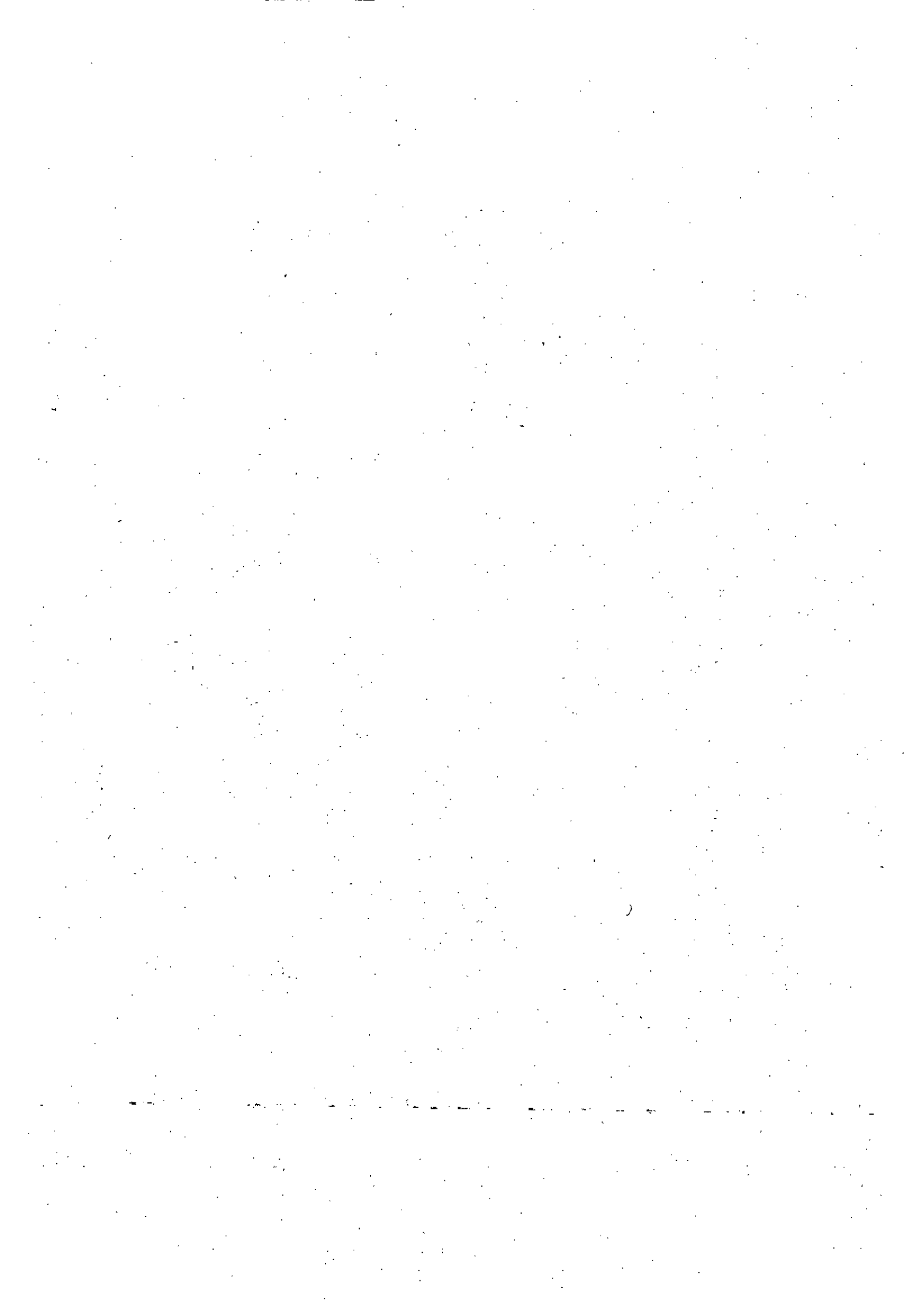


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An audit of performance in the analysis of biological samples in 1996

Environment Agency: AQC Audit

R.J.M. Gunn, J.H. Blackburn, J.M. Winder, J.F. Wright & K.L. Symes

Research Contractor:
Institute of Freshwater Ecology

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Environment Agency
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol
BS12 4UD

Publishing Organisation:

Environment Agency
Rio House
Waterside Drive
Aztec West
Almondsbury
Bristol
BS12 4UD
Tel: 01454 624400 Fax: 01454 624409

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Statement of Use

Information in this document is to help biologists in the Agency to identify where analytical errors occur so that they can be reduced or eliminated. Data in the tables provide measures of the accuracy of data produced in the Agency's internal Analytical Quality Control (AQC) scheme for samples analysed in accordance with the standard methods for the River Invertebrate Prediction and Classification System (RIVPACS) and analysed to the level required for the Biological Monitoring Working Party (BMWP)-score system, including General Quality Assessment (GQA). Information in this report may be used to determine the AQC parameters used in individual laboratories, as well as for estimating errors in the primary data from information obtained from AQC inspections.

