for NI Water.

5. WWTW completions are in broadly line with the programme for the year. The works have been designed to achieve the consents defined by EHS, but in most cases the QBEG drivers have been reassessed from those assigned at the time of the SBP, at which time the quality enhancement project schedules had not yet been agreed with EHS.

41.2 Audit Approach

Preliminary meetings were held with the Company to obtain a general understanding of the Company's approach and assist in preparing the audit plan. The Company provided a methodology statement for this table which was reviewed.

Our audit consisted of a series of meetings with the Company. During the audit meetings we:

- reviewed the methodology and documentation used by the Company to complete capital allocation;
- reviewed the data sources and assumptions used by the Company in the analysis;
- audited a number of projects to confirm how allocation rules had been applied in practice;
- on a sample basis confirmed that the Company had undertaken the detailed analysis in accordance with the Utility Regulator's reporting requirement except as set out in the Company's commentary;
- compared progress with EHS quality enhancement weightings;
- reviewed progress on the sludge treatment and disposal programme

- reviewed the confidence grades ascribed to the reported data by the Company.

41.3 Allocation of Expenditure to QBEG Drivers

The method now used by the Company for the allocation of CAPEX expenditure to QBEG drivers is described in detail in our commentary on Table 32.

The QBEG CAPEX allocation is also applied to OPEX costs, except that in the case of Opex, it is assumed that additional Opex cannot arise from Base expenditure. Where additional Opex arises from a project which includes a Base driver, the Base driver is eliminated and the additional Opex is spread proportionally over the remaining drivers. For projects with quality drivers, quality Capex expenditure is further broken down using the CIDA process between the lines in the table. Where a single process delivers more than one quality output there may be an element of subjectivity in the allocation of costs between them. In a few cases no CIDA analysis has been carried out for the project in question. In these cases then the SBP QBEG analysis is used.

Allocation of costs on sewerage is allocated on the basis of individual assets. Individual quality items relate mainly to improvements to intermittent discharges. The major element of the intermittent discharge programme is

The allocation of drivers to QBEG categories was checked for a sample of six wastewater projects. In every case the QBEG analysis was different from the SBP and in some cases radically different. We have challenged the Company on these differences. We understand that there may be errors in the allocation methodology which has allocated too little expenditure to quality with the expenditure allocated to growth. The Company is working to assess the impact of this.

41.4 Proportional Allocation of Opex

For the wastewater service, the only costs included relate to the ten wastewater treatment works commissioned in the report year. No costs were included relating to adopted sewage pumping stations. Opex costs for the wastewater treatment works have been estimated by comparing 2006/7 operating costs, adjusted for inflation, with 2007/8 operating costs. Two of the ten sites were too small to have separate site-specific operating costs. For these sites operators made an approximate best estimate of the additional cost likely to arise from additional power, contractors, chemicals and materials, by comparing similar sites.

Costs estimated in this way were spread across the QBEG categories in the same proportions as the QBEG analysis for the capital project, except that it was assumed that no additional Opex would arise from Base expenditure and any Base allocation in the Capex QBEG analysis was spread over the remaining categories in proportion to their Capex values. From audits of sample projects it is clear that QBEG allocations have changed significantly from the SBP allocations and the current allocations are considered more reliable.

41.5 Consistency With Quality Enhancement Weightings

For wastewater quality projects EHS quality enhancement weightings have been used as the basis for allocating costs between individual quality drivers.

Lines 5 –6 Intermittent discharges. For these lines priorities have been agreed with EHS. The quality enhancement weightings did not exist at the time the SBP was drawn up.

Lines 7 – 16 Continuous and intermittent discharges. The allocation of costs to drivers has been carried out for WWTWs on the basis of the quality weightings agreed with the EHS. Expenditure has been allocated in direct proportion to the weightings. For example, a project with a weighting of 2 to driver 'a' and 3 to driver 'b' would have expenditure allocated 40% to 'a' and 60% to 'b'. The quality drivers used (but not the weightings) are shown in the Company's commentary. The quality enhancement project schedules apply only to wastewater treatment.

