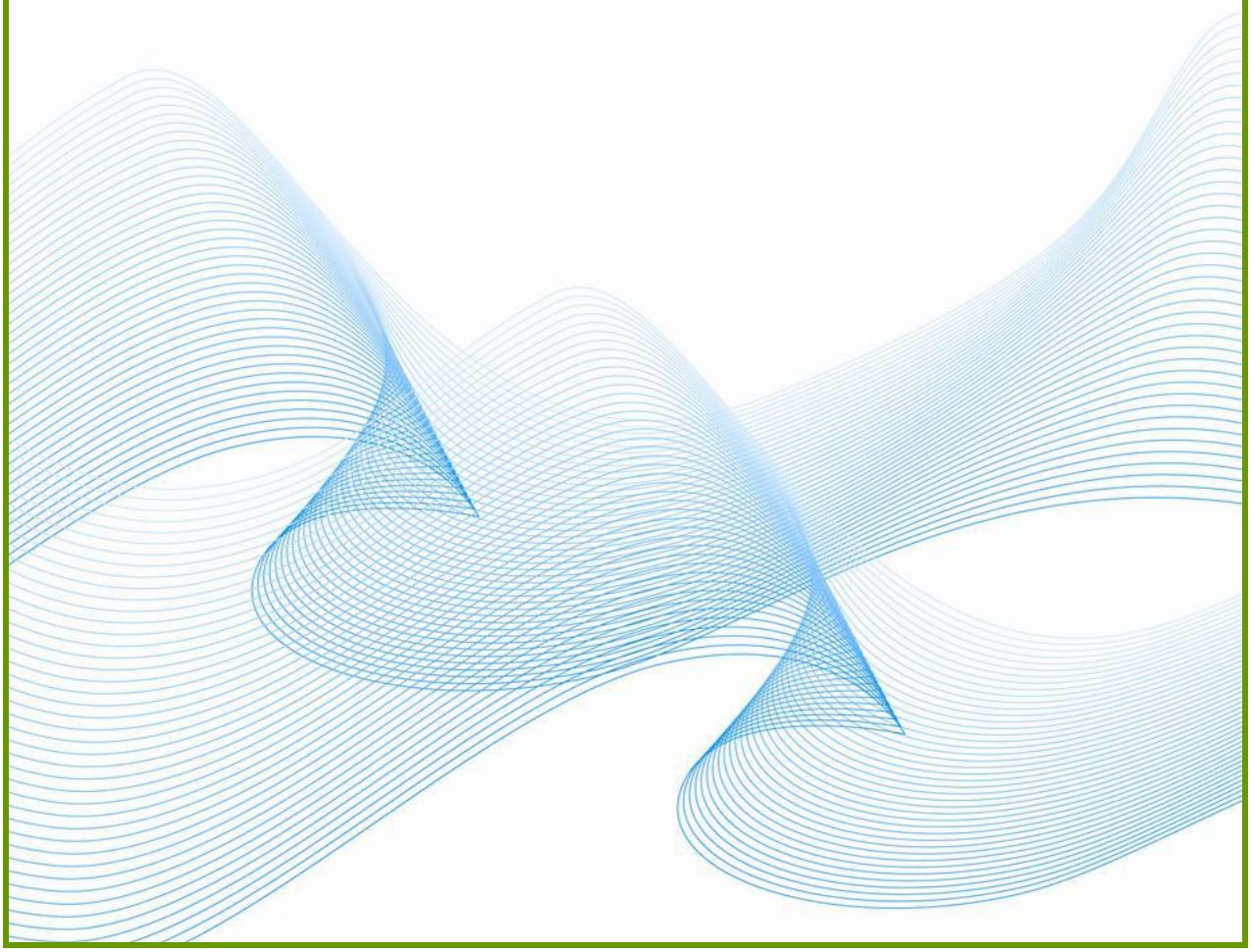
Water and Sewerage Service
Price Control 2010-13

Draft Determination Main Report – Annex D2
Determination of NI Water's Special Factor Claim

September 2009



Water and Sewerage Revenue and Charges Price Control 2010-2013

Draft Determination Main Report

Annex D2 – Determination of NI Water's Special Factor Allowance

Content Note

The determination on special factors has been previously communicated to NI Water in a letter and report sent on the 21st April 2009. This annex reproduces the information produced in that initial report, so has not been reformatted to reflect the style and numbering of the main document. The special factor analysis also contains some confidential data which has been removed for the purpose of this publication.

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Background

1.1. As part of the Price Control process (PC10), Northern Ireland Water was asked to submit an initial special factor claim by the 17th October 2008. A revised claim was required by the end of February 2009 to reflect any changes which might occur as a result of the publication of the Ofwat Relative Efficiency Analysis (REA). Such claims are an inherent part of price reviews carried out by Ofwat in England & Wales and by the Water Commissioner (WICS) in Scotland.

1.2. The purpose of such claims is to determine special circumstances relating to a particular company that materially effect costs in either a positive or negative fashion. It is important to identify and establish these differentials as their impact may well effect the setting of efficiency targets. At present, targets are based on relative efficiency as established by the Ofwat econometric models. Unfortunately the models cannot account for issues which may impact on only one or a small sub-group of companies and are not reflected in the explanatory variables. Were these factors not considered, some companies would appear more inefficient than they really are, leading to unrealistic target setting.

1.3. Special factors differ from atypical expenditure in that they are likely to be recurring in nature. For instance, a company in the South East of England is always likely to have higher regional wages than elsewhere in the UK. This would warrant a recurring special factor claim, assuming the number employed was deemed efficient, as regional wages are partially beyond company management control. In contrast, an atypical cost relates to expenditure that is of an exceptional "one-off" nature e.g. extra maintenance costs as a result of damage to equipment after a storm.

1.4. On the 14th May 2008, NIAUR asked NI Water to consider its' special factors and make representation to the Regulator. NI Water were advised to base their claim on the following four criteria:-

- *What is different about the circumstances that cause materially higher costs*
- *Why do these circumstances lead to higher costs?*
- *What is the net impact of these costs on prices over and above that which would be incurred without these factors? What has been done to manage the additional costs arising from the different circumstances and to limit their impact?*
- *Are there any other different circumstances that reduce NI Water's costs relative to the industry norms? If so, have these been quantified and offset against the upward cost pressures?*

1.5. As part of their initial submission, NI Water identified eight potential claims requiring further work and may be subject to analysis at a future juncture. These included potential claims in relation to water treatment, sludge disposal, chemical costs and lateral drains etc. NI Water also identified and quantified four separate claims

amounting to £24.5m. This consisted of three claims quantifying additional costs incurred by NI Water and one negative scope of adjustment as a result of expenditure not undertaken in Northern Ireland. The constituents of NI Water's initial and revised claim are highlighted below.

Table 1: NI Water special factor claims

Special Factor	Initial Claim (£m)	Revised Claim (£m)
Water Distribution Econometric model	*£14.5m*	*£22m*
Power Costs	*£3.9m*	*£3.9m*
Travel Costs for Wastewater Treatment operations	*0.3m*	*0.3m*
Meter Penetration Scope Adjustment	*-£1.7m*	*-£1.7m*
Total	**£17m**	**£24.5m**

1.6 The purpose of this report is for the Regulator to provide feedback to NI Water on the nature of the claims. This determination shall set out briefly the arguments identified by NI Water for the claim, any counter-arguments as seen by NIAUR and our proposed allowance on the basis of this analysis.

The Regulator's View

2.1. As a matter of course, the Regulator must take a view on each of the claims and decide whether the expenditure should be excluded / included from normal business costs. This will make a difference to any subsequent efficiency analysis as the level of base expenditure will be different if all or some of the claims are accepted.

2.2. Taking the special factor claims in the order given, the Regulator has formed a view of the amount that should be allowed. This is highlighted in the table below.

Table 2: NI Water special factor claim and Utility Regulator's proposed allowance

Special Factor	Value Claimed (£m)	Proposed Allowance (£m)
Water Distribution Econometric model	*£22m*	*£7.22m*
Power Costs	*£3.9m*	*£2.67m*
Travel Costs for Wastewater Treatment operations	*£0.3m*	*£0m*
Meter Penetration Scope Adjustment	*-£1.7m*	*Not Required*
Regional Wage Scope Adjustment	*No Claim*	*-£5.6m*
TOTAL	**£24.5m**	**£4.29m**

2.3. Each special factor claim has been individually analysed in the remaining chapters with associated arguments and calculations. For summary purposes a brief explanation of the findings is included at this stage.

2.4. With regard to the water distribution claim, NIAUR accepts that a special factor exists by virtue of the rurality of Northern Ireland, whilst recognising that other cost drivers are influential. The rural network is not something that can be controlled for easily and is outside the scope of management of NIW. The Regulator is also prepared to acknowledge some of the arguments in relation to extra costs associated with such a network. However, only a proportion of the claim has been recognised as legitimate. This is due to the fact that NIAUR has concerns about the quantification of the special factor, the use of mains length as the primary cost driver and the evidence that

substantial inefficiency exists beyond that claimed by NIW. There is recognition that NI Water is a substantial outlier on the explanatory factor set for England and Wales, leading to concerns that the regression is not reflecting what efficient costs should be in Northern Ireland. NIAUR is cautious about this and has attempted to remove such an influence when deciding upon a special factor level.

2.5. In much a similar vein, there is recognition that electricity costs do differ in Northern Ireland, for many of the reasons suggested by the Company. Consequently, a special factor does exist. The issue again is the quantification of this factor and whether NIW have done everything possible to mitigate this impact. It is the opinion of the Regulator that more could be achieved, hence a reduced allowance.

2.6. With regards to travel costs, the Regulator is not minded to make any special factor allowance. The value claimed falls below the materiality threshold applied by Ofwat and is not considered to be influential in the calculation of efficiency gaps.

2.7. NIAUR accepts the rationale of the negative scope of adjustment associated with metering penetration costs. The adjustment has however been rejected as it is not required for NIAUR's proposed efficiency methodology.

