THE ALMOND VALLEY & SEAFIELD PFI PROJECT
RISK ISSUES ASSOCIATED WITH FLOW PREDICTION

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Introduction

In March 1999, East of Scotland Water (ESW) awarded its first Private Finance Initiative Services Contract to Stirling Water for the Almond Valley & Seafield PFI Contract. This paper describes the approach taken by ESW and Stirling Water in their respective roles as client and bidder with a particular focus on the risk issues associated with flow prediction.

East of Scotland Water is a public corporation established under Section 62 of the Local Government etc. (Scotland) Act 1994 as the statutory provider of water and sewerage services for its area which is the area covered by the previous Lothian, Borders, Central and Fife Regional Councils. Stirling Water is a Consortium formed between Thames Water plc, MJ Gleeson plc and Montgomery Watson Ltd. It was set up specifically as a vehicle to tender for PFI contracts.

In November 1996, East of Scotland Water (ESW) invited four consortia to submit bids for provision of a waste water treatment service for the Almond Valley and Edinburgh catchments as part of the Almond Valley & Seafield Private Finance Initiative Project.

ESW's approach to the Private Finance Initiative was to set its service performance requirements and provide bidding consortia with as much information as possible to allow them to develop design options and assess the risks associated with these options. The objective was to obtain value for money through exposure to the private sector, whilst ensuring capital expenditure did not fall on ESW's balance sheet. Good flow information was key to the successful delivery of the project. Although ESW had developed its own technical solutions it was non-prescriptive as far as the final technical solution was concerned as long as it met the scheme's objectives which among others included :

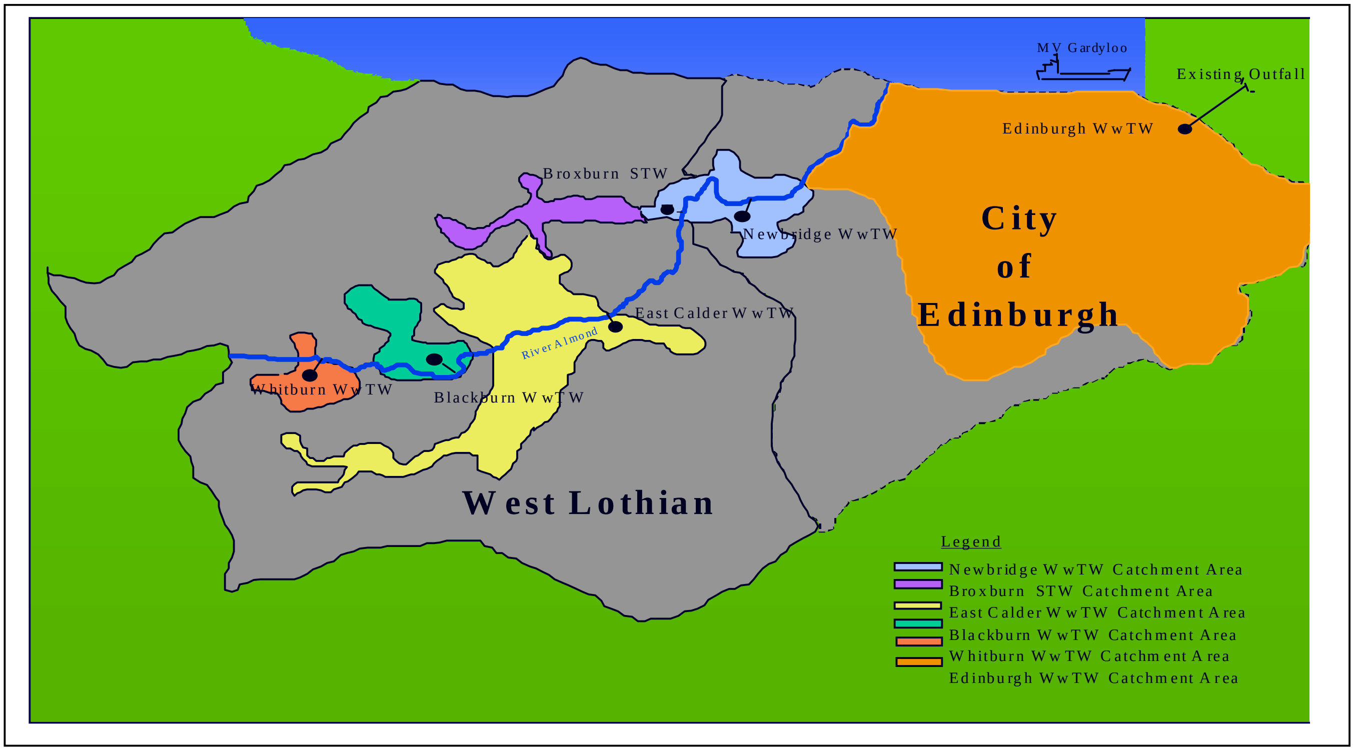
Compliance with existing and future Effluent Discharge Consents,

- Meeting future development needs
- Value for money through an optimal allocation of risks.