It is not possible to confirm that only expenditure on quality enhancement schedule projects has been reported in lines 5 – 28, as a number of these projects began before the schedule was agreed. The EHS weightings list covers most quality projects from 2007/8 and onwards. It does not cover all of those projects which began before that time and have SBP finance allocated for later years. The Company has allocated to quality all projects with a new legislative driver, whether listed in the EHS schedule or not, applying judgement to the weightings where these are not defined in the schedule. In our opinion, given that the quality programme began before the definition of the EHS schedule, this is a reasonable approach.

41.6 Works Completed in the Report Year

The Company's commentary lists expected and actual completions in the year. Of 32 programmed completions, 29 were achieved in the year. Three were not achieved by the end of the report year, of which one has now been achieved and two are programmed for completion during the current year. The works have been designed to achieve the consents defined by EHS, but in most cases the QBEG drivers have been reassessed from those assigned at the time of the SBP, at which time the quality enhancement project schedules had not yet been agreed with EHS.

41.7 Properties Served By First-time Sewerage Projects

Numbers of connectable properties have not been assessed for the relevant projects on the same basis as the SBP, as numbers of connectable properties were not assessed for SBP projects.

41.8 Comments By Line

Lines 1 to 4 The Company has not reported any quality expenditure for completion of programmes of works completed prior to the SBP.

Lines 5 to 6 A major element of expenditure reported against intermittent discharge relate to the Belfast Sewer Project.

Lines 7 to 16 The Company has allocated continuous discharge costs between drivers in proportion to the weightings set out by EHS as described above.

We have noted potential errors in the allocation of costs of sewage treatment works between quality which impacts on the costs reported in these tables. We understand that the Company is reviewing these allocations.

Line 17 The Company has identified expenditure against first time sewerage for existing properties connected to the sewerage systems for the first time. We understand that EHS did not set specific quality objectives for first time sewerage in the SBP. In similar reports in England & Wales, the reporting lines refer to sewerage or existing developments which are causing an environmental impact as confirmed by the environmental quality regulator. We recommend that the allocation of expenditure is reviewed to the Utility Regulator to confirm that it is in line with the

41.9 Comments on Confidence Grades

A confidence grade of B3 is reported for all lines in the table.

In recognition of possible errors in the allocation of costs, we recommend a confidence grade of C4 for the capital costs in lines 7 to 16.

42 TABLE 40 – CAPITAL INVESTMENT MONITORING SUBMISSION

42.1 Key Points

1. The company has submitted a completed Capital Investment Monitoring (CIM) spreadsheet for activity to the end of the 2007-08 regulatory year.

2. Expenditure in the CIM is presented at 2006-07 prices. Actual and projected expenditure is deflated to 2006-07 prices using the nominal inflation factors used to develop the SBP.

3. The CIM spreadsheet is limited to expenditure on the "Capital Works Programme" managed by Engineering & Procurement.

4. For the QBEG allocation in Table 40, the company has allocated Backlog Base Maintenance to Base. In the Tables 32 to 36, Backlog Base Maintenance has been allocated to Enhanced Service Level. We understand that the latter approach is consistent with the financial model prepared for the SBP.

42.2 Approach to Audit

During the audit we:

- Met with company staff responsible for populating the CIM spreadsheet to understand the sources of information used and the methodology adopted.
- Reviewed and commented on an initial version of the completed spreadsheet.
- Audited a sample of projects in the CIM in respect of estimated capital expenditure and the QBEG allocation.

42.2.1 Reconciliation with the Annual Information Return – 2007-08 QBEG

We have been able to confirm on a sample basis that the QBEG analysis in the CIM and the QBEG analysis reported in the Tables 32 to 36 draw from the same sources of information. However, there are material differences in the respective reports and it is not possible to reconcile the two sets of reported data. In particular:

- The CIM is limited to the Capital Works Programme whereas the Tables 32 to 36 covers all capital expenditure.
- In the CIM Backlog Base Maintenance is allocated to Base. In the Tables 32 to 36 it is allocated to Enhanced Service Level.
- Tables 32 to 36 are based on a more detailed capital investment driver allocation. This allows for individual projects to be allocated between water and sewerage services and infrastructure and non-infrastructure. The CIM reports primary allocations water /sewerage and infrastructure/non-infrastructure.
- In the CIM, some projects have not been given a QBEG allocation either because the allocation was not complete or was omitted in error.