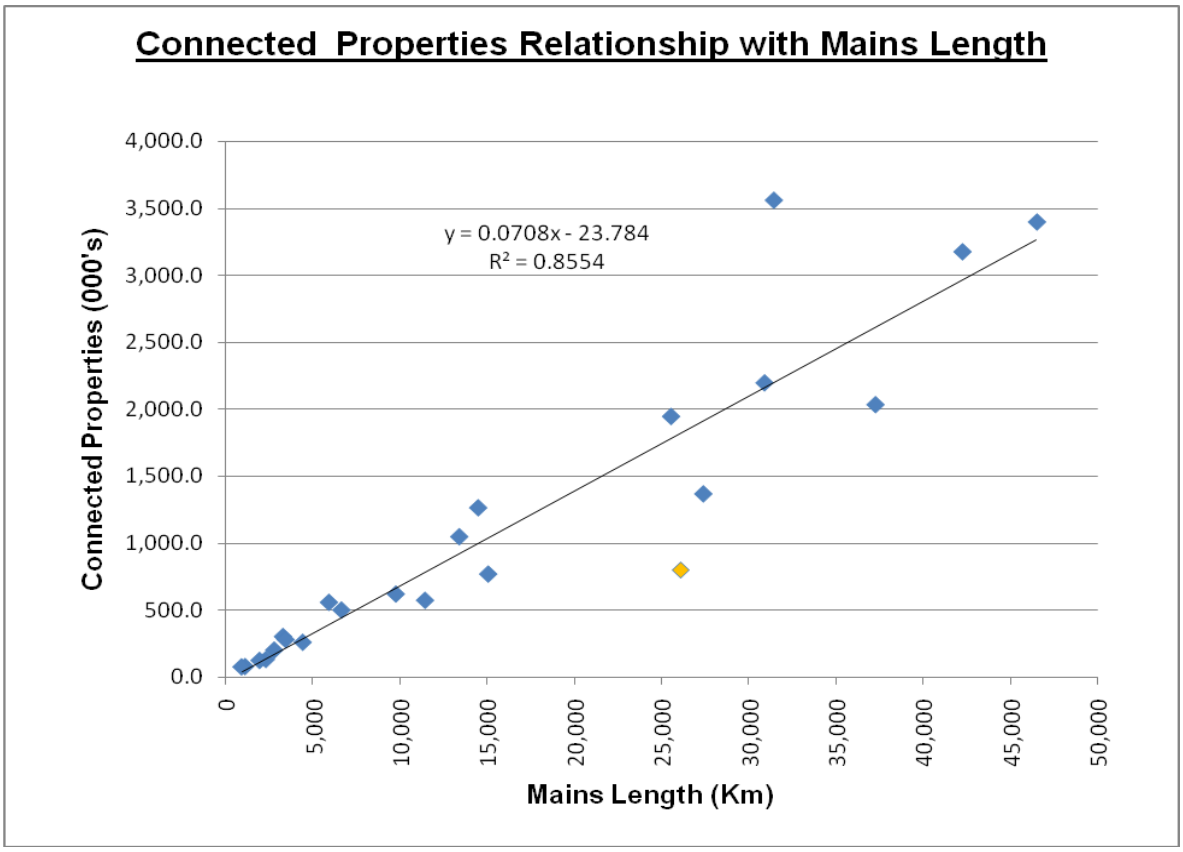
2.8. Following the WICS example, the Regulator has endeavoured to make allowance for negative scope adjustments which it considers material to the analysis. These refer to areas where NIW may have a comparative advantage or do not undertake activities (and hence incur costs) in a comparable fashion to the England and Welsh companies. Although a number of scope differences exist, it has been difficult to accurately quantify all of these in monetary terms. Despite these issues, NIAUR has made an estimation for the comparative advantage NIW enjoys in relation to labour costs as a result of their locality. This estimation has been incorporated into the final analysis.

Water Distribution Econometric Model

3.1. NI Water has made a very significant claim for water distribution costs amounting to some £22m in 2007/08. The basis for the claim is that the econometric model fails to recognise the specific operating environment that exists in Northern Ireland. In 2007-08 the predicted cost is derived from connections and the density of connections as represented by length of main per connected property. NI Water has argued that because the model is scaled by connected properties, it fails to take into account the size of the network. It is therefore claimed that predicted costs are under represented because they reflect connection size and density as opposed to the more appropriate network size.

3.2. In most cases this will not have a serious impact as network size is correlated with connected properties, evidenced by the graph below.

Figure 1: Relationship between mains and connected properties



There are however a few exceptions. From the graph it can be seen that NI Water (in orange) has a very high length of main for the corresponding connections. Using the

line-of-best-fit, such a network in England and Wales would typically serve approximately 1.8m properties instead of the 0.8m currently connected in Northern Ireland. NI Water has demonstrated that as a company they have highest length of mains per head and per connected property in the UK.

Table 3: Water companies mains per connected properties

Rankings	Company	Mains per Connected Property (km/000's)
1	**NI Water**	**32.6**
2	Wessex	20.0
3	Dwr Cymru	20.0
4	South West	19.6
5	Anglian	18.3
6	Cambridge	18.0
7	Mid Kent	17.2
8	Dee Valley	16.1
9	South East Water	15.8
10	Folkstone	14.8
11	Yorkshire	14.1
12	Bournemouth & WH	14.0
13	Severn Trent	13.7
14	Bristol	13.3
15	United Utilities	13.3
16	Northumbrian	13.1
17	Southern	13.0
18	Tendering Hundred	12.5
19	Sutton & East Surrey	12.4
20	Three Valley	11.5
21	Portsmouth	10.9
22	South Staffs	10.7
23	Thames	8.8
24	**E&W Average**	**15.4**

3.3. NI Water has asserted that they are an outlier through no fault of their own but due to various factors including population density, institutional factors and planning considerations. NI Water believe that their high length of main is driving extra costs and making them appear more inefficient in the model than they actually are in reality. This

is due to significant costs associated with longer mains and a large network. NI Water has listed these additional cost drivers, including:-

- Higher levels of chlorine dosing as mains length increases;
- Response and repair costs vary with the size of the network;
- Increased travel related opex;
- Higher contractor costs as more site visits are necessary;
- Extra leakage detection costs as they are harder to discover in rural areas; and,
- More small reservoirs and works resulting in higher opex.

3.4. In an effort to quantify the value of this special factor, NI Water has preferred to adopt a unit cost approach. In essence this entails calculating the distribution cost per length of main for the Company and comparing with the frontier performance (Yorkshire). The relevant performance of each company is highlighted below.

Table 4: Water companies' distribution costs per main

Company	Water Distribution Cost (£m)	Mains Length (Km)	Cost per main (£/Km)
Thames	138.500	31,411	4,409
Three Valley	35.368	14,467	2,445
South Staffs	12.601	5,916	2,130
Portsmouth	6.902	3,278	2,105
Cambridge	4.580	2,305	1,987
NI Water	**45.769**	**26,067**	**1,756**
Sutton & East	5.873	3,435	1,710
Tendering Hundred	1.413	908	1,557
Southern	20.352	13,588	1,498
Bristol	9.666	6,632	1,458
Severn Trent	60.900	46,484	1,310
Northumbrian	32.549	25,519	1,275
Folkstone	1.344	1,110	1,210
Yorkshire	**36.081**	**30,874**	**1,169**
South West	17.295	15,041	1,150
Bournemouth & WH	3.171	2,782	1,140
United Utilities	47.486	42,219	1,125
Mid Kent	4.385	4,415	993

South East Water	9.571	9,751	982
Dee Valley	1.866	1,942	961
Dwr Cymru	23.773	27,364	869
Anglian	22.811	37,232	613
Wessex	6.500	11,423	569
Eng & Wales Ave			**1,479**

From the table it can be seen that NI Water is above the average cost but is much less of an outlier than the Ofwat econometric model would suggest. In order to calculate the level of the special factor, NI Water has used Yorkshire Water cost performance against its own network assets. The argument being that NI Water could be considered efficient if they achieved a cost per main similar to that of the frontier company. By this logic NI Water predicted costs would be £1,169 * 26,067 = £30.5m. The implied special factor is therefore calculated thus:

Table 5: Calculation of special factor (NI Water methodology)

Calculation Line	Opex £m
Current predicted expenditure *(based on Ofwat econometric model)*	£8.5m
Recalculated predicted expenditure (*based on cost per main methodology)*	£30.5m
Implied special factor claim	**£22m**

3.5. From the Utility Regulator's point of view, NI Water has made some valid points concerning this model. The Company has ably demonstrated that it is an outlier in terms of mains length per property. Given that the network size will be determined by outside influences such as planning considerations, the Regulator is willing to accept that some of these costs are unavoidable. NIAUR also recognises the additional cost pressure such a large network will have in terms of chlorine dosing, repair and travel related opex, as argued by NI Water. Added to this is the fact that this Ofwat regression shows NI Water in a much worse light than the other models. If the assumption can be made that a company should show a similar level of efficiency / inefficiency across the models, then the water distribution regression would highlight some special factor allowance.

3.6. There remains however a number of serious concerns relating to both the special factor claimed and the methodology used. In the first instance, NIAUR cannot accept the unit cost model proposed. Using this model means that a companies predicted cost will be equally affected by both large and small mains, whether in a rural or urban location.

Reason and evidence dictates that this is not the case. Indeed, this was not the intention of Ofwat when developing the water distribution model.

3.7. The previous model used the proportion of large mains as a proxy for urbanisation, while the current regression has connection density as the explanatory variable. This evidences the fact that Ofwat consider the highly populated areas to be the major areas of expenditure. It would not be unreasonable to expect that repairs, maintenance and inspection on large urban mains will incur much greater costs than on small mains. In a report by the Competition Commission they note:
"It [Ofwat] told us that the variable (proportion of large mains) was used as a measure of the degree of urbanisation of each company's area. The model thus, in effect, implied that companies with urbanised areas had higher opex. Interpreted in this way, the model can be defended."
The old explanatory variable, much like the connection density, is therefore a proxy for urbanisation. Within these areas the costs of the network as well as additional costs associated with road closures, abnormal working hours etc are much higher. Ofwat consider these urban areas where there are large mains and a high density of connections to be a much bigger influence on costs than simply the length of main. This was also the conclusion reached by the Independent Water Review Panel (IWRP) when considering connected properties per length of main as a specific characteristic of Northern Ireland. They state:
"This [mains length] clearly impacts on costs/capital investment levels as it is much more cost effective to construct a network which will serve the needs of a dense population than of a dispersed population. However, while construction costs will be higher maintenance costs may be lower where the network serves a dispersed population as it is often more costly to undertake maintenance in an urban environment and higher levels of maintenance may be required."[1]

3.8. It is the contention of the Regulator that the proposed alternative unit cost model distorts the results in favour of more rural companies with longer mains. This is the opposite intention of current Ofwat logic. This in effect makes the companies look more efficient than they really are by virtue of their network. NIAUR undertook a reconstruction of the proposed model as well as the Ofwat regression to highlight the existing differences. Compared to the Ofwat model, it can be seen below that the magnitude of the predicted costs depending on the different models used shows significantly variation in many cases.

[1] IWRP Strand One Report, Costs and Funding, Technical Annexes

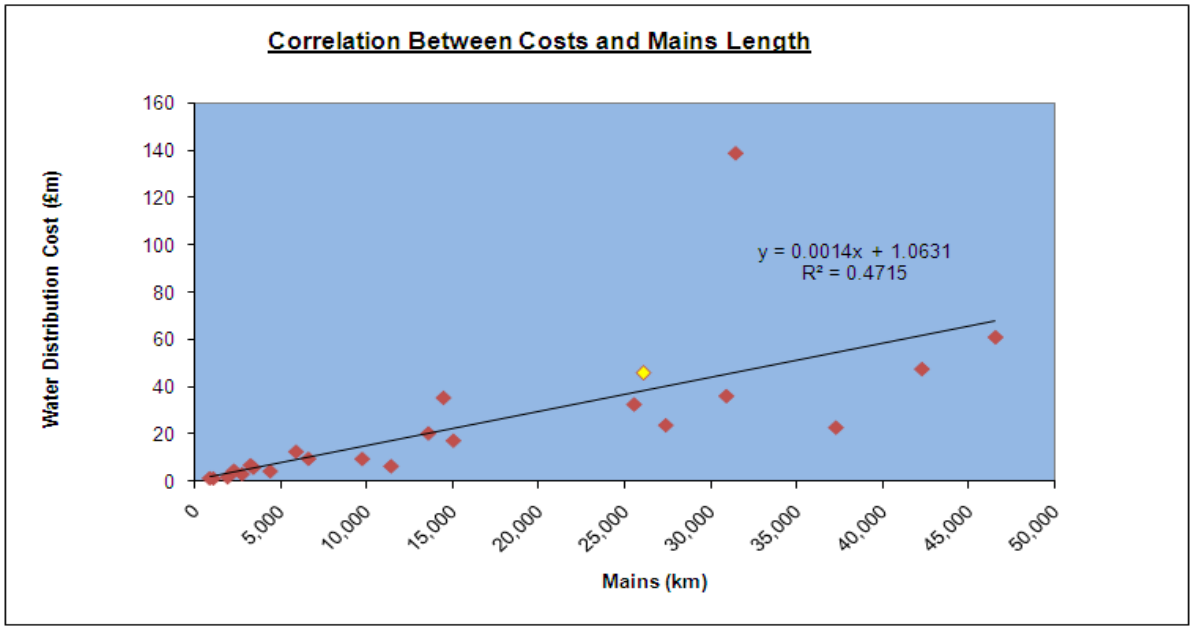
Table 6: Comparison of predicted costs using different alternatives