Background to the Scheme and the Service to be Provided

The River Almond is located in East Central Scotland (see Figure 1) and receives treated discharges, among others, from Whitburn, Blackburn, East Calder and Newbridge Waste Water Treatment Works with populations as given in Table 1. The River Almond is designated a "sensitive area" under the terms of the Urban Waste Water Treatment Regulations (UWWTR). This meant that the discharges from the works would have to meet new more stringent phosphate standards to meet the 1998 deadline of the UWWTR and new Water Quality Objectives set by the Scottish Environmental Protection Agency (SEPA) with improved discharges required by 2001. Each of the works on the River Almond have primary and secondary treatment, with some additional tertiary treatment. All have storm tanks which come into operation at about 3 Dry Weather Flow and discharge to the River Almond when full.

Edinburgh WWTW receives waste water from the Edinburgh catchment and adjacent conurbations. It currently discharges a primary treated effluent through a long sea outfall to a point some 2.8 km offshore. The outfall is situated adjacent to Edinburgh's "Riviera" which includes Portobello beach, now designated a bathing beach, and the proposed multimillion pound housing, leisure, business and continental ferry development at Leith Docks. Secondary treatment is required to be provided to meet the end of 2000 UWWTR deadline. The additional requirement to meet bathing beach standards was introduced during the bidding period. Storm discharges also discharge through the long sea outfall after 6mm



screening and retention in 4 No 10,000 m3 tanks.

Figure 1– The Almond Valley and Seafield Catchment Area

In addition to improvements in treatment standards for the works, the contract included for the provision of an alternative to sludge disposal at sea by the end of 1998.

Treatment Works	Population Served	
	Present	2023
Whitburn	11,200	13,000
Blackburn	11,500	12,700
East Calder	65,000	76,000

Newbridge	19,500	22,500
Edinburgh	480,000	520,000

Table 1- Populations Served

Catchments served by the Almond Valley and Edinburgh works contain both separate and combined sewerage systems with a number of combined storm overflows discharging to local watercourses.

The scheme developed by Lothian Regional Council, prior to the formation of East of Scotland Water in April 1996, was valued at £140m. With capital allowance of £70m per year and a forecast investment of £900m over 5 years it was clear that the only option that ESW had to meet the Urban Waster Water Treatment Directive was through the Private Finance Initiative.

In the PFI Contract, the Service Company (Special Purpose Company set up for the Contract) would provide a waste water treatment service for ESW. It would be required to receive waste water at agreed entry points to each of the works and treat it to the required standards. Payments to the Service Company would be based on volume of waste water receiving full treatment. The reason for paying on a flow related basis is to ensure that ESW does not need to capitalise the project assets and liabilities on its balance sheet because the Service Company is carrying substantially all the risks and rewards of ownership of the assets. The Service Company would be responsible for the finance, design, construction and operating of the facilities over the concession period, typically 25 years.

Data Collection

ESW formed a dedicated team to manage all its PFI projects, viz. the Special Projects Unit in its Development Department. One of its first major tasks was to analyse data requirements. This revealed that although there was a considerable amount of information readily available there was also a significant amount that required further investigation.

The following main areas were identified:

- Catchment Data
    - Existing and Future Flows/Hydraulic Modelling
    - Development Requirements
    - Planned Alterations to System
    - Trade Effluent
    - Influent Quality
- Existing Works/Site Data
    - Site Investigation Information/Ground Conditions
    - Record Drawings/Design Calculations/Specification
    - O&M Manuals
    - Condition Surveys
    - Costs
    - Employee Conditions

- Information on Receiving Waters
  - River Flows
  - Water Quality Objectives
  - Indicative Discharge Consents
- Information on Previous Proposals
  - Almond Valley Trunk Sewer and Storm Works
  - Sewage Sludge Incinerator

All the information collected was either given directly to the bidders with the tender documents or made available for inspection in a dedicated data room.