42.3 Content of the Capital Investment Monitoring Spreadsheet

Col 1 ***CWP Project ID***

This is a project reference from the capital works programme management system Captrax. We understand that the project references are unique and would not be reused in the future.

In most cases, the unique project references used to identify projects during the development of the SBP have been carried forward into Captrax and into the CIM.

Col 2 ***Service area***

This identifies the water or sewerage service. It would be possible for a project to cover both service areas in which case the main service area is reported. The examples reviewed indicate that the value of projects relating to both water and sewerage services is small.

Col 3 ***Primary asset category***

The primary asset category allocates work between the water and sewerage services and infrastructure and non-infrastructure categories. Individual projects might combine infrastructure and non-infrastructure or cover the water and sewerage service. Where this is the case an assessment is made of the primary asset category.

Col 4 ***Primary asset type***

Projects have been allocated by 16 primary asset types which represent the main asset type covered by the project. In many cases the investment covers a single asset type. In other cases an assessment is made of the primary asset type. We note that as a project progresses it may be possible for the primary asset type to change as the project needs are identified and the solution develops.

Col 5 ***Project name***

We understand that project names are taken from Captrax and should not change in future CIM submissions.

Col 44 ***Total Current/Actual Project Costs***

The total current/actual project costs relate to expenditure currently profiled through 2007-10 and 2010-14, including any carry over expenditure beyond the SBP. In some case this will be the latest best estimate for the whole project and, in other cases, the original SBP expenditure profile. For some projects the expenditure profile has been updated for the initial stages of the project but the SBP profiles retained for later which have not been developed in detail.

Col 79 to 114 ***Current Capital Investment Driver Allocation***

The current capital investment driver allocation is based on the detailed project analysis used to populate the Table 32 to 36.

We have commented on the underlying QBEG allocation in our report on Table 32. We noted that:

- The report is based on a capital allocation carried out in September 2007. This reflected the status of projects at that time and does not reflect project information at year end. As a result, in some cases projects with material spend have been allocated to a single purpose code when a multiple allocation would have been appropriate.

- There are material differences in the allocation by purpose at the SBP and the AIR08. In particular:

    - Costs of mains replacement have not been allocated to backlog base maintenance following the methodology set out in the CIDA manual.

    - Possible errors in some sewage treatment works allocations have resulted in a movement in allocation from quality to growth.

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43 TABLE 41 – HEALTH & SAFETY INFORMATION

43.1 Key Points

1. The Company has a health and safety policy which has been revised and updated in the report year following an audit carried out by RoSPA.

2. The Company derives its records of numbers of staff and days lost due to illness, due to sickness and accidents and incidence of occupational ill health from its Human Resources Management System. Days lost are populated from manager's returns and cross checked against payroll records.

3. NI Water keeps only partial records of its contractors' health and safety statistics, but does present, within its Safety Health and Environment (SHE) report, a summary overview of contractors' health and safety performance, on a monthly basis. This report is reviewed by both the Executive Team and NI Water's Board on a monthly basis. The report is also reviewed by NI Water's 'Risk and Reputation' Board sub-committee on a quarterly basis. At the audit, it was reported that the Health and Safety Manual has been re-written, reviewed by RoSPA and awaits formal approval within NI Water.

4. The available data is insufficient to allow population of Blocks C & D of table 41 which relate to contractors' performance.

5. In its draft commentary, NI Water has not defined its 'core operational activity', so it is not possible to review the list for completeness. However, the data does relate to all personnel who are directly employed by NI Water and a departmental listing, contained within the output which was required for data trailing, is given below.

43.2 Commentary on the Company Methodology

Total days lost due to sickness, accident, and occupational ill health were obtained from the HRMS system. Data is uploaded onto the system from managers' monthly returns, and data from the external occupational health adviser. The data is cross-checked with payroll records. The reported figure reconciles with the data. HRMS system data and functionality was not checked at this audit.