Company Name	Water Distribution Actual Costs (£m)	Predicted Cost Using Ofwat Model (£m)	Predicted Cost Using NIW Alternative (£m)
Anglian	22.81	32.39	43.51
Dwr Cymru	23.77	20.42	31.98
United Utilities	47.49	63.57	49.36
Northumbrian	32.55	39.30	29.82
Severn Trent	60.90	66.68	54.32
South West	17.30	11.62	17.58
Southern	20.35	21.28	15.88
Thames	138.50	95.53	36.71
Wessex	6.50	8.52	13.35
Yorkshire	36.08	42.25	36.08
Bournemouth	3.17	3.81	3.25
Bristol	9.67	9.95	7.75
Cambridge	4.58	2.06	2.69
Dee Valley	1.87	2.10	2.27
Folkestone	1.34	1.39	1.30
Mid Kent	4.39	4.27	5.16
Portsmouth	6.90	6.88	3.83
South East	9.57	10.91	11.41
South Staffordshire	12.60	13.02	6.91
Sutton and East	5.87	5.81	4.01
Tendering Hundred	1.41	1.51	1.06
Three Valleys	35.37	28.08	16.91
NI Water	45.77	8.45	30.46

The table demonstrates large predicted cost increases for more rural companies with long networks such as Anglian, Welsh Water, Wessex, South West and NI Water. Significant drops in predicted expenditure also exist for highly urbanised companies like Thames and Three Valleys. These results point to the fact that the unit cost per main alternative is not suitable as it conflicts with the logic of the current model. It is moreover potentially misleading in that it allows Band C efficiency companies like Dwr Cymru and South West to appear as highly efficient operators when this is unlikely to be the case.

3.9. NIAUR has other concerns about the selection of length of main as the relevant cost driver. NI Water has justified this selection by demonstrating the relationship or correlation between water distribution costs and mains length (shown below).

Figure 2: Correlation between cost and main length



Although there appears to be some relationship, investigation indicates that other factors have as much if not more of an influence. These include large mains, population, connected properties and distribution input, as demonstrated by the graphs below. It is also true that most of these variables will be closely associated with each other i.e. length of main will be influenced by connected properties which in turn is closely associated with population trends.