Accurate flow estimates were considered to be essential for the successful delivery of the project, including assessment of base-line flows for each of the works at the start of the contract, and estimated changes in flow during the life of the Services Contract. If flow levels are underestimated ESW could end up paying more than expected and if flow levels are overstated the Service Company could suffer an income shortfall. Good flow information would also enable the bidders to size the plant and consider any phased capital expenditure.

Historical flow information was available from Warren Flow recorders at each works over a period of several years.

Hydraulic modelling had previously been undertaken by the former Lothian Regional Council, during the period October 1994 to October 1995. In anticipation of the requirements of the PFI process further modelling work was commissioned in August 1996 to validate the 'macro' Hydroworks hydraulic model built in 1994/95 and to build verified Type II Drainage Area Planning hydraulic models of the existing drainage catchments for Whitburn, Blackburn, East Calder and Newbridge WWTW. This work was carried out by Montgomery Watson under a "Chinese Wall" arrangement which was essential to maintain confidentiality between the modelling team advising ESW and the design team advising Stirling Water. This was accomplished by teams working from separate offices, correspondence being dealt with separately and each member of the modelling team signing a confidentiality agreement.

Completed models were given to the bidders in February 1997. ESW offered training in the use of the models which included:

- a description of the various models in terms of the way the various catchments had been represented;
- a resume of the extent of the flow survey data collected, stressing quality of the information received;
- a description of the verification exercise concentrating on any areas of uncertainty;
- a summary of the potential application of the model (drainage area planning, detailed design etc) together with an assessment of the likely error bands; and
- any special features of the models which are unusual.

Also a user manual was provided to complement the training programme and bidders were invited to identify any special requirements they may have wanted over and above that specified.

It is important to note that ESW did not warrant any information given to the Bidders. Bidders were expected to make their own judgement on the accuracy of the data given to them. Access was given to all sites and available records to allow Bidders to check data if they so wished.

Working Relationships and Confidentiality

ESW and its advisers held a series of technical, commercial and legal discussions with the Bidders during the Tender Period. The purpose of the discussions were:

to help Bidders understand ESW's requirements; and

to ensure that Bidders had the opportunity to comment on the tender documentation and accompanying information.

Bidders were required to submit an indicative programme of their Bid development activities giving the dates of meetings they wished to hold with ESW to discuss the technical development of their proposals. Bidders were expected to forward agendas for each meeting at least one week before the meeting was to be held. All meetings were minuted by the Bidders and sent to ESW for agreement.

Bidders were also expected to liase with the relevant Statutory Authorities, i.e. SEPA and the local planning authorities to establish their views on the options being considered. Bidders were required to copy to ESW agreed minutes of any meetings held and any relevant correspondence.

Confidentiality of the development of the technical proposals was of prime importance to the Bidders. This was achieved by all parties through dedicated teams and information being restricted to those on a need to know basis. ESW used code names for each of the Bidders "Mars, Jupiter, Saturn and Venus" for internal and external consultation and reporting. Halcrow Crouch assisted ESW as technical advisors during the tender evaluation. The evaluation team worked in dedicated accommodation at ESW's Fairmilehead offices.

The Bidder's Perspective

For all parties concerned including client, operator and regulators, the PFI system has distinct differences from other more familiar types of contract. The need to identify and manage risk within the contract is brought into focus much more clearly in PFI than in most other arrangements including conventional construction or operating contracts and even design and construct contracts.

From Stirling Water's point of view, a further difference is that as well as each of the three companies which make up the consortium having, in effect, an internal as well as an external client, Stirling Water itself has at least two clients in the shape of its own financial backers as well as ESW. At least as much effort went into convincing the project financers that the risks and likely return on investment were acceptable, as went into convincing ESW to award Stirling Water the contract. Significant effort also went into seeking the views of other interested parties such as SEPA and planning authorities and keeping them informed of proposals.

The Tender Process

The circumstances in which the early feasibility and design work for the project were carried out were significantly different from those with which we are familiar in more traditional design contracts. For all involved parties the combination of the competitive environment, confidentiality issues, regulatory issues, limited timescale and limited availability of data at tender stage presented a significant challenge. This, compounded by an unfamiliar and comparatively high risk commercial framework placed the bid team, comprising staff from all three of the consortium companies, under considerable pressure during the initial bid period. A high level of commitment was required from individuals, and the formation of a dedicated team able to commit fully to the PFI tender process was essential to the success of the bid. Close working with ESW staff, and with SEPA and other organisations, was essential, whilst maintaining the commercial requirement for confidentiality.

