APPENDIX B2

UPDATED COST BASE

Audit report on the updated submission
(11TH May 2005)

WICS REPORTER SERVICES
STRATEGIC REVIEW OF CHARGES 2006
UPDATED COST BASE (11TH May 2005)

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RECORD OF ISSUE

Issue	Date	Description	Prepared	Checked	Approved
0	17/5/05	Draft to SW for review	JBM	DA	DA
1	19/5/05	Report to WICS	JBM	DA	DA
2	20/06/05	Incorporated as Appendix B2 of Reporter's Report	JBM	DA	DA

B2-1. INTRODUCTION

The Water Industry Commissioner for Scotland (WICS) has functions and duties established under the Water Industry Act 1999 and confirmed in the Water Industry (Scotland) Act 2002 for the regulation of the water industry in Scotland.

The WICS has appointed a named regulatory Reporter for the Scottish water industry to assist in the discharge of his duties. Mr David Arnell of Black & Veatch is the named regulatory Reporter (the Reporter).

Scottish Water has submitted its second draft Business Plan for the Q&SIII period 2006-2014. The second draft Business Plan will include estimated costs for the capital programme to maintain existing assets, secure compliance with existing obligations, meet new obligations, address changing patterns of supply and demand, improve level of service of customers and provide the facilities necessary to manage the service. WICS will use the second draft Business Plan to develop his Strategic Review 2006 (SR06) which will include a determination of the level of funding necessary to allow Scottish Water to meet its obligations.

As part of the SR06 process Scottish Water has prepared a final Cost Base in response to WICS definitions provided under cover of the WIC56 letter issued on 20 December 2004. The Cost Base definitions are those issued by Ofwat for the 2004 Periodic Review in England & Wales (PR04). The Cost Base will be used by WICS to assist in the analysis of capital efficiencies which will be applied in SR06. Scottish Water submitted drafts of its Cost Base on 7th and 25th February 2005 and a final Cost Base was submitted on 15th April 2005. The draft submissions were audited by the Reporter and reviewed by an Independent Technical Expert appointed by WICS. A further request for information was issued by WICS and Scottish Water submitted updated Cost Base tables to WICS under cover of a letter dated 11 May 2005.

The Reporter was instructed by WICS to report on the updated Cost Base tables.

This resulting report has been prepared by a Reporter's team under Mr Arnell's direction, composed of senior staff of Black & Veatch.

The team reviewed the scopes of work and estimates prepared by Scottish Water for each element of the draft Cost Base. Following this initial review comments were issued to Scottish Water and additional information received from Scottish Water. The audit focused on understanding Scottish Water's response to the definitions. Particular attention was paid to consistency between the development of scope and estimates for the second draft Business Plan and the updated Cost Base.

This report comments on changes from the final Cost Base submission. It should be read in conjunction with the Reporter's report on the Cost Base submission. If instructed to do so, we will submit an updated report on the Cost Base incorporating this report.

This report has been prepared by the Reporter for the use of the Water Industry Commissioner for Scotland and Scottish Water only and is written assuming the knowledge already held by these organisations and the objectives of these organisations in undertaking the work covered by the report. No responsibility is accepted by the Reporter or Black and Veatch for any reliance that may be placed by any third parties on the information contained in this report.

B2-2. WATER INFRASTRUCTURE STANDARD COSTS

B2-2.1 Table 1: Water infrastructure standard costs

There are no changes to Table 1 from the final Cost Base submission of 15th April. We have no further comment.

B2-2.2 Table 2: Water mains projected expenditure

Scottish Water has made moderate changes to the allocation of expenditure from the final Cost Base submission of 15th April 2005.

In our report on the final Cost Base submission we noted that: "*During our audit we noted that reactive maintenance, which had been substantially increased in the 2nd draft business plan, had not been included in the analysis. At the same time Scottish Water noted an error in its calculation. Scottish Water has now amended its submission of Table 2. This has resulted in a significant change to the amount of costs allocated to the surface types in Table 2. We assume that Scottish Water will be resubmitting this table.*"

We confirm that Scottish Water's revised figures correct the error identified in the previous submission. Based on our audit of the final Cost Base submission, we consider the new allocation to be reasonable.