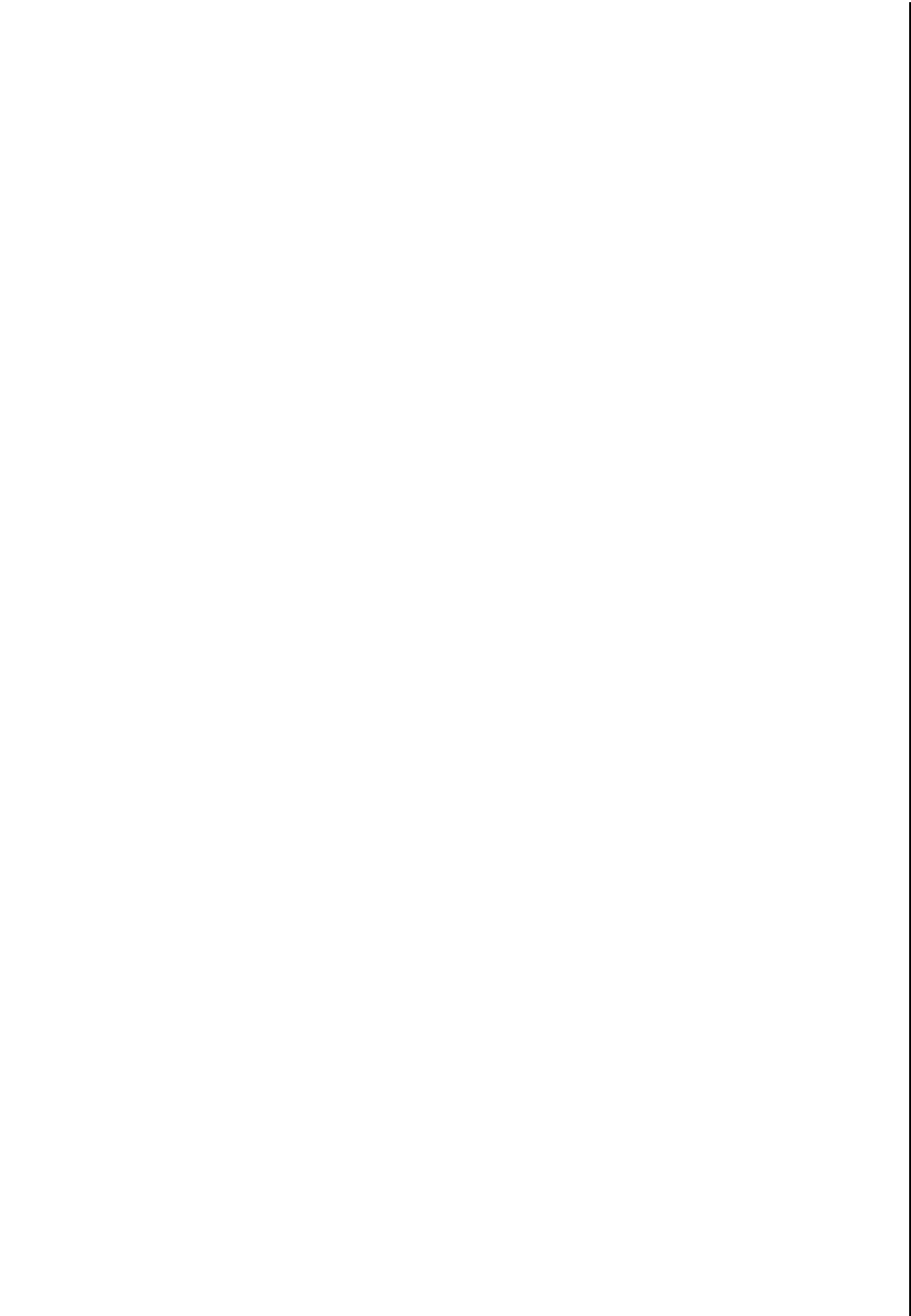
Research Contractor

Institute of Freshwater Ecology
River Laboratory
East Stoke
Wareham
Dorset BH20 6BB
Tel: 01929 462314 Fax: 01929 462180

Environment Agency's Project Manager
Dr JAD Murray-Bligh - Thames Region

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1. INTRODUCTION

In 1996 the sampling of aquatic macro-invertebrates for the biological assessment of river quality was carried out throughout the United Kingdom. This task was undertaken by the Environment Agency (the Agency) in England and Wales, the Scottish Environment Protection Agency (SEPA) in Scotland and the Industrial Research and Technology Unit (IRTU) undertook the work in Northern Ireland.

Each organisation employed standard collection procedures as used in the 1995 General Quality Assessment (GQA) Survey. The sampling strategy was therefore compatible with RIVPACS (River InVertebrate Prediction And Classification System), a computer model developed by the Institute of Freshwater Ecology (IFE). Samples were sorted for the families of macro-invertebrates included in the Biological Monitoring Working Party (BMWP) system. Taxa present were recorded on site data sheets. Although attempts had been made to standardise sample processing and recording techniques, these did vary somewhat from Region to Region.

In view of the number of staff involved and the variability of sample processing techniques, it was recognised that a quality assurance exercise was necessary to minimise and quantify errors. Each laboratory appointed at least one experienced analyst to act as an internal analytical quality control (AQC) inspector. These inspectors re-sorted 10% of the laboratory's samples, those samples chosen for re-sorting being selected randomly. In addition, IFE was contracted to undertake an independent, external audit of the quality of the laboratory analysis of biological samples for each Agency and SEPA region and for IRTU. This commission was consistent with the audit performed by IFE for the National River Quality Surveys in 1990 and 1995 and for the routine biological monitoring of river sites each year between 1991 and 1994. The audit for the Agency comprised two elements. The AQC audit provided a measure of the quality of performance of the AQC inspectors. The Primary Audit provided an independent assessment of the quality of the data, since this was not adjusted for errors identified by either of the other quality assurance procedures.

This report presents the results of the audit of 476 samples internally AQC'd by Agency staff. The results of the Primary Audit detailing the performance of the Agency's biologists who performed the primary analysis of 511 samples are reported separately (Gunn *et al.*, 1997).

2. SAMPLE SELECTION

Samples for audit were selected internally by each of the organisations being monitored. The method of selection used by the Agency is described in Environment Agency (1996). The number of samples selected for audit varied between laboratories and the biologists processing these samples had no prior knowledge of which samples were to be audited. Laboratories were instructed to send to IFE samples that had been processed twice (once for primary analysis and once for internal AQC inspection). Those which analysed an insufficient number of samples throughout the year to provide the requisite number of AQC-inspected samples for the audit sent as many AQC-inspected samples as they could and made up the number with samples which had been analysed just once. The manner of sample selection, which biologists would be monitored and the number of audit samples from each season, were left to the discretion of the agency, within the limits of the total number of samples that IFE was contracted to audit.