Figure 3: Correlation between cost and large mains

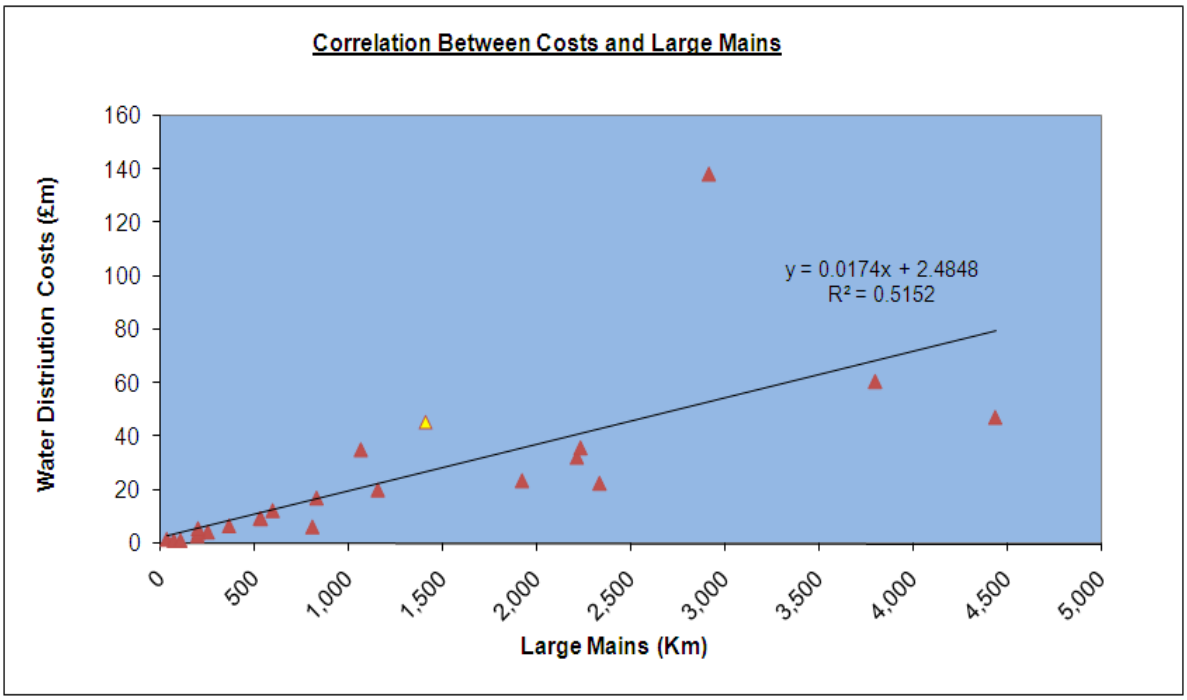


Figure 4: Correlation between cost and connected property

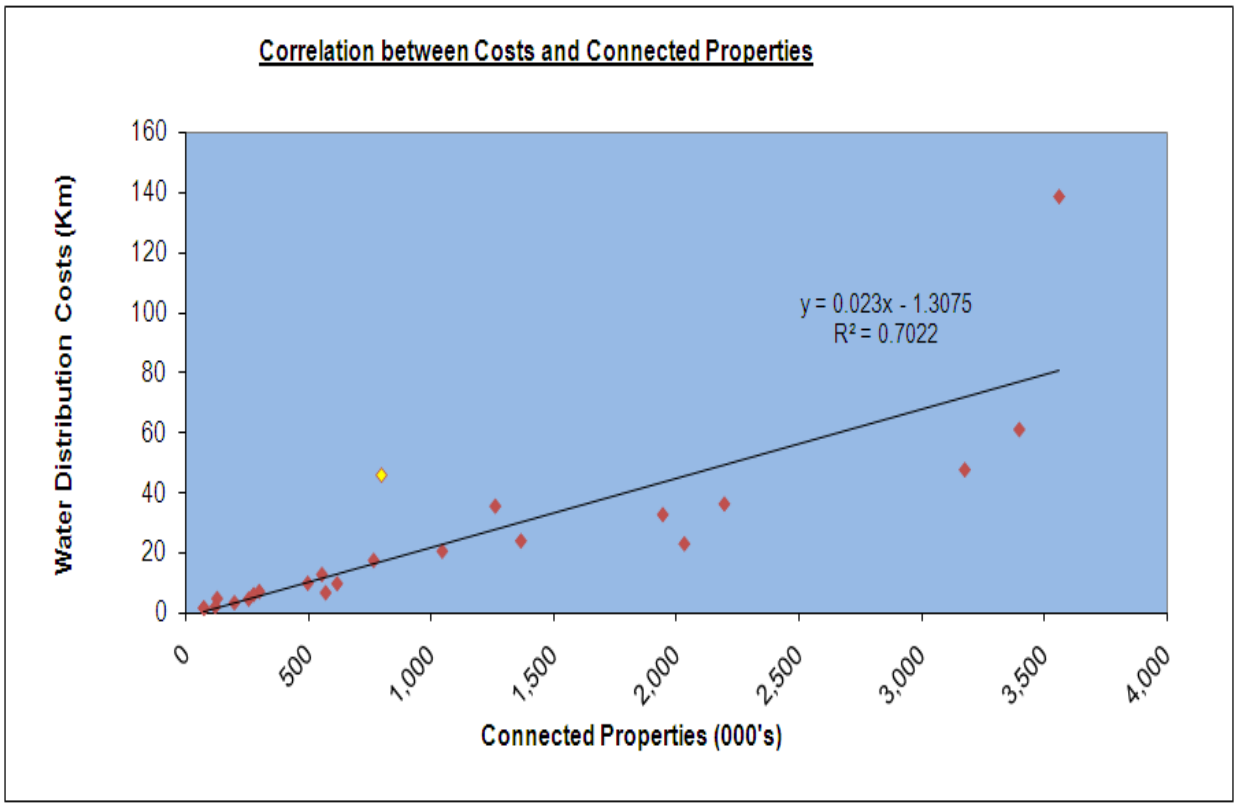


Figure 5: Correlation between cost and population

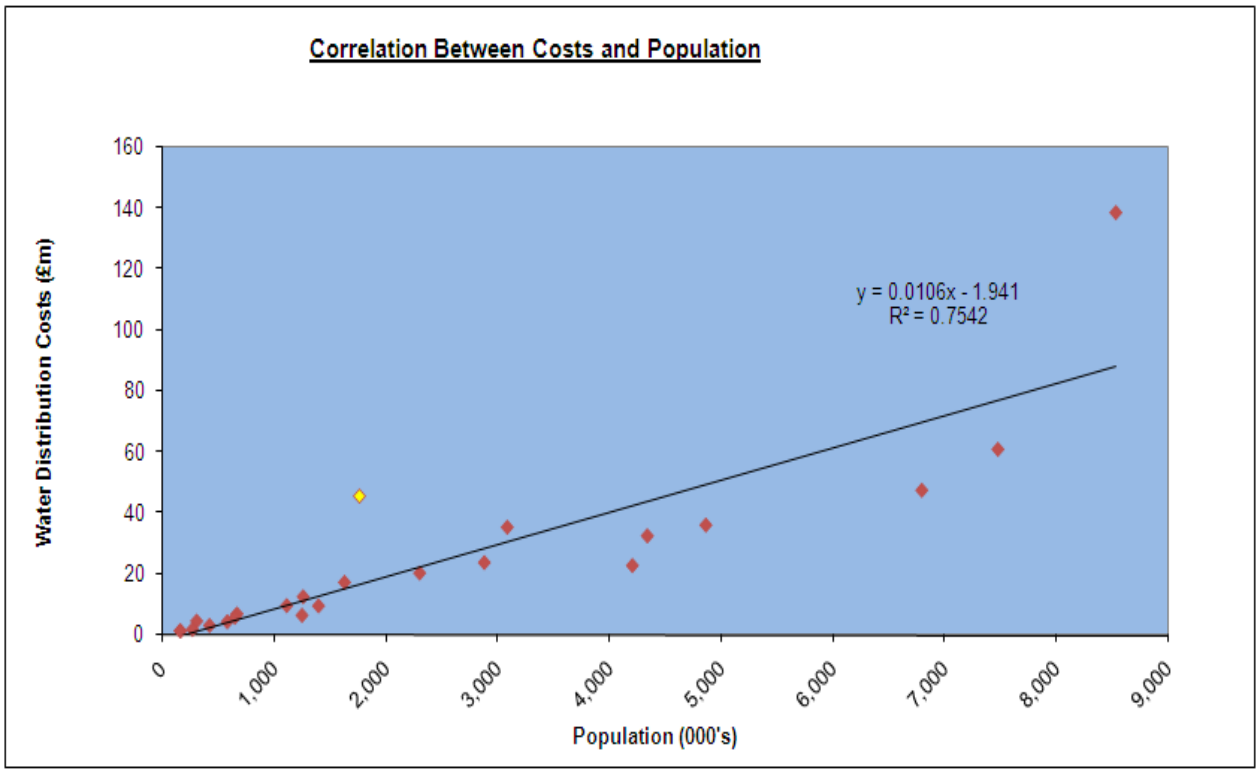
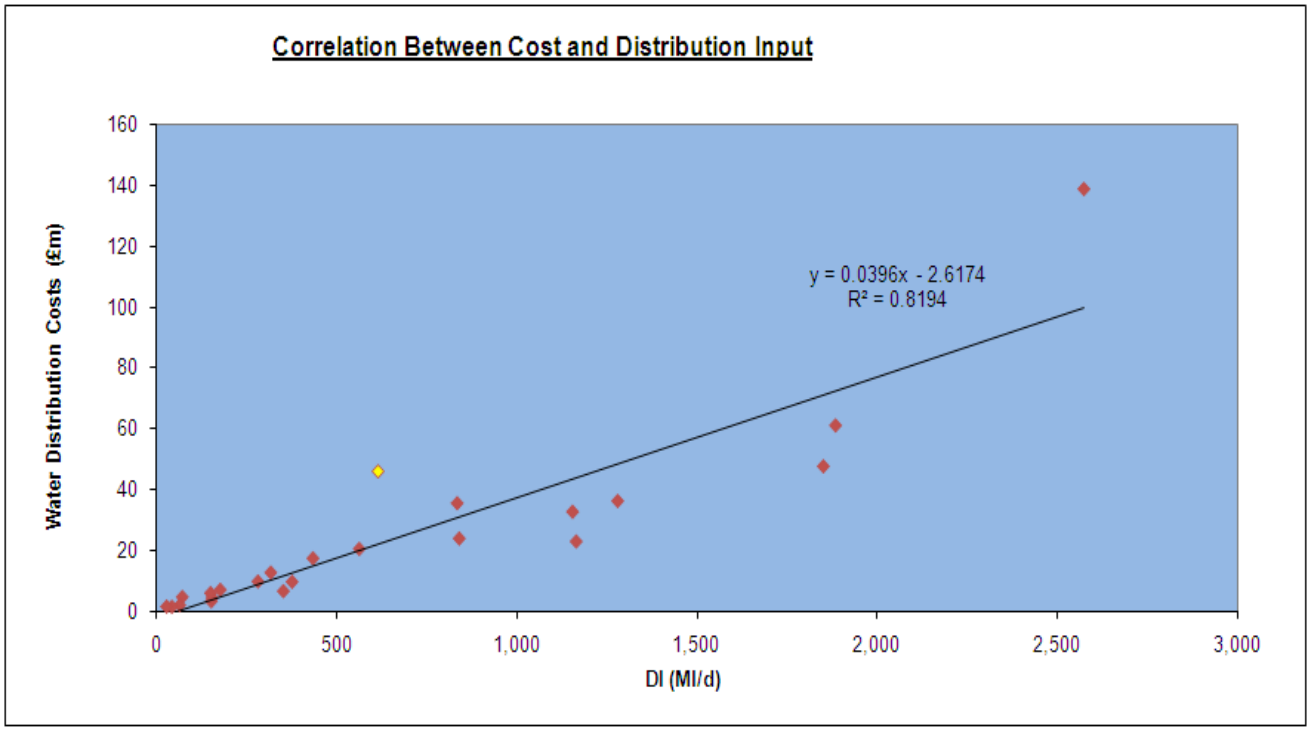


Figure 6: Correlation between cost and distribution input



3.10. The graphs indicate that any of the alternative variables may be more suitable for use in a unit cost model than the simple length of main. The fact that costs will differ substantially depending on the size and the location of the infrastructure does however preclude the use of the unit cost model proposed by NI Water.

3.11. The Regulator has further concerns about the inconsistency of the special factor claim, given the current model. The findings of this regression attribute a negative coefficient to the explanatory variable (mains per connected property). This suggests that longer mains are associated with a lower cost per property. Although this does seem slightly counter-intuitive, it again highlights that densely connected areas are considered to be the main cost driver as opposed to the length of pipe.

3.12. Besides issues with the methodology, NIAUR is also concerned about the scale of the special factor claim. The Regulator accepts some of the arguments NI Water have made concerning additional costs borne by a rural network. However, the Regulator is of the opinion that some of these costs are relatively insignificant. Furthermore, it is the opinion of NIAUR that significant inefficiencies exist beyond even that claimed by NI Water. Statistical evidence exists to prove this assertion.

3.13. Taking the additional costs arguments raised in the special factor claim, the Regulator has formed the following views:

Chlorine Dosing – this was deemed to be a reasonable additional cost. However, it is likely that the impact of this is not material. In 2007/08 NI Water spent £2.3m on materials and consumables for the distribution network, of which, chlorine probably only makes up a proportion. Consequently, any extra costs will be relatively small.

Travel, Response and Repair Costs – the length of the network will obviously have a negative impact on travel and response time, which the Regulator is prepared to accept. The question is whether these additional costs are material or not? NIAUR considers this not to be the case given the relatively small special factor claimed for travel on the sewerage side of the business. Such expenses are also not completely outside of management control. The introduction of Mobile Work Management (MWM) and other measures such as travelling straight to jobs instead of starting from depots should help restrict these costs.

Contractor Expenses – supplementary costs may be experienced by contractors who have travel related expenses associated with the long network. Again however, it is likely that the impact of this will be of little consequence. When tendering for contracts, firms within close proximity will have a comparative advantage and are likely to factor this into their bids. As a result, it is not unreasonable to assume that travel will not have a material affect. There is furthermore an offsetting travel cost effect. WICS made mention of this by stating,

"While dispersion may increase the average length of a journey, it is likely to be associated with a reduction in congestion. A comparatively longer journey in a sparsely populated area may be much quicker than a comparatively short journey in a large urban area."[2]

The Commissioner further reported that where Ofwat had made travel related adjustments, they did so for urban as opposed to rural travel costs.

Leakage Detection – the Regulator is inclined to reject the leakage arguments asserted by the Company. It is the contention of NIAUR that leakage sounding should be easier in rural locations where roads / traffic are less of an issue and background noise will not pose significant problems. Unless the Company can provide additional justification for leakage expenses, this does not appear to be a valid argument. As part of the AIR08 return, NI Water have also stated that pro-active leakage detection costs are being capitalised until the economic level of leakage is reached. Since pro-active detection does not form part of the operational costs, this only leaves reactive maintenance where NI Water face much the same problems as other water companies, regardless of mains length.

Inherited Asset Base – the Regulator accepts the fact that NI Water has more small surface reservoirs and works due to the nature of the network. This may lead to some level of unavoidable cost which would not be experienced by most comparable companies. Whether these costs are significant enough to warrant a material special factor is unclear. NI Water has not provided any information on the associated costs. Furthermore, although WICS did make significant allowances to Scottish Water for geographically related expenditure, they did not make any allowance for reservoirs and water towers. The Commissioner stated that:

"Our analysis found that Scottish Water has not demonstrated that its portfolio of service reservoirs and water towers leads to costs that are not recognised by the models."[3]

NIAUR have the same concerns, although there is recognition that some allowance is deemed reasonable. The Regulator is further aware that NI Water is currently going through a process of rationalisation of its depots and asset base. As a consequence, it is not unreasonable to assume that there is inefficiency within the company and costs have yet to be mitigated fully.

3.14. Besides the methodological concerns and materiality issues, the Regulator is apprehensive that some of the expenditure claimed as a special factor is actually inefficiency. Available evidence supports the contention that expenditure in this area is much more inefficient that even that claimed by NI Water. Analysis of the cost breakdown reveals that NI Water has one of the highest percentages of general and

[2] The Strategic Review of Charges 2006 – 10, The Draft Determination, Volume 6, Chapter 11, WICS
[3] The Strategic Review of Charges 2006 – 10, The Draft Determination, Volume 6, Chapter 11, WICS

support (G&S) costs of all the companies. The Reporter made reference to this fact in his Annual Information Return Report when stating:

"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 and Wales."[4]

Table 7: Analysis of general and support costs

Company	Water Distribution Cost (less power) (£m)	General & Support Costs (£m)	Percentage of G&S Costs (%)
Anglian	22.811	8.11	35.5%
Dwr Cymru	23.773	7.54	31.7%
United Utilities	47.486	21.47	45.2%
Northumbrian	32.549	14.52	44.6%
Severn Trent	60.900	25.90	42.5%
South West	17.295	5.21	30.1%
Southern	20.352	4.44	21.8%
Thames	138.500	65.00	46.9%
Wessex	6.500	2.80	43.1%
Yorkshire	36.081	14.88	41.3%
Bournemouth & WH	3.171	1.01	31.7%
Bristol	9.666	4.02	41.6%
Cambridge	4.580	1.66	36.3%
Dee Valley	1.866	0.86	45.9%
Folkstone	1.344	0.53	39.4%
Mid Kent	4.385	1.54	35.0%
Portsmouth	6.902	3.37	48.8%
South East Water	9.571	5.12	53.5%
South Staffs	12.601	2.91	23.1%
Sutton & East	5.873	1.66	28.3%
Tendering Hundred	1.413	0.76	54.0%
Three Valley	35.368	8.99	25.4%
NIW	**45.769**	**23.48**	**51.3%**

[4] Reporter's Report on NI Water's Annual Information Return 2007-08, Table 21, Block A, P153

Scottish Water	39.617	9.55	24.1%
E&W Ave	**502.987**	**202.291**	**40.2%**

Not only does the table reveal the very high percentage of G&S costs, but it evidences the fact that over 50% of the modelled cost is attributed to this area. This expenditure is largely thought to be centralised costs associated with management and administration, relatively unaffected by the length of the network. Information from the Regulatory Accounting Guidelines (RAG's) reveals the nature of the costs to be included within this category. These include services such as:-

- Administration;
- Personnel;
- Financial;
- Audit;
- General and support buildings;
- Research and development; and,
- Legal etc.

The expenditure attributed to G&S will not be affected by mains length for the most part. This suggests that such high costs have been correctly captured by the current model and reflect significant levels of inefficiency within NI Water. A simple comparison with Scottish Water (a reasonable benchmark) illustrates this fact. In 2007/08 Scottish Water spent 59% less on water distribution G&S than NI Water, despite having a network almost twice the size as Northern Ireland (in terms of pipe length).

3.13. As a method of comparison, the Scottish Water experience is useful for NI Water as they only became a regulated entity fairly recently. Their experience over the last few years illustrates the improvements that are attainable.

Table 8: Scottish Water distribution cost performance (nominal terms)

Scottish Water Distribution Costs - Comparisons in Nominal Terms			
	2003/04 (Km)	**2007/08 (Km)**	**% Change**
Mains	46,508	47,163	1.41%
OWD Costs (less power)	**2003/04 (£m)**	**2007/08 (£m)**	**% Change**
Employment	24.626	21.393	-13.13%
Hired & Contracted	4.415	5.405	22.42%
Materials	2.014	2.149	6.70%
Service charges by SEPA	0.015	0.005	-66.67%
Bulk supply imports	0	0	0.00%
Other direct cost	1.957	1.116	-42.97%
General & support costs	22.799	9.5494	-58.11%
Total	**55.826**	**39.6174**	**-29.03%**

In nominal terms Scottish Water has made highly significant efficiency cuts, despite the slight increase in the length of main. As the table below illustrates, this performance is even more impressive in real terms.