B2-3. WATER NON-INFRASTRUCTURE STANDARD COSTS

B2-3.1 Table 3: Water non-infrastructure standard costs

Introduction

Scottish Water has submitted revised or additional standard costs for the following:

Line 3.1	New treatment works type SW2, output 30Ml/d
Line 3.2	Replacement filtration system at an existing water treatment works, type SW2, output 30Ml/d
Line 3.3	New abstraction borehole treatment works with simple disinfection only, output 8Ml/d
Line 3.4	Fitting new plumbosolvency control to existing abstraction borehole treatment works with simple disinfection only, output 8Ml/d
Line 3.5	Alterations to water treatment works type SW2, output 30Ml/d
Line 3.7	Cryptosporidium protection to an existing borehole treatment works with simple disinfection only, output 2.5Ml/d
Line 3.17	Replacement motor control centre for an existing variable speed pumping station, 15kW total installed capacity
Line 3.18	Replacement motor control centre for an existing variable speed pumping station, 90kW total installed capacity

Comments by Line

Line 3.1 *New treatment works type SW2, output 30Ml/d*

Revisions Scottish Water has revised the standard cost estimate from the draft submission by:

1. Adding a flocculation stage prior to the filters.
2. Increasing the size of the dirty washwater tank to accommodate two backwash volumes.
3. Adding a lamella clarifier for the treatment of filter backwash water with associated pumping stations and polyelectrolyte dosing.

Reporter comment: We have the following comments on the revised standard cost submitted by Scottish Water which are in addition to those in our report on the final Cost Base submission:

1. We note that the clarification stage has been added to the backwash treatment stream as required by the revised reporting requirements.

2. No allowance is made for flow monitoring and sampling on the backwash treatment stream which is included in similar processes in the Business Plan estimates.

3. The pumping stations associated with the lamella clarifiers have not been costed using the cost function applied to similar processes in the Business Plan estimates. The size of one of the pumping station in the estimate is not consistent with the design provided by Scottish Water.

4. A single polyelectrolyte store has been assumed in the standard costs. Similar processes in the Business Plan estimates assume that separate polyelectrolyte stores will be provided for each polyelectrolyte dosing point. Scottish Water has commented that it is reasonable to assume an integrated polyelectrolyte store in a standard design whereas the Business Plan involves retro-fitting polymer dosing at separate points on existing plant constrained by the layout of the existing plant.

5. No specific allowance has been made for pH control. Similar estimates in the Business Plan appear to make a specific allowance for chemical dosing and chemical store for pH control.

6. We accept that a dirty washwater tank, sized for two backwash volumes is reasonable.

Line 3.2 *Replacement filtration system at an existing water treatment works, type SW2, output 30Ml/d*

Revisions Scottish Water has revised the standard cost estimate from the draft submission by:

1. Increasing the size of the dirty washwater tank to accommodate two backwash volumes.

Reporter comment: We have the following comments on the revised standard cost submitted by Scottish Water which are in addition to those in our report on the final Cost Base submission:

1. We accept that a dirty washwater tank, sized for two backwash volumes is reasonable.

Line 3.3 *New abstraction borehole treatment works with simple disinfection only, output 8Ml/d*

Scottish Water has not submitted a previous estimate for this standard cost.

Scope of works The scope of works covers the following:

1. A new the borehole following the scope of works in the information requirement.

2. A substructure and superstructure for the pumping station of 4 m2.

3. Pumping plant.

4. Chlorination by chlorine gas including a static mixed and flow and quality measurement for chlorination control.

Reporter comment: We have the following comments on the standard cost submitted by Scottish Water:

1. The estimate for the borehole is a bottom up estimate prepare by Scottish Water Solutions. We have not audited the source of the rates. There are no similar estimates in the Business Plan against which this estimate can be compared.