3. SAMPLE PROCESSING

The normal protocol for Agency, SEPA and IRTU biologists was to sort their samples within the laboratory and to select examples of each scoring taxon within the BMWP system. The invertebrates were placed in a vial of preservative (4% formaldehyde solution or 70% industrial alcohol) and the BMWP taxa were listed on a data sheet. The vial of animals and the sorted material were then returned to the sample container and preservative added. Samples for internal AQC analysis should have been sorted in the same manner as the primary analysis. The AQC inspector's task included confirming the identification of the contents of the vial and the correctness of the data sheet. Any additional taxa found at AQC were to be placed in a separate vial without altering the contents of the primary analyst's vial, although this instruction was not always followed.

Each sample available to IFE for audit should have included:

- i) a data sheet containing a list of the BMWP families found in the sample.
- ii) a vial or vials containing representatives from each family.
- iii) the preserved sample.

When these three elements were present, the sequence of operations at IFE was as follows:

- a) The remainder of the sample was sorted, without reference to the data sheet or to the vials of animals, and the BMWP families identified.
- b) The families contained within the vials were identified.
- c) A comparison was made between the listing of families and those found in the sample by IFE.
- d) A comparison was made between the listing of families and those identified from the vials by IFE.
- e) "Losses" or "gains" from the original listing of families were noted. In the case of "gains", each additional family was identified, where possible, to species level, in order to clarify any specific repetitive errors. Single representatives of a "gained" taxon were noted as such.
- f) An error code, selected from a list on the result sheet, was assigned by the IFE auditor for each "loss" or "gain".

Occasionally a sample did not include a vial containing representative examples of the families listed on the data sheet, while some arrived with the vial damaged in transit such that the representative specimens were no longer separated. For these samples, only operations a), c), e) and f) above were appropriate.

Several directives were issued to IFE relating to the treatment of BMWP taxa. Every taxon recorded on the data sheet must be supported by a voucher specimen of that family in the vial (or, for very large specimens, left in the sample). The only exceptions to this rule were the native crayfish, *Austropotamobius pallipes*, the medicinal leech, *Hirudo medicinalis* and the pearl mussel, *Margaritifera margaritifera* (which does not belong to a BMWP family), all of which are protected species. Where possible, IFE gave the benefit of doubt to the analyst in cases of the "loss" of Planariidae, specimens of which have been known to disintegrate in preservative. Animals deemed to have been dead at the time of sampling, cast insect skins, pupal exuviae and empty mollusc shells were to be excluded from the listing of families present. Isolated posterior ends of "living"

specimens were not acceptable as records of a taxon. In these cases, thorax plus abdomen was deemed acceptable but abdomen only was deemed unacceptable. Terrestrial representatives of BMWP scoring families were also to be excluded from the audit. For this reason, Clambidae, Chrysomelidae and Curculionidae, which appear in the BMWP list, were excluded for the purposes of the audit since most representatives of these families are, at best, only semi-aquatic. Trichopteran pupae, although not routinely identified by many biologists, were to be included in the listing of families.

4. REPORTING

The results of each sample audit were recorded on a standard report form and sent to the appropriate Regional Biologist. Examples for Primary and AQC Audits of the same site are shown in Figures 1 & 2. IFE were instructed not to include copies of these forms in the report but that each region would keep their own forms as an appendix to this report. For audit samples where a vial of animals was included, the comparison between the listing of families and the taxa found in the vial by IFE was shown in the section of the report form headed "VIAL". Discrepancies could be due to carelessness, misidentifications or errors in completing the data sheet listing the families present. Families not on the listing but found by IFE in the remainder of the sample were entered in the section of the report form headed "SAMPLE" under "Additional BMWP taxa found by IFE". This section also included taxa added by the internal AQC analyst. Taxa recorded here represent families missed by the analyst(s) on sorting the sample. When the families listed as "losses" in the first section of the report form were compared with the full list of families recorded in the sample by IFE, some apparent losses from the vial were offset by the presence of those families in the remainder of the sample. These taxa were therefore listed both as "losses" from the vial and as "gains" from the sample and were neither a net loss nor a net gain. In these cases, the families were marked with an asterisk in both boxes. Such errors are noted as "omissions".

Species identifications, state of development (eg adult or larval coleopterans) and the presence of a single representative of a family within the remainder of the sample were recorded in the centre section of the report form under "species name".

IFE was asked to interpret each error to provide a possible cause. An error code, selected from a list of options at the foot of each result sheet, was entered against each taxon in the column headed "Presumed cause of error".

For those samples in which the vial of animals was damaged or missing, the "VIAL" sections of the report form were not applicable (N/a). Families not on the list but present in the sample were entered in the section under "SAMPLE" : "Additional taxa" as before. Families recorded on the list but not found by IFE were indicated in the section above this. If the vial of animals was retained by the sorter, entries in this box could include the sole representative of a family which was removed, a family seen at the site which escaped or was released (without mention being made on the data sheet), inaccurate identification or the wrong family box being ticked on the data sheet.

The final section of the result sheet summarises the audit, giving details of the numbers of "losses", "gains" and "omissions", together with the net effects on BMWP score and the number of scoring taxa.

Figure 1. An example of a Primary Audit result sheet

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Example	LABORATORY: Wareham	DATE: 1.3.96
WATER-COURSE: Beautiful River	PRIMARY ANALYST: XX	AQC ANALYST: YY
SITE: Utopia	CODE: 0001/AQC01	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found by IFE

Planorbidae	12
Terrestrial snail in vial	
Baetidae *	1
Limnephilidae	7

Additional BMWP taxa found by IFE

Lepidostomatidae	7
Lepidostoma hirtum (Fabricius)	

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae *	1
Baetis rhodani (Pictet)	
Hydrophilidae (incl. Hydraenidae)	9
Hydraena gracilis Germar (a) 1 only	
Hydroptilidae	11
Hydroptila sp. (p) 1 only	
Psychomyiidae (incl. Ecnomidae)	11
Psychomyia pusilla (Fabricius)	

SUMMARY OF AUDIT

LOSSES 2

GAINS 4

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 19

ON NO. OF TAXA 2

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

Figure 2. An example of an AQC Audit result sheet

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: Example	LABORATORY: Wareham	DATE: 1.3.96
WATER-COURSE: Beautiful River	PRIMARY ANALYST: XX	AQC ANALYST: YY
SITE: Utopia	CODE: 0001/AQC01	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF AQC AUDIT