During the initial three month tender period it was necessary for Stirling Water to understand and assess the project scope and contractual and regulatory requirements, develop options for the five WwTWs, evaluate them for feasibility and cost, and develop outline designs for the proposed upgrading. The financial risk assessments had to consider both capital expenditure and operating costs, and determine the income stream required to fund them.

UPM Analysis in the Almond Valley

Bidders were expected to use sewer hydraulic models and river quality models to develop any solutions which incorporated storm combined storm overflows in accordance with guidance given in the Foundation for Water Research (FWR) publication “Urban Pollution Manual” (November 1994) and the Draft Scottish Office Environmental Department Guidance Note accompanying the Urban Waste Water Treatment (Scotland) Regulations 1993 – Annex E “Framework for Consenting Interim Discharges”. This was to be done to the satisfaction of SEPA. SEPA had a model of the River Almond which was made available to Bidders.

To comply with this requirement Stirling Water carried out a significant amount of hydraulic and sewer quality modelling work during the tender period. This included an analysis using the Urban Pollution Management (UPM) methodology to determine storage requirements at the Almond Valley WwTWs. The UPM methodology was used in order to identify the optimum storage volumes in order to comply with water quality standards for intermittent discharges.

The study was carried out in close consultation with SEPA who provided background data on the river and were forthcoming in setting out their objectives and concerns in relation to water quality in the river. Intermittent discharge standards were agreed with SEPA using the UPM 1 methodology by determining gradient and width/depth ratio for the river at the critical reach downstream of each WwTW.

The existing hydraulically verified sewer models were amended to include representative pollutant loads, with particular attention being paid to inputs from trade flows within the sewer catchments. The models were then each run with a 10 year summer rainfall series derived using STORMPAC. Results from the sewer models runs were combined with river and WwTW flows and pollutant flows in a Monte Carlo analysis to determine pollutant concentrations at one year and one month return periods.

The analysis indicated that, with current levels of storage, the river is predicted to fail at most sites for ammonia and pass marginally for BOD. However, this result is influenced to a large degree by the relatively low treatment standards which currently pertain at the WwTWs. It is the continuous discharges of WwTW effluent rather than spills from CSOs and storm tanks which are the source of most of the pollutant load. When the analysis was rerun using the proposed WwTW effluent discharge standards, the river was predicted to pass for BOD and ammonia at all locations.

The results of this modelling work led to an immediate and significant saving in projected capital expenditure, as without it large volumes of additional storage would have been necessary at each WwTW in order to comply with SDD storage requirements. As well as reducing capital costs it also eliminated a significant area of risk, in that the land take, construction activity, and planning requirements for the new storage would have been considerable.

Modelling was used in other areas during the bid in order to identify savings and quantify the risk associated with different components of the scheme.

Flow Prediction for Revenue

Estimation and projection of flows and loads is an important component of any WwTW study. In the case of the Almond Valley and Seafield PFI it took an extra level of significance because payment throughout the contract period would be based on the volume of effluent receiving full treatment.

The risk on variation of flows throughout the contract period is shared between Stirling Water and ESW via a flow banding structure. Different charging rates are applied for different annual flow bands. The highest flow banding carries a zero charging rate, effectively placing a cap on the annual payment which ESW is obliged to make to Stirling Water under the contract.

Considerable effort therefore went into the analysis of existing and projected flows.

The main sources of data available for this task at tender stage comprised the following:-

Historical Flow to Full Treatment data from the WwTWs
Verified HydroWorks models of the sewerage systems
Short term flow survey data used in the verification of the sewer models
ESW estimates and forecasts of populations and flows
ESW records of industrial wastewater discharges
Historical rainfall data
Various public documents including local plans

The analysis required the total flows to be broken down into constituent parts as follows:-