Table 9: Scottish Water distribution cost performance (real terms)

Scottish Water Distribution Costs - Comparisons in Real Terms (07/08 prices)			
	2003/04 (Km)	**2007/08 (Km)**	**% Change**
Mains	46,508	47,163	1.41%
OWD Costs (less power)	**2003/04 (£m)**	**2007/08 (£m)**	**% Change**
Employment	28.147	21.393	-23.99%
Hired & Contracted	5.046	5.405	7.11%
Materials	2.302	2.149	-6.64%
Service charges by SEPA	0.017	0.005	-70.84%
Bulk supply imports	0.000	0.000	0.00%
Other direct cost	2.237	1.116	-50.11%
General & support costs	26.059	9.549	-63.35%
Total	**63.807**	**39.617**	**-37.91%**

Scottish Water has managed to affect major savings across the various cost categories including a 63% reduction in G&S costs, 24% fall in employment as well as a 50% decrease in other direct costs. It could be argued that administration and managerial costs were easier to drive out in Scotland because of the 3-to-1merger. In light of the data table below perhaps this argument may not stack up.

Table 10: Comparison of NI Water and Scottish Water unit costs

Company	Cost per Main (£/km)	Cost per Property (£/property)	Cost per Population (£/person)	Cost per Distribution Input (£'s / MLd)
Scottish Water (03/04)	1,372	25.74	12.93	26,737
NI Water (07/08)	1,756	57.21	25.84	74,488

N.B. Scottish Water costs in 2003/04 (£55.8m) have been uplifted to 2007/08 prices (£63.8m) for purposes of comparability

Even at their highly inefficient position in 2003/04, Scottish Water had much better unit cost performance indicators than NI Water at present. This effectively means that the scope for efficiency improvement is even greater for NI Water, denoting that larger percentage decreases should be achievable. It further illustrates the scale of the challenge being faced by NI Water.

3.14. Inefficiency is not only illustrated by comparison with Scotland but on a UK wide basis. Using cost per mains, NI Water still appears inefficient but does not compare too badly with GB comparators. However, this document has already highlighted the concerns of using this statistic given that it treats both large and small mains the same. This is incorrect and provides a distorted view given the higher costs experienced within urbanised areas. Across the range of other relevant benchmarks, it can be evidenced that NI Water is a significant cost outlier for this particular model. The table below establishes and illustrates this fact.

Table 11: Comparison of water companies unit costs

Company	Cost per Large Main (£/km)	Cost per Property (£/property)	Cost per Population (£/person)	Cost per Distribution Input (£'s / MLd)
Anglian	9,770	11.22	5.42	19,583
Dwr Cymru	12,364	17.40	8.25	28,293
United Utilities	10,701	14.95	6.98	25,676
Northumbrian	14,700	16.73	7.49	28,192
Severn Trent	16,030	17.92	8.13	32,338
South West	20,818	22.57	10.62	39,767
Southern	17,607	19.46	8.84	36,111
Thames	47,500	38.89	16.21	53,849
Wessex	8,042	11.40	5.21	18,429
Yorkshire	16,156	16.43	7.41	28,199
Bouremouth & WH	16,089	16.02	7.58	20,684
Bristol	18,248	19.42	8.71	34,224
Cambridge	18,131	35.81	15.10	63,138
Dee Valley	54,276	15.49	7.03	28,467
Folkstone	18,620	17.94	8.53	30,532
Mid Kent	21,679	17.09	7.60	28,227
Portsmouth	18,884	23.05	10.39	38,710
South East Water	17,896	15.51	6.86	25,381
South Staffs	21,102	22.69	10.02	39,610
Sutton & East Surrey	29,271	21.23	9.09	38,817
Tendering Hundred	13,175	19.49	9.11	48,440
Three Valley	33,178	28.02	11.45	42,378
NI Water	**32,494**	**57.21**	**25.84**	**74,488**
Scottish Water	10,366	15.82	7.96	17,444
GB average (ex. NI Water)	**17,712**	**20.15**	**9.14**	**31,866**

3.15. On each occasion it can be seen that the modelled unit cost is well above the average of other comparator companies. This would suggest that even though the current Ofwat model may not be wholly suitable for predicting NI Water's water distribution expenditure, other comprehensive evidence exists to demonstrate that major improvements are required.

3.16. A question then remains as to what level of special factor would be appropriate. One possible way to gauge this would be to apply other relevant company unit cost performance to NI Water data. For instance, NI Water currently spends £57.21 per connected property on distribution opex. This results in a total spend of over £45m against £8.45m predicted by the Ofwat model. Were they to reduce spending to the GB average of £20.15 per property, this would result in predicted opex of £16.12m and a subsequent special factor of £7.67m (the difference between the new prediction and the Ofwat prediction). In an attempt to gauge a potential special factor, the Regulator has adopted this methodology. Using the previous four unit costs, we have compared NI Water against the GB average, the benchmark company (Yorkshire), Scottish Water and the best performing company for each individual cost.

3.17. Benchmarking against the GB average reveals the following results:

Table 12: Predicted cost required to achieve GB average

Predicted Cost Required to Achieve GB Average			
Unit Cost	**Predicted Cost Using Ofwat Model (£m)**	**Predicted Cost to Achieve GB average (£m)**	**Implied Special Factor (£m)**
Cost per Large Main	8.45	24.95	16.50
Cost per Connected Property	8.45	16.12	7.67
Cost per Population	8.45	16.20	7.75
Cost per Distribution Input	8.45	19.58	11.13

Applying this methodology provides a range from £7.67m - £16.5m. Although a useful comparison, the Regulator would not wish to estimate efficiency gaps based on average performance. Indeed, as part of the Ofwat methodology NI Water is compared against a suitable benchmark to establish an efficiency gap. Discounts and partial catch-up rates are then imposed at a later point. Such a comparison (with a benchmark company) would therefore make more sense for this exercise.

Table 13: Predicted cost required to achieve benchmark performance

Predicted Cost Required to Achieve Benchmark (Yorkshire Water)			
Unit Cost	**Predicted Cost Using Ofwat Model (£m)**	**Predicted Cost to Achieve Benchmark (£m)**	**Implied Special Factor (£m)**
Cost per Large Main	8.45	22.76	14.31
Cost per Connected Property	8.45	13.14	4.69
Cost per Population	8.45	13.13	4.68
Cost per Distribution Input	8.45	17.33	8.88

If NI Water where to achieve the benchmark company performance we find implied special factors that range from £4.7m to £14.3m depending on the unit cost used.

3.18. NIAUR considered that comparison with Scottish Water and the best score of all companies would be a worthwhile exercise. The Scottish example was chosen due to the fact that they were in a similar position to NI Water only a few years ago. The best company score is furthermore important as a reference, being the maximum achievable position in terms of efficiency. The results produce some interesting findings.

Table 14: Predicted cost required to achieve Scottish Water performance

Predicted Cost Required to Achieve Scottish Water Level			
Unit Cost	**Predicted Cost Using Ofwat Model (£m)**	**Predicted Cost to Achieve Scottish Level (£m)**	**Implied Special Factor (£m)**
Cost per Large Main	8.45	14.60	6.15
Cost per Connected Property	8.45	12.66	4.21
Cost per Population	8.45	14.09	5.64
Cost per Distribution Input	8.45	10.72	2.27

Table 15: Predicted cost required to achieve best company performance

Predicted Cost Required to Achieve Best Company Score			
Unit Cost	**Predicted Cost Using Ofwat Model (£m)**	**Predicted Cost to Achieve Best Company (£m)**	**Implied Special Factor (£m)**
Cost per Large Main	8.45	11.33	2.88
Cost per Connected Property	8.45	8.98	0.53
Cost per Population	8.45	9.23	0.79
Cost per Distribution Input	8.45	10.72	2.27

These tables indicate that at the Scottish level and in comparison with the best scores, implied special factors range from £0.5m to £6.2m. The fact that NI Water's predicted costs is below any reasonable unit cost comparator gives a strong indication that some special factor should be considered. In contrast, all other unit cost comparisons (barring NI Water method) indicate that the special factor allowance should be greatly reduced from the £22m proposed by the Company.

Conclusions

3.19. The difficulty faced by the Regulator is in applying an appropriate special factor amount. NIAUR have demonstrated the problems associated with the NI Water proposal, yet accept that some allowance must be made. The Regulator has further demonstrated its opinion that the additional cost arguments asserted by the Company are either relatively immaterial or un-quantified. In contrast, NIAUR is mindful of the similar situation in Scotland where WICS made a significant allowance for geographical factors.

3.20. The Regulator could utilise the aforementioned unit cost approach to determine the allowance. However, this approach suffers from much the same problem as the proposed NI Water method in that they cannot really make a distinction between the high and low cost areas. A cost per distribution input has a certain attractiveness in that it is an indicator based on usage. Caution needs to be exercised though as a company with a high level of leakage will appear more efficient than they really are. Using a cost per distribution input less leakage approach gives the following results.

Table 16: Water companies cost per distribution input less leakage

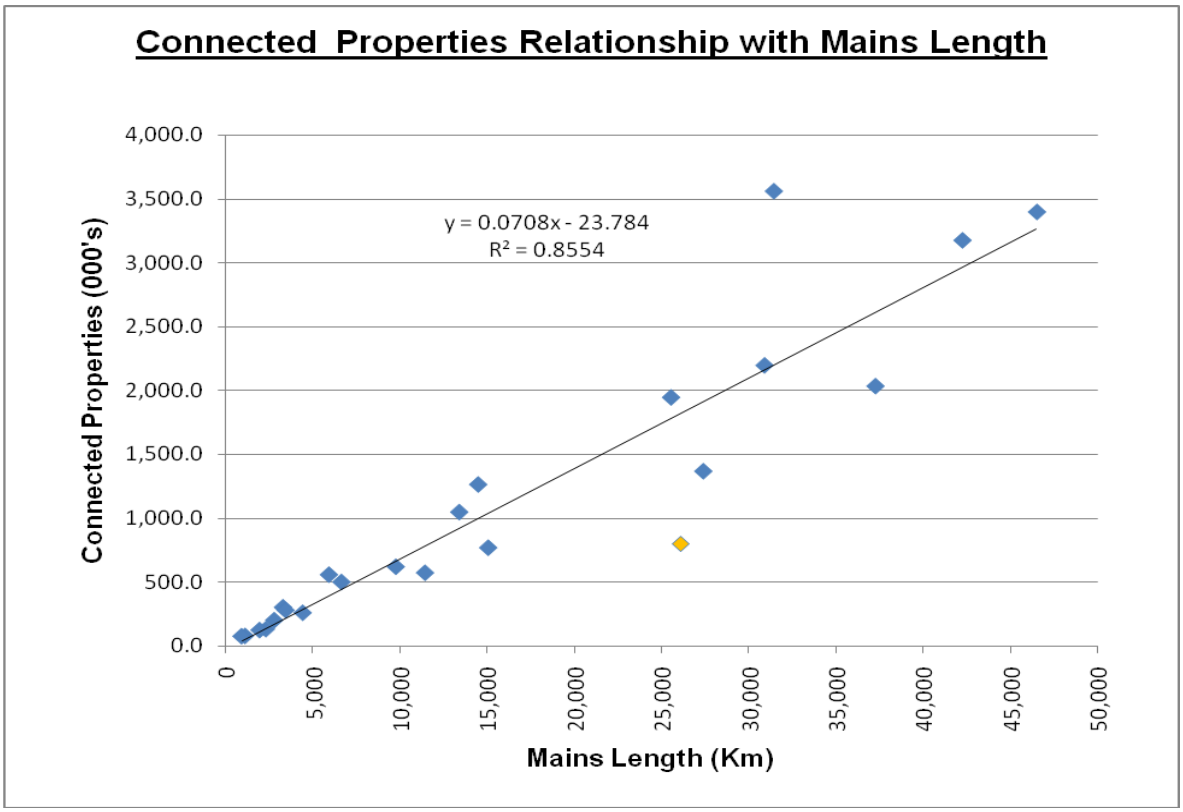
Company	WD Cost (£m) (less power) OWD	Distribution Input less leakage (Ml/d)	Cost per DI less leakage £'s / MLd
Anglian	22.811	956.27	23,854
Dwr Cymru	23.773	636.22	37,366
United Utilities	47.486	1387.22	34,231
Northumbrian	32.549	950.11	34,258
Severn Trent	60.900	1393.11	43,715
South West	17.295	350.68	49,318
Southern	20.352	480.58	42,349
Thames	138.500	1858.77	74,512
Wessex	6.500	280.57	23,167
Yorkshire	36.081	985.90	36,597
Bournemouth & WH	3.171	131.15	24,178
Bristol	9.666	229.57	42,105
Cambridge	4.580	58.65	78,090
Dee Valley	1.866	55.22	33,792
Folkestone	1.344	36.13	37,199
Mid Kent	4.385	128.26	34,188
Portsmouth	6.902	148.68	46,422
South East Water	9.571	308.39	31,035
South Staffs	12.601	246.59	51,101
Sutton & East Surrey	5.873	127.01	46,240
Tendering Hundred	1.413	24.13	58,558
Three Valley	35.368	692.80	51,051
NIW	**45.769**	**457.93**	**99,948**