Family name	Presumed cause of error (see footnotes)
-------------	---

VIAL

BMWP taxa not found by IFE

Baetidae *	1
Limnephilidae	7

Additional BMWP taxa found by IFE

Lepidostomatidae	7
Lepidostoma hirtum (Fabricius)	

SAMPLE

BMWP taxa not found by IFE (For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Baetidae *	1
Baetis rhodani (Pictet)	
Hydrophilidae (incl. Hydraenidae)	9
Hydraena gracilis Germar (a) 1 only	

SUMMARY OF AUDIT

LOSSES 1

GAINS 2

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 1

- 1 No representative of family in vial
- 2 Alternative terrestrial specimen in vial
- 3 Posterior end only in vial
- 4 Empty shell or case or cast skin in vial

- 5 Specimen dead at time of sampling
- 6 Taxon in vial but not recorded
- 7 Mis-identification
- 8 Typographical error - wrong box ticked

- 9 Taxon missed in sorting
- 10 Unexplained error
- 11 Taxon added in internal AQC
- 12 Recorded taxon that was rejected by AQC analyst

Omission (*) = Recorded, not in vial but found by IFE in sample (no net loss or gain)

5. RESULTS

The results of the AQC Audit for all Agency regions are presented, Region by Region, in Tables 1 to 56. A summary of the basic audit results in terms of losses, gains and omissions is followed by the statistics of these regional audit results centered around the target of acceptability of no more than two missed taxa per sample. These data are presented for each AQC inspector, for their area laboratories and for the region as a whole. Then follows information on the net effects of the AQC Audit on the BMWP score and number of taxa for the Region's data. These results are again based on the target of no more than two missed taxa per sample. The figure of 13 for an acceptable underestimate of BMWP score is based on twice the average score of all taxa in the BMWP listing (excluding Clambidae, Chrysomelidae and Curculionidae, which are excluded from the audit). This average score is 6.57. Following this are listings for the Region of the taxa missed at family and species levels in the 1996 audit. Tables 57 and 58 summarise the statistics and effects of the AQC Audit for the whole of the Agency. Tables 59 and 60 give listings of all missed taxa at family and species levels for the whole of the Agency and Tables 61 and 62 give similar listings for the all samples audited in 1996 for the whole of the UK (Primary and AQC Audits for Agency Regions plus single Audit for other organisations). Data for the Primary Audit is presented in a separate report (Gunn *et al.*, 1997).

Estimating sample biases for the compare module of RIVPACS III+

The underestimation of the number of BMWP-scoring taxa present in a sample is termed bias for the purpose of the compare module of RIVPACS III+. An estimate of bias is provided by the net gains (number of gains minus number of losses) for the Primary Audit. Values are listed in the Primary Audit report (Gunn *et al.*, 1997) and can be used directly for RIVPACS. When basing bias on results from internal AQC inspections, it is necessary to add the net gains owing to errors made in AQC inspection to the net gains reported by the AQC. Errors made in AQC inspection for each laboratory, region and the Agency as a whole are listed in Table 58 in the column "mean net effect on no. of taxa". To estimate the bias over a different period to that covered by this audit, the value in Table 58 can still be used if the quality of AQC inspection is consistently good for the period under consideration (mean number of gains should be no more than 0.5, see Table 57). If the AQC inspection was of poor or varying quality, it is necessary to refer to the individual AQC Audit result sheets for individual audit samples. Note that estimates of bias should be based on the results of at least 20 audited samples. Further instructions are given in Clarke *et al.* (1997).

6. ACKNOWLEDGEMENTS

Grateful thanks to the Agency's project leader, John Murray-Bligh of Thames Region, who contributed to the development and implementation of improved methodology and who provided helpful advice throughout the period of the audit.

7. REFERENCES

Clarke, R.T, Cox R., Furse M.T., Wright J.F., and Moss D. (1997). RIVPACS III+ User Manual. R&D Technical Report E26. Bristol: The Environment Agency.

Environment Agency (1996). Procedure for quality assurance for RIVPACS macro-invertebrate samples analysed to the taxonomic level needed for the BMWP-score system. Draft version 0.3. Bristol: Environment Agency.

Gunn, R.J.M., Blackburn J.H., Winder J.M., Wright J.F. & Symes K.L. (1997). An audit of performance in the analysis of biological samples in 1996. Environment Agency: Primary Audit. Report to the Environment Agency. IFE Report Ref. No. RL/T04071R7/02

AUDIT OF ANGLIAN REGION'S AQC INSPECTORS

Table 1. The 19 AQC'd samples audited for the Central Area of Anglian Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Bury Brook	Road Culvert Bury	ABA	1	2	0
Old R. Nene	Pig Water Sluice, Yaxley	SEH	0	0	1
AUTUMN					
New River (Monks Lode)	100 Acre Farm Bridge	ABA	0	0	0
Silverstone Brook	A413 Bridge	ABA	0	1	1
Millbridge Brook	B1040 Bridge, Potton	LJS	0	0	0
Nar	Mileham	LJS	0	1	0
Sharnbrook	Rushden Road Bridge, Sharnbrook	LJS	1	1	0
Cut Off Channel	Eriswell Hall Bridge	LJS	0	0	0
Lark	Tollgate Bridge	LJS	1	1	0
Ten Mile River	Brandon Creek	LJS	0	0	0
Cam	Green Dragon F/bridge, Chesterton	SEH	0	1	0
Ouzel	Billington	SEH	0	0	0
Nar	West Lexham	SEH	0	3	1
Lark	Hengrave Bridge	SEH	0	2	0
Forty Foot	Forty Foot Bridge, Ramsey	SEH	0	0	0
Old Course Nene	Pig Water Sluice, Yaxley	SEH	0	1	0
Stringside Stream	White Bridge, Oxborough	SEH	0	1	0
Ouzel	A5 Old Bridge, Bletchley	WTC	0	1	0
Nene (Old Course)	Andrews Farm, March	WTC	0	2	1