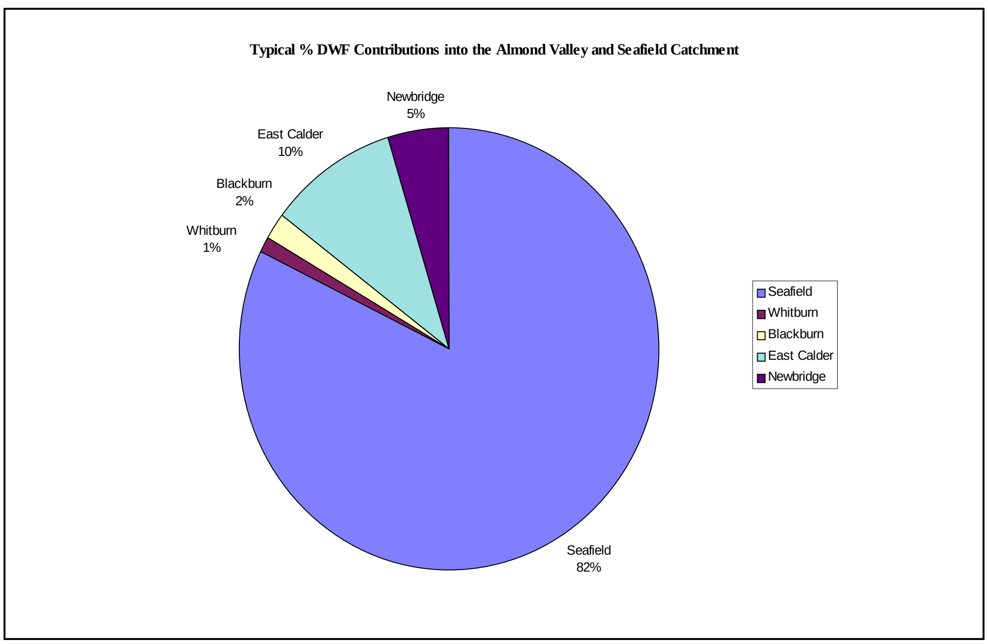
Population (and growth)
Per capita flow
Industrial flow (and growth)
Infiltration
Storm flow

All available data from the various sources mentioned previously was collated and an initial comparison was carried out. As is often the case on such studies, significant discrepancies were found between the various sources. Population estimates vary depending on sources used, assumptions about catchment extents, inclusion or otherwise of tourists, students etc. Growth rates vary depending on assumptions regarding new developments and changes in occupancy rates in existing developments. Per capita flow rate is often hard to define in relation to water consumption rates, as losses are difficulty to quantify accurately, and service areas may not coincide. Existing industrial flow rates were established with reasonable certainty, but growth rates are inevitably subject to economic and planning factors which cannot readily be forecast over more than a few years.

Although all five catchments had to be considered in the assessment of flows for payment, the majority of flow is derived from the Seafield catchment. Determining existing and future flows in this catchment was therefore identified as a priority. Figure 2 below shows the breakdown of DWF between the various catchments.

Although there were uncertainties in all the various DWF components, it was apparent that the most significant factor and uncertainty in the estimation of flows would be infiltration.

It was evident that infiltration was a major proportion of DWF in all the catchments, but this could only be quantified by reference to the flow measurements at the WwTWs or as part of the short term flow survey. Since infiltration is both variable in time and highly catchment specific, it can only be determined by direct flow measurement as the difference between total

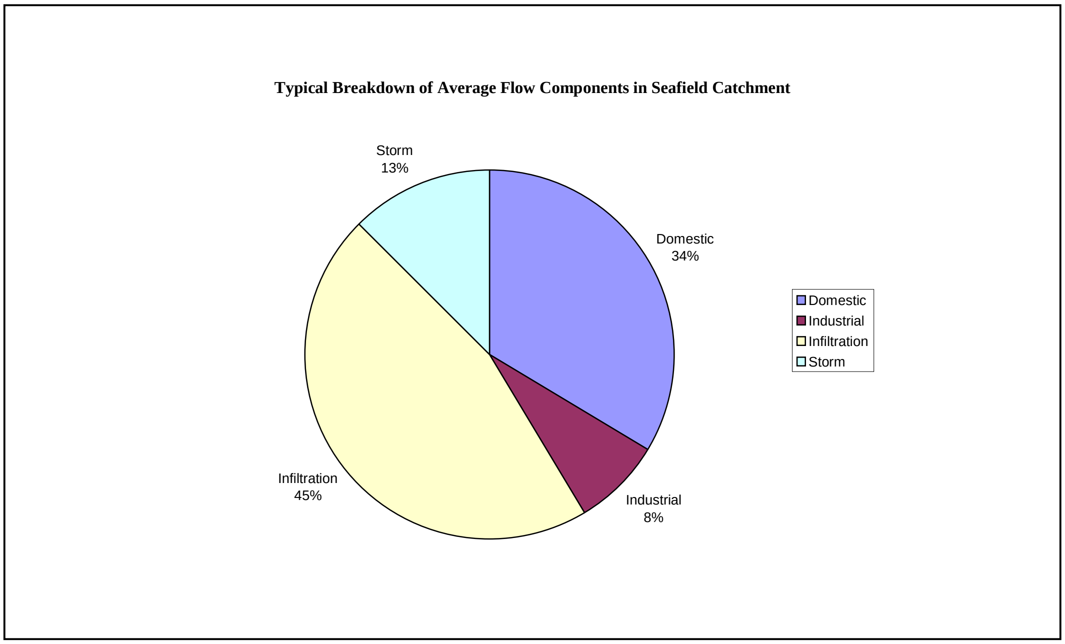


DWF and foul flow.