If NI Water were to apply the benchmark company performance to their own activity, a predicted cost of £16.76m would be calculated, resulting in £8.3m for a special factor.

3.21. Another alternative is to modify the assumptions made about NI Water's network for use in the current Ofwat model. The Regulator considers that the distribution regression is logical but the results are being skewed for NI Water by virtue of a large number of small mains which effectively incur little or no cost. The negative coefficient of the explanatory variable illustrates that additional mains will lower predicted costs. If these mains can be excluded from the analysis a more representative cost can be found.

3.22. One way to allow for this is by estimating what NI Water's mains length would be in England and Wales given the level of connected properties. This figure could then be inputted to the model in order to establish a more realistic predicted cost.

Figure 7: Relationship between mains and connected properties



Using the line-of-best-fit from the graph it is possible to estimate the average X (mains length) given Y (connected properties) which we already know is 800,018 for Northern Ireland. This gives the calculation:-

$$Y = 0.0708(X) - 23.784$$

$$\rightarrow 800.018 = 0.0708\ (X) - 23.784$$

$$\rightarrow 0.0708\ (X) = 776.234$$

$$\rightarrow X = 776.234 / 0.0708 = 10{,}964$$

The figure tells us that an average company would have mains length of 10,964km rather than over 26,000km currently operated by NI Water for this amount of connected properties. If it is assumed that the difference represents small low cost infrastructure, these can be excluded from the regression in order to provide a more realistic predicted

cost. Inputting this assumed pipe length into the model for NI Water results in predicted costs of £15.67m and a special factor of £7.22m

3.23. This special factor value seems reasonable given that it makes a full adjustment for any possible negative influence NIW's very long length of main is having on the model results. It also represents an approximate uplift of £2.5m above that which would be awarded if a cost per population or connected property approach was used. This does not seem to be an unreasonable allowance for the rural network inherited in Northern Ireland, particularly since the modelled cost represents average rather than frontier company performance. As the Company and NIAUR develop a greater understanding of the network and the relevant cost, a more appropriate methodology may be utilised. Until then, the Regulator has determined an allowance of £7.22m for water distribution costs.

Power Costs

4.1. The second special factor claimed by NI Water related to electricity expenditure. Such costs are a significant part of any Water and Sewerage Company (WASC), with minor differentials potentially making a big impact on company performance. As part of their report, NI Water asserted that power costs were materially higher in Northern Ireland compared to English and Welsh operators. This was considered to be outside of management control as more relevant external factors influenced the purchase price. NI Water cites such influences as being:-

1. The lack of competition in the Northern Ireland energy market;
2. A lack of indigenous fossil fuels for power generation;
3. The expensive long-term contracts put in place to facilitate privatisation in 1992;
4. The different market structure; and,
5. The nature of NI Water's inherited asset base (i.e. more numerous smaller sites).

4.2. In order to support this claim, NI Water make reference to two different sources of data. The first is an independent discussion paper produced by the CBI. This highlighted differential rates of electricity cost for a large user in 2007-08.

Table 17: Electricity price differentials by country

Country	Typical price range (p/KWh) for large electricity users in 2007/08
Northern Ireland	
Great Britain	
Germany / Italy	
Spain / France	
Asia (Malaysia / Singapore)	
USA / Canada	

The second comparison was obtained with the courtesy of six companies in England and Wales providing their electricity tariffs. This analysis indicated an average of  for the comparators, roughly near the mid-point of the estimated CBI range for Great Britain.

4.3. In order to quantify the exact amount to be claimed, NI Water applied the differential amount charged per unit to its total electricity usage. This calculation is replicated below:

Table 18: Calculated special factor (NI Water methodology)

	Calculation Line	Figures
A	Total NI Water electricity usage	✂
B	Difference in unit price between average NI Water unit rate and the E&W company average)	✂
C	**Impact of differential on NI Water = A * B**	**£3.94m**

4.4. From the Regulators perspective, NI Water have a valid case for a special factor claim. It has long been known that power costs are out of sync with the rest of Britain. Less competition in the form of supply companies, combined with the high fixed costs of generation due to long term generation contracts and other factors, have led to the adverse differential for Northern Ireland. As a consequence the basis for a claim appears justified. The Regulator also notes that Scottish Water was awarded a partial special factor for power based on the electricity network there and the geographical and demographic influences. The real issue therefore is the quantification of this impact.

4.5. In order to be confident about awarding the correct amount of special factor, the Regulator needs to have confidence in three things:-

- The calculated differential between NI Water and other comparators is reasonable;
- NI Water have undertaken everything reasonably possible to procure electricity at the optimum rate; and,
- NI Water have investigated all avenues in an effort to reduce energy consumption to an efficient level.

Information provided by NI Water on the current differential appears acceptable. The Reporter has noted that the average price per unit (APPU) comparison showed the differential to be in the region of ✂, reasonably consistent with the ✂ (mid-range) gap reported by the CBI. He has further indicated that the comparator companies consists of a reasonable mix of medium-sized organisations with one water only company data. The conclusion that this data is not unduly biased is acceptable to the Regulator. This confirms that the current data sources are reasonable.

4.6. In terms of ensuring procurement efficiency, NI Water has provided evidence illustrating that all contracts are awarded on the back of a robust tender procedure. However it is unclear if NI Water has been able to maximise efficiency. Without access to other companies' confidential data it is very hard to determine this, both for the Regulator and NI Water. On the basis of the limited information provided, the Regulator has some doubts.

4.7. The most obvious concern stems from the fact that NI Water's APPU ( ) is outside the typical range (CBI paper) for a large user ( ) in Northern Ireland. As the largest single consumer of electricity in the country, it does not seem unreasonable to expect that NI Water should not only be within this range, but at the lower end. The fact that the GB benchmarked companies are close to the mid-point of the price range suggests the CBI figures are robust and there is additional scope for NI Water to bear down on costs.

4.8. Furthermore, the data illustrates that there is a slight discrepancy between the gap assumed by the CBI ( ) and that calculated by NI Water ( ). Applying the CBI uplift to the E&W average ( ) calculates a projected expenditure of for NI Water. This would be just within the typical range and may be a more acceptable average level. There is the argument about NI Water having so many small sites to consider. But to some extent, bundling of contracts should help overcome this issue. On the surface it appears that the potential to achieve more savings exists.

4.8. The other big issue with this claim is demonstrating that NI Water have an efficient level of electricity usage. This is important as the price difference has been applied to every unit of electricity used by NI Water. There are some initial concerns that this may not be so. In the first instance electricity consumption has risen by 2.7% in the last year. This does not prove inefficiency but simply highlights increased usage. More pertinent is the comments raised by the Reporter.

"The Reporter notes that several of the initiatives are either future plans or are recently started. This suggests that there is likely to be an element of catch-up efficiency within the quantified special factor claim. This is separate from the issue of comparative unit rates which is the basis of the special factor claim. It suggests that an element of the £3.9m special factor claim represents catch-up efficiency."[5]

From this statement we can ascertain that NI Water is not at the optimum level as mitigation schemes may bear down better on usage and cost as time progresses. Within the additional data provided to NIAUR on the power claim, NI Water have themselves alluded to this fact. On several occasions the Company has mentioned concurrent or future work programmes that should improve energy consumption down

[5] Reporter's Report on NI Water's Special Factor Report 2007/08, Chapter 4, P11

the line. Consequently, it is not unreasonable to only apply the cost differential to a proportion of electricity usage.

4.9. As part of their initial claim, NI Water provided some very useful information concerning proposed mitigation factors such as efficiency audits, process audits, tariff management, energy surveys etc. Unfortunately there was not much by way of quantification of actual examples and costings. As a consequence, the Regulator asked for a further submission detailing some of the required information as listed below.

- A pumping efficiency programme (water and wastewater) - a review of efficiency of current pump sets and pump control;
- Information on water and sewer mains scraping and re-lining (this is predicted by other water companies to save up to 10% of pumping costs);
- Aeration control (Wastewater Treatment Works) – process optimisation (for example control on ammonia and not dissolved oxygen);
- Blower control (Water Treatment Works) - process optimisation; and,
- Evidence of the generation of power (and load shedding) during winter peak times at Water Treatment and Wastewater Treatment Works where plant is available.

4.10 NI Water complied with this request and made further representation on the 18th December 2008. Although this information attempted to quantify some of the savings to-date, it further highlighted the Reporters concern that more efficiency could be achieved. The Company recognise this fact themselves by virtue of statements such as:-

- *"Site visitation and review of existing control systems is planned but like many of the strategy areas it will be in the incoming year 2009/10."*
- *"NI Water energy section is currently working on a project for benchmarking of pumping stations to identify energy intensive sites for energy efficiency action."*
- *"Major implementation of energy survey output work will commence in 2009."*[6]

The Regulator cannot in these circumstances make the full allowance claimed, knowing that further mitigation can be achieved.

4.11. Another factor worth consideration is the impact any special factor allowance will have on the water power econometric model. The special factor claim has not separated out the additional cost by functional area. In order to do so the Regulator has assumed that the claim allocation will mirror the current split of power expenditure i.e. 42% water, 58%

[6] Additional power claim information submitted by NI Water on 18th December 2008

sewerage. This will mean that given the full allowance, a £1.64m special factor would be attributable to water and £2.26m to sewerage expenditure.