2. The power calculated for the pump appears to be reasonable. The pumping plant is costed using a cost function for the M&E plant of a submersible pumping station as opposed to a specific cost function for a borehole pump. We note that borehole pumps are part of KSB's framework. KSB pump costs have been used in the pumping station estimates.

3. We understand that Scottish Water has assumed a chlorine dosing rate of 0.3mg/l at maximum flow. A figure of 0.5mg/l is usually required to allow for a residual in the distribution system.

4. No allowance has been made for interconnecting pipework.

5. In its investment programme we note that for smaller works Scottish Water has moved from chlorine gas to hypochlorite installations. These would be at a lower cost than the gas installation included in the standard cost.

Line 3.4 *Fitting new plumbosolvency control to existing abstraction borehole treatment works with simple disinfection only, output 8Ml/d*

Revisions Scottish Water has revised the standard cost estimate from the draft submission by:

1. Adding a phosphate monitor.

Reporter comment: We have the following comments on the revised standard cost submitted by Scottish Water which are in addition to those in our report on the final Cost Base submission:

1. Scottish Water has included a specific estimate for a phosphate monitor. When Scottish Water has costed phosphate monitors in the Business Plan using a flow and sampling cost function has been applied which results in a higher cost than the specific estimate in the standard cost.

Line 3.5 *Alterations to water treatment works type SW2, output 30Ml/d*

Scottish Water has not submitted a previous estimate for this standard cost.

Scope of works The scope of works covers the following:

1. A drywell pumping station to feed a new micro-filtration plant.
2. A micro-filtration plant.
3. A building to house the new filtration plant.

Reporter comment: We have the following comments on the standard cost submitted by Scottish Water:

1. The pumping plant is costed based on the installed power. Scottish Water has a included a duty pump only in the standard cost estimate.
2. The micro-filtration plant is costed using flow as a yardstick. We understand that the cost function applied comes from Scottish Water Solutions' costing system. We did not audit this particular cost function because it did not figure in the Business Plan. Because the cost function was not material to the Business Plan, Scottish Water Solutions review of the cost functions did not focus on this function. Further work on this function would require a special visit to SWS to audit its makeup.
3. Scottish Water has assumed that the cost function includes all chemical cleaning and backwash tanks required by the process. There are no similar estimates in the Business Plan against which these assumptions can be tested.
4. We note that the cost appears to be low when judged against the costs for Invercannie WTW and our own experience. Scottish Water considers that it is unreasonable to compare the membrane flux rate (which drives size and cost) for the plant in the standard cost estimate with specific plant constructed in the past due to differences in water quality. Scottish Water has costed the membrane plant using a cost function which has flow as a yardstick. We do not believe that this cost function distinguishes between different membrane flux rates.
5. The size of the building appears to be reasonable for plant of this size.
6. No allowance has been made for interconnecting pipework.

Line 3.7 *Cryptosporidium protection to an existing borehole treatment works with simple disinfection only, output 2.5Ml/d*

Scottish Water has not submitted a previous estimate for this standard cost.

Scope of works The scope of works covers the following:

1. A drywell pumping station to feed a new micro-filtration plant.
2. A micro-filtration plant.
3. A building to house the new filtration plant.

Reporter comment: We have the following comments on the standard cost submitted by Scottish Water:

1. The pumping plant is costed based on the installed power. Scottish Water has included a duty pump only in the standard cost estimate.
2. For the membrane plant see our comments on Line 3.5.
3. The size of the building appear to be small for plant of this size, when compared to our benchmark.
4. No allowance has been made for interconnecting pipework.

Lines 3.11 to 3.16 Pumping stations

Scottish Water has not revised these costs. In our report on the final cost base submission we commented as follows:

The costs of pumps were properly supported by a letter from KSB giving prices and stating that they were as the framework agreement. However, when we audited the schedules in the agreement we noted that the prices stated in the letter were significantly lower than those in the schedule. Scottish Water is trying to reconcile the differences with KSB, but at the time of writing this report no response was available. We believe that the difference will be explained by discounts offered and that the estimates will prove to be satisfactory.