Figure 2

Irrespective of the accuracy with which foul flow could be determined, any estimates of total DWF would therefore only be as good as the measured data allowed. Whilst estimates of population and industrial flow remained important in terms of projections of growth rate and for treatment process design, subsequent analysis of DWF for revenue purposes focussed primarily on the measured flow data which was available.

Figure 3 below shows the approximate breakdown of flow into its various components within



the Seafield catchment.

Figure 3

WWTW flow records were available only for approximately four years. The data contained a number of gaps, and there were periods when the flow measurement system may have been out of calibration. These factors made it difficult to assess accurately the seasonal variation in flow which was expected due to the effect of winter rainfall on the catchment. This was evident during the short term flow survey carried out for model verification during December 1996. The flow survey coincided with an extremely wet period with some rain occurring on virtually every day of the survey. Table 2 below shows comparative figures from the WwTW records and from the short term flow survey for each of the catchments.

WWTW	Long term average	1996 average	1996 Model Study
Seafield	207,000 1993 to 1996	199,000	225,000
Whitburn	2,871 1992 to 1996	2,749	4,400
Blackburn	4,882	4,895	4,500

	1993 to 1996		
East Calder	25,391 1993 to 1996	29,337	35,000
Newbridge	11,579 1992 to 1996	8,696	10,200

Table 2 - Measured Dry Weather Flows (m^3/day)

It can be seen that with the exception of Blackburn, all catchments showed higher DWF during the short term flow survey than the respective average for 1996, although the picture is less clear when compared with longer term averages from all available WwTW data. This shows that the short term variation of DWF (i.e. on a month by month basis) may be significant.

Considering the longer term variation of DWF (i.e. on a year by year basis), the table below shows average DWF at Seafield for each year for which data was available, and annual rainfall at the two sites closest to the catchment. These figures do appear to confirm that dry weather flows, as well as storm flows, are influenced to some extent by the total rainfall within the catchment, but that the variations are not sufficiently significant to cause major concern. Major year on year fluctuations in flow would obviously be unwelcome as they would result in wide variations in revenue from year to year which would not necessarily be in phase with variations in costs.

Based on all the available data on foul flow components and infiltration, Stirling Water derived “Best Estimate”, “Minimum” and “Maximum” dry weather flow estimates for each year of the concession. The graph below (Figure 4) shows the figures which were derived for Seafield, with other flow estimates from ESW’s Bid Benchmark Commission (labelled CBM) used to compare the various bids, and figures derived by Halcrow who were working on ESW’s behalf later in the study.

Year	Edinburgh WWTW Average Dry Day Flow m^3/d	Botanical Gardens mm/year	Edinburgh Airport mm/year
1993	208,485 Based on August to November only	781	842
1994	203,801	645	709
1995	205,242	687	750
1996	199,835	528	580