4.12. At present the water power model indicates that costs are 25.4% inefficient i.e. NI Water spends 25.4% more than what an average company would. If the total special factor is granted it would have the impact of demonstrating that NI Water is averagely efficient at procuring and using power. This impact is demonstrated in the adjacent table.

Table 19: Impact of full special factor allowance

Impact of Full Special Factor Allowance			
		No Special Factor	Full Special Factor
A	Actual Cost	£9.18m	£9.18
B	Special Factor	£0m	£1.64
C	Modelled Cost (A-B)	£9.18	£7.54
D	Predicted Cost	£7.32m	£7.32
E	Inefficiency (%) (C/D)*100	25.4%	3%
F	Company Ranking (1-23)	23rd	13th

4.13 As the table illustrates, full special factor allowance implies that NI Water would be considered as something approaching an averagely efficient company in terms of water power costs. This may indeed be the case. The Regulator is however of the opinion that such an approach would in fact overstate the efficiency performance of the Company. The reason for this is threefold:

1. NIAUR is not convinced that electricity has been purchased at the optimal rate given that NI Water is outside the CBI range of costs for large users;
2. Both the Reporter and NI Water have highlighted that reduction in electricity usage remains possible as efficiency programmes are implemented; and,
3. The other COLS models demonstrate that NI Water is generally not an averagely efficient performer as yet.

Conclusion

4.14. The evidence from both NI Water and the Reporter is that a special factor does exist. From a contrasting perspective there are strong arguments against a full cost allowance. NIAUR have determined that NI Water could do more in order to mitigate the impact of these power costs. This may consist of either better procurement or reduced usage as the Company becomes more efficient.

4.15. In order to calculate the value of the special factor determination, NIAUR have estimated that NI Water's APPU should be  as opposed to the current  level, if they were

fully mitigating the cost impact. The result is an allowance of £2.67m, as highlighted by the calculation table below.

Table 20: Determination of power special factor

Special Factor Determination		
	Calculation Line	**Figures**
A	Total NI Water electricity usage	
B	Difference in unit price between the proposed NI Water unit rate ( ) and the E&W company average ( )	
C	**Impact of differential on NI Water = A * B**	**£2.67m**

Average pence per unit was chosen for various reasons:-

- NIAUR have little insight into what an efficient level of electricity usage should be;
- NIAUR is not in a position to make an assessment of the impact that efficiency processes is likely to have in the future;
- The represents the mid-point of the ***independent*** CBI figures which NIAUR could reasonably expect an electricity user of the magnitude of NI Water to achieve;
- Although the price uplift chosen ( ) is less than the CBI figures ( ) suggest, the Regulator considers the approach to be equitable. For instance, NIAUR could expect the APPU to be even lower given the CBI figures and NI Water's purchasing power. Furthermore, the determination has applied the uplift to every unit of energy in-spite of the fact that the Company can do more to reduce energy consumption; and,
- As for the other special factors, comparison with the frontier (not the average) is the ideal. Given that any single company figure is unreliable in this volatile market the Regulator has made a determination based on average prices.

As a consequence, the Regulator believes that the reduced allowance represents a reasonable adjustment for the electricity market conditions in Northern Ireland while recognising the fact that the Company has yet to fully mitigate the impact of these costs.

Travel Costs

5.1. NI Water has made a small claim of £0.3m for additional travel costs. The rationale for this claim is similar to the Scottish experience. It is argued that the geographical dispersion of the operational area means more time spent travelling for operatives of NI Water than would be expected elsewhere. Extra costs manifest themselves by way of:-

- Time 'lost' by operatives due to non-productive travelling;
- Cost of excess vehicle repair and maintenance; and,
- Cost for excess fuel.

Comparative information has proven difficult to come by so NI Water has used its own experience as a proxy for average English and Welsh areas.

5.2. The Regulator recognises that the travel time assumptions are reasonable, as confirmed by the Reporter. NIAUR acknowledges that selection of the reference areas is subjective. However, NI Water has failed to provide any evidence to suggest that the three chosen areas (Banbridge, Coleraine and Derry) are in any way representative of an average mainland company. This is a weakness in the analysis.

5.3. The Regulator is anxious about the use of £22.70 per hour as the average labour rate. Scottish Water used a figure of £17.31 (2007/08 prices) and gave a comprehensive breakdown of the 7 different types of operative included in this calculation (e.g. team leader, tank driver, wastewater operative, etc). NIAUR would expect more information on the calculations behind this figure. The differential in wages would also suggest that some of the claim could be reasonably disallowed.

Conclusion

5.4. In spite of these issues, the Regulator has decided to reject this claim in its entirety. The value of the special factor is low enough to fall below the 1% materiality threshold imposed by Ofwat. In it's guidance to E&W companies Ofwat stated:

"We will not be considering claims that have a net financial impact of less than 1% of 2007-08 total service modelled opex. We consider that these small claims are not material to price limits and will not have a significant impact on your relative efficiency assessment."

NIAUR consider this a reasonable approach to small claims. As the value of the claim represents approximately only 0.4% of modelled service opex, with a proposed allowance likely to be even lower, the Regulator has discounted this claim.

Metering Scope Adjustment

6.1. Besides special factors, it is important to identify scope adjustments where costs are not borne by one company but represent the industry norm. In much the same way as unidentified special factors will make a company look more inefficient than they really are, scope adjustments will artificially improve performance if not recognised. One such modification that exists in Northern Ireland relates to metering penetration. A differential exists by virtue of the fact that domestic customer charging has been postponed and fewer non-households are billed based on meter reading in Northern Ireland. NI Water have helpfully identified and quantified this issue within the special factor report.

6.2. The basis for this claim consists upon NI Water estimating the potential costs it might incur if it had a level of metering penetration based on the median Ofwat comparator. NI Water has rejected the idea of a negative adjustment for non-households by virtue of the fact that the metering gap is less extensive at present. Furthermore, NI Water considers that this gap will be largely non-existent in the near future as non-domestic metering schemes are rolled out.

6.3. In order to quantify the impact of the adjustment, NI Water have forecasted metering levels in England and Wales for 2007/08. They are of the opinion that 34% of domestics will be billed for water based on meter readings and 30% billed for sewerage in 2007/08. Using information provided by Ofwat in RD02/04, NI Water have then calculated an operational cost of £4.31 per household. This expenditure relates to costs resulting from reading, billing and account management. Applying the cost per meter to the same E&W proportions of customers in Northern Ireland, a figure of £1.7m is calculated.

6.4. The Regulator accepts the rationale for this adjustment and welcomes the information provided. Given that such an adjustment will add theoretical costs to a company, it is import to err on the side of caution. However there are some concerns with the methodology which have been challenged by the Reporter. The issues he raised include:

1. *The linear forecast trends used by NI Water may underestimate the exponential trend by about 5%;*
2. *The assumption that metering levels of non-households will be similar to that in E&W in future is not a valid argument for not applying a scope adjustment in 2007/08;*
3. *The adjustment has made no allowance for bad debt, which is a significant contributor to costs in E&W;*
4. *The information used for estimation of metering operational costs is rather dated. More up-to-date data may be sourced from the annual Principal Statement; and,*

5. *Assuming parity in Northern Ireland for operational costs appears to be a poor assumption.*[7]

6.5. The Regulator shares some of the concerns voiced by the Reporter. It has also been noted that NI Water has compared themselves against the median as opposed to the more appropriate benchmark comparison. Given these factors, there are strong arguments for an increased scope adjustment. However, the Regulator would wish to exercise caution when adding theoretical costs to the business. Consequently the £4.31 value is considered acceptable, as are the estimated E&W percentages.

6.6. The real failing of this adjustment is the lack of consideration for bad debt. Since no domestic billing has taken place in Northern Ireland, this is not yet a concern. It is unfortunately a major issue throughout the rest of the UK water industry. Were the claim to take account of this problem, the scope adjustment would increase significantly. In the event no such modification is required.

Conclusion

6.7. The Regulator has long been aware of issues concerning the business activity models in the econometric analysis. Across most other parts of the business NI Water compared unfavourably with England and Wales. For water and sewerage business activities NI Water is ranked as a highly efficient performer. It is the opinion of NIAUR that this is an anomalous result. The model is spurious due to the fact that:

- No domestic charging currently takes place (resulting in small costs);
- No account has been made for different levels of metering penetration; and,
- NI Water do not have any real bad debt issues in comparison with other companies.

6.8. During the last efficiency review it was the opinion of the Regulator that such models should be excluded from the analysis. Any efficiency percentages were then calculated from the remaining actual and predicted costs, and then applied to the whole business. Going forward, the Regulator feels this is an appropriate methodology, at least until domestic charging becomes a reality. As a consequence there is no requirement for a scope adjustment for metering or bad debt.

[7] Reporter's Report on NI Water's Special Factor Report 2007/08, Chapter 6

Scope Adjustments

7.1. Following on from the WICS approach to assessing efficiency gaps, and our own guidance on special factors, the Regulator has endeavoured to investigate pertinent negative scope adjustments. Such adjustments reflect costs which are not incurred in Northern Ireland by virtue of comparative advantage or differing service levels, but are normal operating expenses elsewhere. Not taking account of these factors will give an unrealistic representation of the efficiency of a company as the overall level of service must be considered rather than the simple cost.

7.2. When considering such adjustments the Regulator is mindful that caution must be exercised when ascribing costs to a company that it has not actually incurred. That said, there are a number of areas where the situation for NI Water differs materially and warrants further investigation. The Reporter identified such factors as:

1. Customer bad debt – The provision of revenue through subsidy rather than customer charging results in a lower level of doubtful and bad debt than companies in England and Wales;
2. Regional Salaries;
3. Abstraction Charges;
4. Discharge consent charges;
5. Billings / Complaints; and,
6. Leakage.

The Regulator further considered that levels of service as reflected by the Overall Performance Assessment (OPA) would also merit some assessment.

7.3. After examination, NIAUR will not make any scope adjustments for the majority of the factors, with the exception of regional wages. The reasoning is provided in the table below:

Table 21: Scope adjustment decisions and reasoning

Factor	Decision on Scope Adjustment	Reasoning
Bad debt	No change	Like metering penetration, the Regulator considers it more robust to exclude the business activity models from the analysis rather than make difficult assessments of hypothetical costs for bad debt
Regional wages	Change	NIAUR proposes to make an allowance for regional wages given that there is suitable information available on current spend, the regional salary variations and the fact that the

		difference is likely to be material[8]
Abstraction charges	No change	It is acknowledged that these charges will soon come into effect for NI Water. NIAUR has adopted a generous approach in that the efficiency impact of these charges has been ignored for 2007-08
Consent charges	No change	It is acknowledged that these charges will soon come into effect for NI Water. NIAUR has adopted a generous approach in that the efficiency impact of these charges has been ignored for 2007-08
Billings / Complaints	No change	Normally such costs would be included in the business activity regressions. Since these have been excluded from the efficiency analysis, no change is required
Leakage	No change	There is a recognition that leakage is higher per property than in England and Wales yet lower by length of mains (2006/07 data). NIAUR is of the opinion that no adjustments are required since much of these costs are capitalised, while the remaining operational cost is mostly focused on reactive maintenance
OPA	No change	The Regulator believes there is strong case to be made for a level of service adjustment. The argument is that if the comparator companies were to provide the same service performance as NI Water, they would be able to reduce their operational costs considerably. The fact that the OPA differential is large in 2007/08 further reflects the belief that any adjustment may be relatively significant. The difficulty with such an adjustment is that it is very hard to put a reasonable value on the cost of improving OPA scores. Since service levels cover many different aspects of the business, some improvements can be achieved with little or no cost (e.g. customer

[8] Labour cost differential was one of the NI specific factors identified by the IWRP.
Source: IWRP Strand One Report, Technical Annexes, p54.

		services). Others will require significant capital as well as operational expenditure investment (e.g. Drinking water quality, sewerage compliance etc). In the event, the Regulator has decided not to pursue a scope adjustment at this time, due to the foreseen difficulties. NIAUR are however keen to reflect that a service level gap exists and this is having a material impact on the efficiency performance of NI Water.