We have now seen further information provided by KSB and confirm that we believe that the estimates have been prepared with pump costs that are consistent with Scottish Water's supplier framework.

Lines 3.17 to 3.18 Replacement MCCs

Revisions Scottish Water has revised the standard cost estimate from the draft submission by including for a PLC and RTU in the MCC costs.

Reporter comment: In our report on the final cost base submission we commented as follows:

We noted that a PLC and RTU had not been included in MCC standard costs in lines 3.17, 3.18, 7.10 and 7.11. While not altogether clear, the specification implied that they should be included. We would like confirmation from WICS that the benchmark does include for a PLC and RTU.

Should it be confirmed that the PLC and RTU should be included, then Scottish Water should revise its standard cost estimate.

1. We confirm that the revised figures reflect the adjustments suggested above. We assume that the benchmark does include for a PLC and RTU.

B2-3.2 Table 4: Water service – composition of expenditure by asset type

Scottish Water has made a minor amendment to Lines 4.1 and 4.6 because during our audit we noted a very minor error in the allocation of resources to lines 4.1 and 4.6. We confirm that the revised submission includes this minor change.

B2-4. SEWERAGE INFRASTRUCTURE STANDARD COSTS

B2-4.1 Table 5: Sewerage infrastructure standard costs

There are no changes to Table 5 from the final Cost Base submission of 15th April. We have not further comment.

B2-4.2 Table 6: Sewer projected expenditure

There are no changes to Table 6 from the final Cost Base submission of 15th April. We have not further comment.

B2-5. SEWERAGE NON-INFRASTRUCTURE STANDARD COSTS

B2-5.1 Table 7: Sewerage non-infrastructure standard costs

Scottish Water has submitted revised or additional standard costs for the following:

Line 7.1 Storage tank to combined sewer overflow, capacity 750m3

Line 7.2 Large storage tank to combined sewer overflow, capacity 3000m3

Line 7.3 Combined sewer overflow chamber with powered screen

Line 7.10 Replacement motor control centre for an existing fixed speed pumping station, 15kW total installed motor capacity

Line 7.11 Replacement motor control centre for an existing fixed speed pumping station, 90kW total installed motor capacity

Lines 7.1 & 7.2 - Storage tank to combined sewer overflows, capacity 750m3 and 3000 m3

Revisions Scottish Water has revised the scope of the standard cost estimates from the draft submission by:

1. Assuming that the ground level at the storage tank is the same as that at the sewer.

2. Preparing a more detailed scope for the return pipework to the sewer including a valve chamber.

3. Deleting an ultrasonic level detector which was duplicated in the previous estimate.

Reporter comment: We have the following comments on the revised standard cost submitted by Scottish Water which are in addition to those in our report on the final Cost Base submission:

1. Scottish Water has increased the ground level at the shaft. Scottish Water has provided details of the tank configuration which shows that the storage volume will be achieved when the top water level in the tank is 400 mm below ground level. This would surcharge the existing sewer by 1.1 m before the nominal storage volume is achieved.

2. The valve chamber on the return pipework is significantly smaller than similar estimates in the Business Plan.

Line 7.3 – Combined sewer overflow chamber with powered screen

Revisions Scottish Water has revised the scope of the standard cost estimates from the draft submission by the following:

1. Basing the estimate on a circular chamber, consistent with similar estimates in the Business Plan.

2. Providing manholes at changes in direction on the connecting pipework.

3. Deleting an ultrasonic level detector included in previous estimates which duplicated scope covered by the screen package cost.

Reporter comment: We have no further comment on this standard cost.

Lines 7.4 to 7.9 *Pumping stations*

See our comments against lines 3.11 to 3.16.

Lines 10 & 11 *Replacement MCC*

Revisions Scottish Water has revised the standard cost estimate from the draft submission by including for a PLC and RTU in the MCC costs.

Reporter comment: See our comments against lines 3.17 and 3.18.

B2-5.2 Table 8: Sewerage service – composition of expenditure by asset type

There are no changes to Table 5 from the final Cost Base submission of 15th April. We have not further comment.