Table 2. The 20 AQC'd samples audited for the Eastern Area of Anglian Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
R. Gipping	Station Road Bridge	CSA	0	0	0
Layer Brook	Brook Hall	CSA	0	0	1
Broome Beck	Longford Bridge	EDT	0	0	0
River Ter	Bumfords Bridge	JMG	0	0	0
R. Bure	Horning Ferry	JMG	1	3	0
AUTUMN					
Blackwater	Greys Mill	CSA	0	1	0
Chelmer	Langleys Bridge	CSA	1	0	0
Roxwell Brook	u/s Newlands Brook	CSA	0	1	0
Leiston Beck	Lovers Lane Bridge	CSA	0	2	0
Gipping	Quintons Mill	JHS	0	0	0
Stour	Boxted Mill	JHS	0	3	0
Yare	Bickerstone Bridge	JMG	0	0	0
Tud	Whitford Bridge	JMG	0	0	0
Wenhaston Watercourse	Blackheath Bridge	JMG	0	2	0
Lark	Gt Bealings Bridge	JMG	0	0	0
Witton Run	Bays Bridge	JMG	0	0	0
Bumpstead Brook	Watsoe Bridge	JMG	0	0	0
Waveney	Mendham Bridge	JMG	0	0	0
Holland Brook	Holland Main Road Bridge	JMG	0	0	0
Tenpenny Brook	Footbridge East of Stable Wood	JMG	0	0	0

Table 3. The 20 AQC'd samples audited for the Northern Area of Anglian Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
G.U.C.	Blisworth	CAE	0	1	0
Kyme Eau	South Kyme	DMB	0	1	0
R. Welland	Crowland Bridge	RPC	0	1	0
Waithe Beck	Tetney	SJH	0	1	0
Waithe Beck	A1031	SJH	0	1	0
AUTUMN					
Glen	Kates Bridge	CAE	0	0	0
Welland	Deeping	DMB	0	1	0
Willow Brook South	A427	DMB	0	0	1
South Drove Drain	Laws Farm	DMB	0	1	0
Chater	North Luffenham	RPC	0	0	0
Fosdyke Canal	Pywipe	RPC	0	4	0
Horncastle Canal	Wharf Lane	RPC	0	1	1
Lower Witham	Langrick Bridge	RPC	0	1	0
New Cut Drain	Pyewipe Pumping Station	RPC	0	0	0
Lacey Beck	Stud Farm	RPC	0	0	0
Woldgrift Drain	Old Railway Bridge	SJH	0	1	0
Old Ancholme	Wrawby	SJH	0	1	0
Grove Farm Feeder Stream	Ashby St Ledgers Ford	SJH	0	0	0
Waithe Beck	A1031	SJH	0	1	0
Land Drain	Saxby Carrs	SJH	0	0	0

Table 4. Statistics of the 1996 AQC Audit results for Anglian Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Central	19	0.89	0.20	1	5.26	3	1.26	0.27
ABA	3	1.00	0.58	0	0.00	2	1.67	0.88
LJS	6	0.50	0.22	0	0.00	1	0.83	0.40
SEH	8	1.00	0.38	1	12.50	3	1.25	0.45
WTC	2	1.50	0.50	0	0.00	2	2.00	1.00
Eastern	20	0.60	0.23	2	10.00	3	0.75	0.26
CSA	6	0.67	0.33	0	0.00	2	1.00	0.26
EDT	1	0.00	n/a	0	0.00	0	0.00	n/a
JHS	2	1.50	1.50	1	50.00	3	1.50	1.50
JMG	11	0.45	0.31	1	9.09	3	0.55	0.39
Northern	20	0.80	0.20	1	5.00	4	0.90	0.20
CAE	2	0.50	0.50	0	0.00	1	0.50	0.50
DMB	4	0.75	0.25	0	0.00	1	1.00	0.00
RPC	7	1.00	0.53	1	14.29	4	1.14	0.55
SJH	7	0.71	0.18	0	0.00	1	0.71	0.18
Anglian Region	59	0.76	0.12	4	6.78	4	0.97	0.14

Table 5. Net effects of the AQC Audit on BMWP score and number of scoring taxa for Anglian Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Central	19	3.68	5.26	23	0.74	5.26	3
ABA	3	4.00	0.00	6	0.67	0.00	1
LJS	6	-0.17	0.00	5	0.17	0.00	1
SEH	8	5.25	12.50	23	1.00	12.50	3
WTC	2	8.50	0.00	11	1.50	0.00	2
Eastern	20	2.40	5.00	17	0.50	5.00	3
CSA	6	2.33	0.00	8	0.50	0.00	2
EDT	1	0.00	0.00	0	0.00	0.00	0
JHS	2	8.50	50.00	17	1.50	50.00	3
JMG	11	1.55	0.00	11	0.36	0.00	2
Northern	20	4.15	5.00	23	0.80	5.00	4
CAE	2	1.50	0.00	3	0.50	0.00	1
DMB	4	3.75	0.00	5	0.75	0.00	1
RPC	7	5.86	14.29	23	1.00	14.29	4
SJH	7	3.43	0.00	6	0.71	0.00	1
Anglian Region	59	3.41	5.08	23	0.68	5.08	4

Table 6 The families missed by Anglian Region's AQC inspectors

Family	n	% of Anglian Region's missed taxa in AQC Audit
Hydroptilidae	4	9.52
Elmidae	4	9.52
Planariidae (incl. Dugesiidae)	3	7.14
Glossiphoniidae	3	7.14
Hydrobiidae (incl. Bithyniidae)	3	7.14
Tipulidae	2	4.76
Corophiidae	2	4.76
Lymnaeidae	2	4.76
Leptoceridae	2	4.76
Valvatidae	2	4.76
Haliplidae	2	4.76
Ancylidae (incl. Acroloxidae)	2	4.76
Coenagriidae	1	2.38
Corixidae	1	2.38
Dendrocoelidae	1	2.38
Hydropsychidae	1	2.38
Notonectidae	1	2.38
Physidae	1	2.38
Polycentropodidae	1	2.38
Psychomyiidae (incl. Ecnomidae)	1	2.38
Simuliidae	1	2.38
Sphaeriidae	1	2.38
Hydrophilidae (incl. Hydraenidae)	1	2.38
TOTAL	42	100.00