7.4. After rejecting the other differences, the only scope adjustment remaining is the regional wage modification. The Regulator considered this to be important for four reasons:

- NI Water has a comparative advantage in relation to employment cost by virtue of their location, which should be adjusted for;
- This advantage is likely to be of a material nature;
- Robust data is available in order to make such an alteration; and,
- Ofwat have granted special factors for companies who are above the average.

Regional variation has also been cited for positive and negative special factors on the capital efficiency analysis, giving more assurance that the current approach is reasonable.

7.5. In order to estimate the materiality of this claim, NIAUR developed various options based around the data supplied by the Annual Survey of Hours and Earnings 2008 (ASHE). This data indicated that median full-time weekly wages in the UK (£478.6) is 14.6% higher than comparable wages in Northern Ireland (£417.6). Further analysis reveals that this is only part of the story. Split by occupation the variances are as follows.

Table 22: Gross weekly earnings comparisons by occupation

Gross Weekly Earnings by Occupation (2008) UK vs NI.[9]			
Description	**No. of jobs (thousand)**	**Median (£)**	**Mean (£)**
Managers and senior officials (UK)	3,548	693.0	852.7
Managers and senior officials (NI)	69	554.8	653.4
Professional occupations (UK)	2,688	680.8	768.9
Professional occupations (NI)	78	660.1	686.0
Associate professional and technical occupations (UK)	3,017	539.7	593.5
Associate professional and technical occupations (NI)	85	545.3	575.0
Administrative and secretarial occupations (UK)	2,143	359.0	397.7
Administrative and secretarial occupations (NI)	61	322.2	348.5
Skilled trades occupations (UK)	1,732	451.4	482.4
Skilled trades occupations (NI)	54	399.4	438.1
Personal service occupations (UK)	1,055	316.0	340.9
Personal service occupations (NI)	31	296.1	321.8
Sales and customer service occupations (UK)	805	286.5	315.5
Sales and customer service occupations (NI)	20	253.8	298.7
Process, plant and machine operatives (UK)	1,465	414.6	446.3
Process, plant and machine operatives (NI)	60	359.9	382.6
Elementary occupations (UK)	1,708	317.9	346.3
Elementary occupations (NI)	48	305.5	324.3

Split by industry the findings show significant differences for some sectors yet convergence for others. Of particular interest is the finding that median wages for utility workers (i.e. Electricity, gas and water) are only 1.1% higher in the UK.

[9] Source: ASHE 2008, Office of National Statistics and ASHE (NI) 2008, Department of Enterprise Trade and In

Table 23: Gross weekly earnings comparisons by industry

Gross Weekly Earnings by Industry (2008) UK vs NI.			
Description	**No. of jobs (thousand)**	**Median (£)**	**Mean (£)**
Mining and quarrying (UK)	51	647.8	802.9
Mining and quarrying (NI)	x	369.7	419.7
Manufacturing (UK)	2,709	487.2	562.7
Manufacturing (NI)	88	411.7	464.7
Electricity, gas and water supply (UK)	147	612.6	696.6
Electricity, gas and water supply (NI)	6	605.8	632.2
Construction (UK)	965	515.8	592.9
Construction (NI)	32	400.0	465.1
Wholesale and retail trade (UK)	2,433	380.0	482.2
Wholesale and retail trade (NI)	68	341.1	414.8
Hotels and restaurants (UK)	538	297.0	375.9
Hotels and restaurants (NI)	14	267.7	309.3
Transport, storage and communication (UK)	1,204	488.7	567.6
Transport, storage and communication (NI)	20	402.1	479.5
Public administration and defence, compulsory social security (UK)	1,142	535.1	583.4
Public administration and defence, compulsory social security (NI)	54	556.3	582.0
Private households and employed persons (UK)	12	368.8	401.4
Private households and employed persons (NI)	x	274.6	292.0

7.6. In 2007/08 NI Water allocated some £62m to wages and salaries within their nominal ledger. From this value the Regulator excluded the costs of Voluntary Early Retirement (VER) provision and payments, leaving expenditure of £57.7m. This figure formed the basis of the calculations of a negative adjustment. Using the national statistics available, the Regulator formulated a number of possible options. These alternatives consisted of the following:

7.7. **Option 1: Industry Wages** – Taking the closeness of the utility industry wages into consideration, a 1.1% uplift was applied to all expenditure, in order to estimate the potential employment cost a comparator company might experience. The calculation is evidenced below.

Table 24: Option 1 scope adjustment calculation

Option 1 – Industry Wages		
A	NI Water Employment Cost	£57.7m
B	Uplift Factor (Industry Wage Differential)	1.1%
C	Comparator Company Cost (A*B) + A	£58.3
D	Scope Adjustment (C-A)	£0.63m

This option allows for a £0.63m adjustment but is considered to be very conservative given that not every employee will be specific to the industry. For instance, NI Water will have many managers, accountants, economists, administration workers etc where the comparative wage differential will be much greater than that of the utility sector.

7.8. **Option 2: SOC Wages** – To try and reflect the fact that wages will differ by profession, the Regulator attempted to split the workforce by standard occupational classification (SOC).[10] A weighted percentage uplift was then calculated as a result of these splits and the differences in UK and NI occupational wages. Calculation of this weighted percentage uplift is provided in the adjacent table.

Table 25: Calculation of weighted percentage uplift

Calculation of Weighted Percentage			
SOC	**% of NIW Workforce (A)**	**% Uplift to UK (B)**	**Weighted Percentage (A*B)**
Managers & Senior Officials		24.9%	
Professional Occupations		3.1%	
Associate Professional & Technical		-1.0%	
Admin and Secretarial		11.4%	
Skilled Trades		13.0%	
Personal Service Occupations		6.7%	
Sales and Customer Service		12.9%	
Process, Plant & Machine Operatives		15.2%	

[10] This split has previous been provided to the Company.

Weighted Percentage			**9.7%**

This methodology resulted in a 9.7% uplift value. Applying this percentage to the data results in the following scope adjustment.

Table 26: Option 2 scope adjustment calculation

Option 2 – SOC Wages		
A	NI Water Employment Cost	£57.7m
B	Uplift Factor (SOC Wage Differential)	9.7%
C	Comparator Company Cost (A*B) + A	£63.3
D	Scope Adjustment (C-A)	£5.6m

The results of this option are open to criticism given that the SOC splits represent a rough estimation by the Regulator. It could further be argued that the proportion of workforce does not correspond with the actual wages commanded by these groups. In contrast, the methodology has attempted to get a better understanding of the regional wage advantage experienced by the Company. Moreover, an allowance has been made for the technical grades where the differential with the UK is very small, much like the utility industry comparison.

7.9. **Option 3: Median Wages** – This option simply reflects the variance of median wages between Northern Ireland (£417.6) and the UK (£478.6).

Table 27: Option 3 scope adjustment calculation

Option 3 – Median Wages		
A	NI Water Employment Cost	£57.7m
B	Uplift Factor (Median Wage Differential)	14.6%
C	Comparator Company Cost (A*B) + A	£66.1
D	Scope Adjustment (C-A)	£8.4m

At the most basic level this type of adjustment would seem a fairly reasonable approach. In contrast, given the information available on water sector wages, it does appear that the scope difference would be an over-estimation. NIAUR is keen to exercise caution in this analysis so would be wary of applying such a significant negative special factor.

7.10. **Option 4: Hybrid Model** – The final alternative represents a mixed approach. Within this model NIAUR have attempted to apply a 14.6% uplift to those staff costs it considers to be of a generic skill variety. The remaining water sector employment costs are applied the 1.1% uplift representative of this industry. Non-water sector staff are considered to be managers & senior officials, professionals and administration staff. Water industry employees are represented by associated professional and technical

workers, skilled trades and plant and machine operatives. The table highlights the calculation of the special factor.

Table 28: Option 4 scope adjustment calculation

Option 4 – Hybrid Model					
	Staff Split	**% split**	**NIW Costs**	**Uplift (%)**	**Scope Factor**
Non-Water				14.6%	
Water				1.1%	
Total	**1,724**	**100%**	**£57.7m**		**£2.5m**

This approach has certain flaws in that the percentage of staff numbers may not represent the same proportion of employments costs, as the Regulator has assumed. The model does however attempt to provide a reasonable estimation of the scope adjustment given the statistical uncertainties.

Conclusion

7.11. After consideration of the options, the Regulator is of the opinion that Option 2 (£5.6m) is a fair determination for this scope adjustment. This approach represents a compromise of the other alternatives. There is an adjustment to reflect NI Water's undoubted advantage by virtue of its location; although there is also recognition that water industry wages (associate professional and technical staff) is largely comparable with the rest of the UK.

7.12. There is recognition that these results are challengeable given the assumptions made by the Regulator. In the event we are minded to reconsider if the Company can bring further pertinent evidence to light. Further representation or views on the negative scope adjustment will be taken into consideration once submitted with NI Water's PC10 Business Plan on 1st June 2009.

Summary conclusions

8.1. After initial consideration of NI Water's special factors claim, the Regulator has made a number of conclusions including:-

- NIAUR have major difficulty accepting the alternative water distribution unit cost model proposed in the special factor report. Although there is acceptance that some allowance must be made for rurality, the Company has failed to make a strong enough case for the amount initially claimed. There is, in addition, the belief that significant levels of inefficiency exist within NI Water in this functional area. The Regulator would wish to see a much more comprehensive return in terms of the cost drivers and the make-up of the distribution network before a £22m claim could be considered. NIAUR does however consider our £7.22m allowance to be of a reasonable level given the information provided.

- The Regulator accepts the rationale for the power claim and the fact that an uncontrollable differential in costs exists in Northern Ireland. Some reservations exist by virtue of the fact that NI Water average price is outside the typical range of a large user in Northern Ireland. The Reporter has further raised the issue that the optimum level of electricity usage has not been reached. As a consequence our allowance of £2.67m is less than the amount proposed by NI Water and represents a 31.5% reduction in the claim.

- Some concerns over the quantification of the travel cost claim still exist. However, the Regulator is minded to reject this claim as it falls below the materiality threshold and will not substantially affect any relative efficiency comparisons.

- The approach taken by NI Water in relation to a metering scope adjustment is considered reasonable, even though strong arguments exist for increasing the value. The analysis is somewhat flawed in that no consideration has been given to bad debt, although this is a difficult impact to gauge. Given the current efficiency methodology utilised by the Regulator, no such adjustments are required. This is due to the likely exclusion of business activity models from our comparative efficiency assessment. Accordingly no scope adjustment in this area is required so the claim has been dismissed.

- A negative scope adjustment of £5.6m has been determined for regional wages. The Regulator considers this to be reasonable given it reflects as far as possible the advantage NI Water enjoy by operating in a lower cost environment to the rest of the E&W industry.

8.2. The Regulator would welcome any further representation from the Company included within its PC10 Business Plan submission on 1st June 2009.