Table 3- Derived DWF Figures

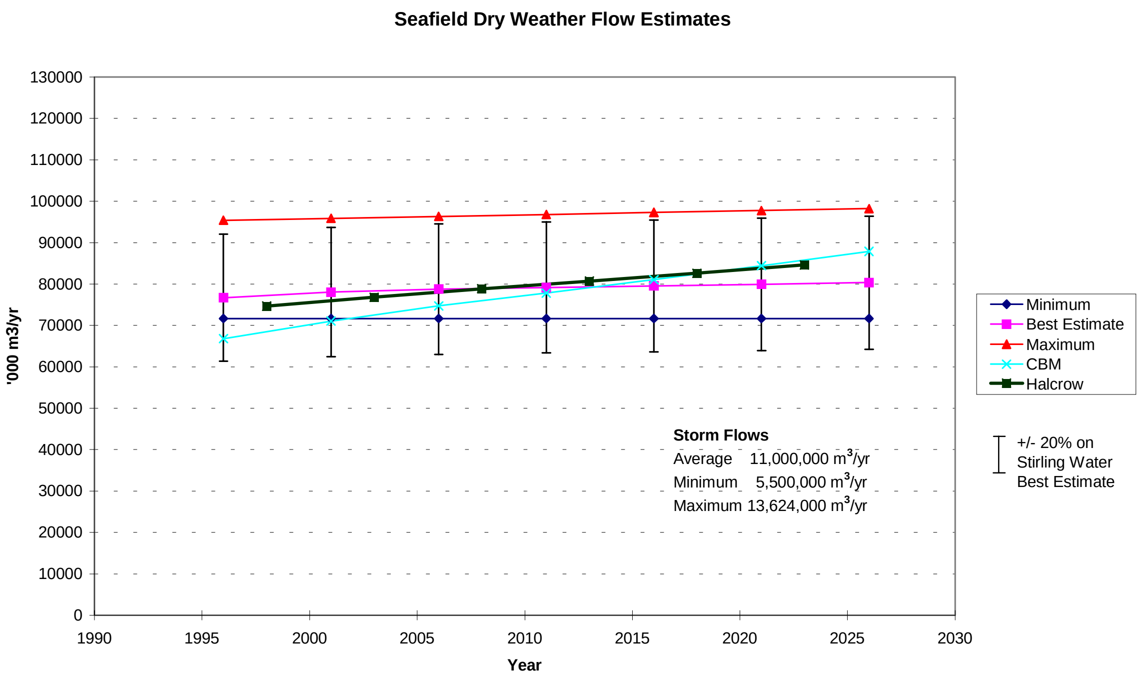


Figure 4

The minimum DWF flow shown above is based on 95% of measured DWF and no assumed growth over the concession period. Although lower “minimum” DWF figure was identified using minimum population and water consumption estimates and minimum infiltration calculations based on very dry summer months, this was not used by Stirling Water, as any figure significantly below the measured long term average was considered unrealistic. The 95% figure quoted above was to allow for possible systematic over-measurement in historical flows. The original maximum error was estimated at 10% but was reduced to 5% following agreement with ESW that such an error would not be allowed to penalise either party.

The maximum figure was based on high estimates of population, water consumption and infiltration with growth rates as for the best estimate figures. Higher growth rates combined with high estimates of existing DWF were not considered to be relevant, particularly since it was potential overestimation rather than underestimation of flows which was the primary concern to Stirling Water.

Storm Flows

Storm flows were assessed using the HydroWorks models of the five catchments. STORMPAC was used to generate a 25 year series based on annual rainfall totals from Wallingford Procedure/Flood Studies Report Maps and geographical parameters. Typical years were selected from these 25 year series and these series were the initial basis for the assessment of storm flows. However, when data became available from raingauges at Edinburgh Airport and Edinburgh Botanical Gardens it was apparent that recorded totals of 670mm and 632mm respectively were somewhat lower than the estimate from maps of approximately 750mm. A revised series was generated using the lower SAAR figure, and the driest and wettest years were also selected from the 25 year run for comparative purposes. A similar exercise was carried out for the Almond catchments using a SAAR figure of 800mm. API30 values were used in these series since the Almond Valley models all used the New UK Runoff Model.

Predicted storm flows in each of the catchments are shown in table 4 below:-

WwTW	Dry year m^3/yr	Average year m^3/yr	Wet year m^3/yr
Whitburn	205,000	241,000	287,000
Blackburn	273,000	344,000	426,000
East Calder	1,429,000	1,795,000	2,243,000
Newbridge*	692,000	894,000 (793,000)*	1,205,000
Edinburgh	11,600,000	14,100,000	16,700,000
Reduced annual rainfall	*9,701,000*	*11,000,000*	*13,624,000*
Total	***12,300,000***	***14,173,000****	***17,785,000***

* revised figure based on proposed modifications to Broxburn SWW

Table 4- Annual Storm Water Volumes

In percentage terms at each WwTW these are as follows:-

WwTW	Storm Flow % of DWF
Whitburn	23
Blackburn	19
East Calder	21
Newbridge	19
Edinburgh	14

Table 5- Annual Average Storm Water as a Percentage of Estimated 1996 DWF

The figure of 14% at Seafield, based on the lower annual average rainfall estimate is slightly lower than the figure suggested by long term flow records at Seafield which indicates 18%. This figure would be more consistent with model predictions using the higher SAAR figure of 750mm. This may indicate some systematic underprediction of storm flows by this version of the model, and it should be noted that further verification work has been carried out since that time which includes use of the New UK Runoff Model in certain areas subject to slow response runoff.

These figures were compared with records from various Thames Water WwTWs with comparable PE values to assess whether the figures were similar. This proved to be the case, with the majority of average flows lying in the range 110-130% of DWF, with an overall average of 120%

The possible effects of climatic change were considered in the analysis, but were not actually applied in deriving the estimates. Latest research suggests that the predicted effect of climate change in Scotland is for an increase in annual rainfall of 5% by the year of 2020. The effect of this on overall flow totals would therefore be of the order of 1%, and was not considered significant in the context of other uncertainties in the calculations.