Table 7 The species missed by Anglian Region's AQC inspectors

Species	n	% of Anglian Region's missed species in AQC Audit
<i>Hydroptila</i> sp.	3	6.98
<i>Helobdella stagnalis</i> (L.)	3	6.98
<i>Potamopyrgus jenkinsi</i> (Smith)	3	6.98
<i>Polycelis nigra/tenuis</i>	2	4.65
<i>Ancylus fluviatilis</i> Muller	2	4.65
<i>Elmis aenea</i> (Muller)	2	4.65
<i>Lymnaea</i> sp.	2	4.65
<i>Valvata cristata</i> Muller	2	4.65
<i>Haliphus</i> sp.	2	4.65
<i>Dugesia tigrina</i> (Girard)	1	2.33
<i>Dendrocoelum lacteum</i> (Muller)	1	2.33
<i>Corophium multisetosum</i> Stock	1	2.33
<i>Corophium curvispinum</i> Sars	1	2.33
<i>Athripsodes aterrimus</i> (Stephens)	1	2.33
<i>Hydropsyche</i> sp.	1	2.33
<i>Ischnura elegans</i> (Van der Linden)	1	2.33
<i>Laccobius</i> sp.	1	2.33
<i>Notonecta</i> sp.	1	2.33
<i>Valvata piscinalis</i> (Muller)	1	2.33
<i>Oulimnius major</i> (Rey)	1	2.33
<i>Oulimnius</i> sp.	1	2.33
<i>Oxyethira</i> sp.	1	2.33
<i>Physa fontinalis</i> (L.)	1	2.33
<i>Pilaria</i> (<i>Pilaria</i>) sp.	1	2.33
<i>Pilaria</i> sp.	1	2.33
<i>Polycentropus flavomaculatus</i> (Pictet)	1	2.33
<i>Sigara</i> (<i>Subsigara</i>) <i>falleni</i> (Fieber)	1	2.33
<i>Simulium</i> (<i>Nevermannia</i>) <i>angustitarse</i> group	1	2.33
<i>Sphaeriidae</i> indet	1	2.33
<i>Tinodes waeneri</i> (L.)	1	2.33
<i>Mystacides nigra/longicornis</i>	1	2.33
TOTAL	43	100.00

AUDIT OF MIDLANDS REGION'S AQC INSPECTORS

Table 8. The 20 AQC'd samples audited for the Upper Severn Area of Midland Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Spadesbourne Brook	The Strand	ADG	0	1	0
Tem	Knucklas	ADG	0	2	0
Beanhill	Wrockwardine	ADG	0	0	0
Black Brook	Pedimore	ADG	1	0	0
Mad Brook	Halesfield	ADG	1	0	0
Stour	Maypole Hill	ADG	0	0	0
Minsterley Brook	Malchurst	ADG	0	1	0
Tetchill Brook	Tetchill	ADG	0	0	0
Blore	A53 Bridge	ADG	0	0	0
Iwrch	Pont Mad Mochnant	ADG	0	3	0
SUMMER					
Stour	Wilden	ADG	0	0	0
Tern	Shiffords Bridge	ADG	0	3	0
AUTUMN					
Hoo Brook	u/s Kidderminster	ADG	0	1	0
Salwarpe	Mildenhall Mill	ADG	0	1	0
Stour	Hayseech	ADG	0	0	0
Tern	Waters Upton	ADG	1	3	0
Albrighton Brook	A464	ADG	0	0	0
Quinny Brook	u/s Church Stretton STW	ADG	0	0	0
Cain	Hafo Dinnas	ADG	0	0	0
Gallows Brook	u/s Hagley STW	ADG	2	0	0

Table 9. The 20 AQC'd samples audited for the Lower Severn Area of Midland Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Badsey Brook	d/s Childswickham	ADC	0	1	0
Cinderford Brook	Lower Soudley	ADC	0	4	0
Gog Brook	Stratford Road	ADC	0	2	0
Carrant Brook	Tewkesbury	ADC	0	1	0
Avon	Hampton Lucy	ADC	0	2	1
Chelt	Withy Bridge	HJW	1	0	0
Hatherley Brook	The Elms, Twigworth	HJW	0	4	0
Bow Brook	u/s Priest Bridge WRW	HJW	0	1	0
Radford Brook	A425 Bridge, Radford Semele	HJW	0	0	0
Leadon	Ross Road Bridge	HJW	0	0	0
AUTUMN					
Severn	Hawbridge	HJW	0	1	0
Washbourne Brook	Little Washbourne	HJW	0	1	0
Leam	u/s Braunston STW	HJW	0	1	0
Leadon	Elm Bridge	HJW	0	0	0
Sherbourne	Spon End	HJW	0	0	0
Coaley Brook	Cam confluence	HJW	0	1	0
Smite Brook	d/s Monks Kirby STW	HJW	0	0	0
Withy Brook	High Bridge	HJW	0	0	0
Cannop Brook	Lydney Harbour	HJW	0	0	0
Badsey Brook	Offenham	HJW	0	0	0