The Company has omitted to include the definition of its 'core operational activity' required by the reporting requirements, but a data trail of line 2 showed that the following directorates were included in the data capture:

- Operations Directorate
- Engineering and Procurement Directorate
- Asset Management Directorate
- Finance & Regulation Directorate
- Human Resources Directorate
- Customer Services Directorate

- Business Transformation Directorate
- PPP Unit

As this is the first year of the full Annual Information Return process it is not possible to compare this list for consistency, but it is complete in that it describes the full functions of a water undertaking, with the exception of the customer call centre which is 'out-sourced'. The PPP (Public Private Partnership) unit is small, with just 6 FTE.

43.3 Approach to Audit

To audit this area, a meeting was held with the Head of Health & Safety, and the Head of Human Resources and Organisational Development. Documentary numerical support for line 2 was requested and trailed, but no further data trailing has been carried out. The Company's methodology is appropriate.

43.4 Table 41 - Block A – Lost Time due to Sickness, Accidents and Incidence of Occupational Ill Health

43.5 Commentary on individual line entries including confidence grades

Line 1 The total number of employees was derived from NI Water's Human Resources Management System (HRMS). The figure is a full-year average.

The data comes from a corporate system linked to payroll records. The Company reports a confidence grade of A2 for the data, we believe that it is approaching A1.

Line 2 Total days lost due to sickness, accident, and occupational ill health were obtained from the HRMS system. Data is uploaded onto the system from managers' monthly returns, and data from the external occupational health adviser. The data is cross-checked with payroll records. The reported figure reconciles with the data. HRMS system data and functionality was not checked at this audit.

In its methodology, the Company notes action taken to overcome high levels of days lost due to sickness resulting in a lower level of days lost compared with 2006/07 and compared to the NI Civil Service. The number of days lost remains higher that similar statistics reported for water and sewerage companies in England and Wales.

The confidence grade of A2 is accepted as reasonable.

Line 3 Total days lost – rate per '000 employees is calculated from the preceding figures. The confidence grade of A2 is accepted as reasonable.

Lines 4 & 5 Incidents of occupational ill health are derived from records from the occupational health adviser entered to HRMS. The confidence grade of A2 is accepted as reasonable.

Line 6 Total RIDDOR Incidents is based on formal records auditable by the HSENI. No draft confidence grade was reported but A1 is appropriate.

Line 7 RIDDOR – rate per '000 employees

The draft entry of 8.6 is rounded and numerically incorrect. It should be 8.94.

No draft confidence grade was reported but A1 is appropriate.

Line 8 3-day accident rate per '000 employees

The draft entry for this line is rounded but to 2 decimal places the value is unchanged at 0.60.

No draft confidence grade was reported but A1 is appropriate.

Lines 9 Major/fatal accident rate per 1000 employees

No major accidents have occurred.

No draft confidence grade was reported but A1 is appropriate.

43.6 Table 41 - Blocks C and D – Contractor Statistics

NI Water prepares and presents monthly, to its Executive Team and its Board, a table of 'Contractor Safety Statistics' within its Safety, Health and Environment (SHE) Report. This table gives a monthly and YTD summary of accidents in the categories of 'lost days' and 'minor'. Contractors' data on sickness and occupational ill health is not processed by NI Water. The available data is therefore not sufficient to support table entries in Block C, so no table entries have been made.

As for Block C, the table 'Contractor Safety Statistics' within the Company's 'SHE' report also summarises 'Dangerous Occurrences' and 'Near Misses'. This data is obtained through its HS1 formal accident, and web-based 'near miss', reporting systems. Data from Contractors' RIDDOR records are not specifically requested, so the data for Block D is not available and no table entries in this block have been made.

In its commentary the Company presents summary information obtained from contractors. The Company draws attention to the steps taken in 2007-08 to promote and reinforce health and safety through industry seminars, senior management inspections and the establishment of a new operational control centre. The Company highlights a concern that increasing awareness, improved reporting procedures and

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