BAFO Stage

In parallel with the modelling and flow estimation work described above, Stirling Water proceeded with preliminary design and costing of the capital works required at each of the WwTWs. This involved process design as well as civil, mechanical and electrical design input. Condition surveys of all the major plant were undertaken, and a detailed assessment of anticipated operating costs was also carried out.

Following the initial tender submission, two of the four consortia including Stirling Water were asked to submit their “Best and Final Offer”. This involved further data collection and extensive discussions with ESW and with other interested parties. The proposals which were derived for the initial tender were considerably expanded and refined, making use of new information which became available, and reflecting changes in scope which arose during the BAFO period.

Significant issues which Stirling Water considered in preparing the BAFO submission included the following:-

- Sludge reduction and reuse strategy
- Minimise transportation of sludge
- Odour alleviation
- Regulatory requirements for the River Almond
- Maximisation of existing assets
- Flexibility to meet future growth
- Minimisation of construction impact
- Planning constraints
- Possible designation of bathing waters around Edinburgh

The costs which Stirling Water derived for upgrading and operating the works were fed into a financial model developed by Stirling Water's financial team. This was used to assess the return which could be generated assuming different flow regimes, flow bands and charge rates during the contract period. Demonstrating an adequate financial return on investment to the scheme backers was essential to the viability of the bid. Based on the output from this model, the final flow band boundaries and charge rates were determined and presented to ESW as part of the BAFO submission.

Where are we now?

Stirling Water were awarded the Services Contract in March 1999. Payments based on flow will not start until the new works are completed towards the end of 2000. It will, therefore, be some time before a judgement can be made on accuracy of the work carried out and the decisions made. However, there are a number of important provisions in the agreed contract relating to flow.

- ESW is required to convey all waste water entering the sewerage systems within the catchments to Stirling Water for treatment.
- Stirling Water will take the full risk for domestic flows, the risk for industrial flow being shared by the provision of a cap on volumes for each works.
- ESW is required to notify Stirling Water of significant new housing developments (150 houses) and consult on significant new industrial discharges and keep Stirling Water informed of any proposed alteration in the collecting systems or of any forecast change in the volume or characteristics of flows which would have a significant impact on the project.

Stirling Water is required to monitor and measure flows to full treatment for payment purposes and relay instantaneous flow data to ESW via telemetry links to its control room at Fairmilehead on a continuous basis. Stirling Water are also required to produce monthly and annual summary reports. The accuracy of the flow measurement equipment is required to be independently verified at specified intervals during the concession period. ESW has the right to inspect the flow measurement equipment during normal working hours.

The next step will be to assess how these provisions are operating over a period of time. It will only be at the end of 2001, when the new works have been in operation for a year, that a review of the accuracy of the information gained from the hydraulic models can realistically begin, with annual reviews thereafter. Only time will tell whether or not the hydraulic modellers have earned their corn.

Discussion

Question Nick Orman WRc

PFI is about transferring risk, the criticisms from highway PFI schemes are that the risk that is transferred is not real risk. Is the risk created by the charging system?

What is done about the risk that East of Scotland Water carry out an infiltration reduction programme?

Answer

Transfer of risk has to be shown to be sufficient to comply with the accounting rules given in FRS5 to ensure that the CAPEX remains off ESW's balance sheet. Typically an analysis is made of realistic potential shortfalls in income against realistic potential increases in expenditure over and above that envisaged. The analysis is required to demonstrate a reduction in return to the investor to a degree which meets FRS5 requirements. For the Almond Valley and Seafield Project, income can be reduced in dry years and as in any process plant there is a real risk in maintenance and operational costs increasing over and above that envisaged.

As far as infiltration is concerned, and the impact of any actions by ESW to reduce flows, ESW has an obligation in the Contract to inform Stirling Water of any changes to the contributing catchment which may affect flows. Stirling Water would have to demonstrate that the changes will have had a material long-term downward effect on flows before changes to the tariffs would be considered.

Question Ed Bramley Yorkshire Water

How are trade effluents dealt with in terms of quality rather than quantity?

Answer

In the Services Contract, ESW is required to consult Stirling Water on new industrial discharges above a certain volume per day. If the new discharge is likely to have an adverse impact on the Influent Quality Specification, ESW can refuse the trade discharge, ask the trader to partially treat the discharge or negotiate a revised Influent Quality Specification with Stirling Water.