Table 10. The 20 AQC'd samples audited for the Upper Trent Area of Midland Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Hilton Brook	Hilton	GF	0	1	0
Gayton Brook	Weston	GF	0	1	0
Carlton Brook	Carlton	GF	0	1	0
Gilwiskaw Brook	d/s Northern Dairies	GF	0	0	0
Harlaston Brook	Harlaston	GF	0	1	0
Marston Brook	Brocksford	GF	0	1	0
Rolleston Brook	d/s WRW	GF	0	2	0
SUMMER					
Rea	Kitchener Road	GF	0	0	0
Brindley Brook	u/s Mine	GF	0	1	0
Snibston Brook	Confluence	GF	0	3	0
Dog Lane Brook	Heart of England Way	GF	0	1	0
AUTUMN					
Blythe	Packington Ford	GF	0	2	0
Ditch/Blithe Tributary	u/s Railway, u/s pollution	GF	0	3	0
Tean	Brookhouses	GF	0	0	0
Bramborough Brook	d/s Donisthorpe	GF	0	4	0
Manifold	Hulme End	GF	0	0	0
Doxey Brook	Doxey	GF	0	1	0
Scotch Brook	Stone	GF	0	0	0
Brindley Brook	u/s Mine discharge	GF	0	1	0
Penk	Cuttlestone Bridge	GF	0	0	0

Table 11. The 20 AQC'd samples audited for the Lower Trent Area of Midland Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Westmeadow Brook	Long Whatton	PS	0	1	0
Twyford Brook	d/s Findern WRW	PS	0	0	0
Willoughton Brook	Willoughton	PS	0	1	0
Noe	u/s Edale WRW	PS	0	1	0
Wye	Millers Dale	PS	0	0	0
Alfreton Brook	Ford Bridge Lane	PS	0	0	0
SUMMER					
Soar	Birstall	PS	0	1	0
Greet	Kirklington	PS	1	0	0
Rothley Brook	Thornton	PS	0	0	0
Grimmer	Granby	PS	0	0	0
Stanley Brook	u/s Midlands Storage	PS	0	1	0
Catchwater Drain	South Leverton	PS	0	2	0
AUTUMN					
Maun	Edwinstowe	PS	0	2	0
Bottesford Brook	Brigg Road	PS	0	0	0
Heage Brook	Ambergate	PS	0	2	0
Broughton Astley Brook	Croft	PS	0	2	0
Carr Dyke	Trent confluence	PS	1	4	0
Torne	Goole Bridge, Tickhill	PS	0	2	1
Devon	Wensor Bridge	PS	1	0	0
Peakshole Water	Hope	PS	0	0	0

Table 12. Statistics of the 1996 AQC Audit results for Midland Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Upper Severn	20	0.75	0.25	3	15.00	3	1.00	0.27
ADG	20	0.75	0.25	3	15.00	3	1.00	0.27
Lower Severn	20	0.95	0.28	2	10.00	4	1.05	0.29
ADC	5	2.00	0.55	1	20.00	4	2.20	0.58
HJW	15	0.60	0.27	1	6.67	4	0.67	0.27
Upper Trent	20	1.15	0.25	3	15.00	4	1.15	0.25
GF	20	1.15	0.25	3	15.00	4	1.15	0.25
Lower Trent	20	0.95	0.25	1	5.00	4	1.15	0.28
PS	20	0.95	0.25	1	5.00	4	1.15	0.28
Midlands Region	80	0.95	0.13	9	11.25	4	1.09	0.13

Table 13. Net effects of the AQC Audit on BMWP score and number of scoring taxa for Midland Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Upper Severn	20	3.50	20.00	20	0.50	10.00	3
ADG	20	3.50	20.00	20	0.50	10.00	3
Lower Severn	20	4.65	10.00	25	0.90	10.00	4
ADC	5	10.40	20.00	25	2.00	20.00	4
HJW	15	2.73	6.67	20	0.53	6.67	4
Upper Trent	20	6.00	5.00	27	1.15	15.00	4
GF	20	6.00	5.00	27	1.15	15.00	4
Lower Trent	20	4.85	10.00	20	0.80	5.00	3
PS	20	4.85	10.00	20	0.80	5.00	3
Midlands Region	80	4.75	11.25	27	0.84	10.00	4

Table 14 The families missed by Midland Region's AQC inspectors

Family	n	% of Midlands Region's missed taxa in AQC Audit
Simuliidae	6	8.57
Hydrobiidae (incl. Bithyniidae)	6	8.57
Planorbidae	5	7.14
Elmidae	4	5.71
Halplidae	4	5.71
Planariidae (incl. Dugesiidae)	3	4.29
Asellidae	3	4.29
Hydroptilidae	3	4.29
Physidae	2	2.86
Hydrophilidae (incl. Hydraenidae)	2	2.86
Limnephilidae	2	2.86
Polycentropodidae	2	2.86
Psychomyiidae (incl. Ecnomidae)	2	2.86
Coenagriidae	2	2.86
Tipulidae	2	2.86
Rhyacophilidae (incl. Glossosomatidae)	1	1.43
Valvatidae	1	1.43
Oligochaeta	1	1.43
Nemouridae	1	1.43
Lymnaeidae	1	1.43
Leuctridae	1	1.43
Scirtidae	1	1.43
Calopterygidae	1	1.43
Lepidostomatidae	1	1.43
Leptophlebiidae	1	1.43
Caenidae	1	1.43
Chironomidae	1	1.43
Ephemeridae	1	1.43
Erpobdellidae	1	1.43
Gammaridae (incl. Crangonyctidae)	1	1.43
Ancylidae (incl. Acroloxidae)	1	1.43
Gyrinidae	1	1.43
Heptageniidae	1	1.43
Hydropsychidae	1	1.43
Leptoceridae	1	1.43
Goeridae	1	1.43
Baetidae	1	1.43
TOTAL	70	100.00

Table 15 The species missed by Midland Region's AQC inspectors

Species	n	% of Midlands Region's missed species in AQC Audit
Potamopyrgus jenkinsi (Smith)	6	8.45
Simulium (Simulium) ornatum group	4	5.63
Gyraulus albus (Muller)	3	4.23
Asellus aquaticus (L.)	3	4.23
Elmis aenea (Muller)	3	4.23
Physa acuta/heterostropha	2	2.82
Polycelis nigra/tenuis	2	2.82
Haliphus sp.	2	2.82
Ischnura elegans (Van der Linden)	2	2.82
Hydroptila sp.	2	2.82
Tinodes waeneri (L.)	2	2.82
Armiger crista (L.)	2	2.82
Orthoclaadiinae	1	1.41
Oulimnius sp.	1	1.41
Oxyethira sp.	1	1.41
Nemurella picteti Klapalek	1	1.41
Plectrocnemia conspersa (Curtis)	1	1.41
Orectochilus villosus (Muller)	1	1.41
Polycelis felina (Dalyell)	1	1.41
Polycentropus flavomaculatus (Pictet)	1	1.41
Rhyacophila dorsalis (Curtis)	1	1.41
Silo sp.	1	1.41
Simulium (Eusimulium) aureum group	1	1.41
Simulium (Simulium) reptans (L.)	1	1.41
Tanytarsini	1	1.41
Valvata cristata Muller	1	1.41
Lymnaea peregra (Muller)	1	1.41
Tubificidae	1	1.41
Calopteryx sp.	1	1.41
Hydropsyche siltalai Dohler	1	1.41
Limnophila (Eloeophila) sp.	1	1.41
Athripsodes bilineatus (L.)	1	1.41
Austrolimnophila sp.	1	1.41
Caenis luctuosa/macrura	1	1.41
Ecdyonurus sp.	1	1.41
Elodes sp.	1	1.41
Ephemera sp.	1	1.41
Erpobdella octoculata (L.)	1	1.41
Gammarus pulex (L.)	1	1.41
Leuctra fusca (L.)	1	1.41
Baetis rhodani (Pictet)	1	1.41
Limnephilidae indet	1	1.41
Habrophlebia fusca (Curtis)	1	1.41
Lepidostoma hirtum (Fabricius)	1	1.41
Ancylus fluviatilis Muller	1	1.41
Hydraena riparia	1	1.41
Helophorus flavipes/obscurus	1	1.41
Haliphus lineatocollis (Marshall)	1	1.41
Haliplidae indet	1	1.41
Halesus digitatus/radiatus	1	1.41
TOTAL	71	100.00

AUDIT OF NORTH EAST REGION'S AQC INSPECTORS

Table 16. The 20 AQC'd samples audited for the Dales Area of North East Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Nidd	Holme Bottom	EA	0	0	0
Burn	Gollinglith Foot	EA	0	1	0
Hebden Beck	u/s Hebden Bridge	EA	0	1	0
Cover	Middleham	EA	0	0	0
Derwent	Forge Valley	EA	0	0	0
Skelton Beck	Tockett's Bridge	EA	0	0	0
Derwent	Low Hutton	GJB	0	3	0
Ure	Wensley	GJB	0	1	0
Skerne	John Street	GJB	0	1	0
SUMMER					
Swale	Skipton-on-Swale	EA	0	0	0
Tees	Holwick Head	EA	0	6	0
Ure	Wensley	GJB	0	1	0
AUTUMN					
Burn	Gollinglith Foot	EA	0	0	1
Esk	Lealholm	EA	0	1	0
Wharfe	Ilkley	EA	0	1	0
Wharfe	Burnsall	EA	0	0	0
Wharfe	Boston Spa	EA	0	2	0
Costa Beck	Kirby Misperton	EA	1	1	1
Pickering Beck	Pickering	EA	0	4	0
Balder	Cotherstone	GJB	1	2	0

Table 17. The 19 AQC'd samples audited for the Northumbria Area of North East Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
North Tyne	Kielder viaduct	JH	0	0	0
Elsdon Burn	Soppit	JH	0	1	0
SUMMER					
Stagshaw Burn	Halton 1	JH	0	0	0
Blyth	Bedlington	JH	0	0	0
Gaunless	Butterknowle	VW	0	0	0
AUTUMN					
Seaton Burn	6 u/s	EC	2	0	1
Seaton Burn	Holywell Dean	EC	0	0	0
Seaton Burn	Melrose Ave	EC	0	0	0
Seaton Burn	Fordley Estate	EC	0	0	0
Devils Water	Dilston	EC	0	2	0
Stanley Burn	d/s Memorial Park	JH	1	0	0
Hindon Beck	Woolly Hill 1	JH	0	0	0
Stagshaw Burn	Halton 3	JH	0	0	0
Tipalt Burn	d/s Wrytrees	JH	0	1	0
Nent	Alston	JH	0	0	0
Aln	Hawkhill	JH	0	1	0
Lumley Park Burn	Lumley Castle	VW	0	0	0
Valley Burn	Tudhoe Mill	VW	0	0	0
Gaunless	u/s R. Wear confluence	VW	0	0	0

Table 18. The 20 AQC'd samples audited for the Ridings Area of North East Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Aire	Saltaire	JB	0	0	0
Sheaf	Queens Road	JB	0	1	1
Aire	Bellbusk Road	RJJ	0	0	0
Otterburn Beck	d/s Bell Busk STW - Trout Farm	RJJ	0	1	0
Calder	Wakefield	RJJ	0	0	0
Calder	Mirfield	RJJ	0	0	0
Greaseborough Dike	B6089	VH	0	0	0
Worth	Providence Lane	VH	0	1	1
SUMMER					
Cudworth Dike	u/s CSO	JB	0	2	0
Ryburn	u/s Booth Dean Clough	RJJ	0	0	0
AUTUMN					
Porter Brook	u/s Forge Dam (d/s Ochre limit)	IH	0	0	0
Leeshaw Beck	Further d/s Leeshaw Reservoir	JB	1	2	0
Turvin Clough	u/s Elphin Brook	JB	0	0	0
Kearsley Brook	u/s Don confluence	JB	0	3	1
Cubley Brook	Gledhill Avenue	JB	0	0	0
Thurnscoe Dike	u/s Derry Grove Dike	JB	0	2	0
Hipper	Haddon Close	RJJ	0	1	0
Hebden Water	Hebden Bridge	VH	0	1	0
Shepley Dike	Brook Bridge (u/s Ochre limit)	VH	0	1	0
Carr Dike	u/s Billingley Bridge	VH	1	1	0

Table 19. Statistics of the 1996 AQC Audit results for North East Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (1+g+o)	Standard error
Dales	20	1.25	0.35	3	15.00	6	1.45	0.36
EA	15	1.13	0.45	2	13.33	6	1.33	0.45
GJB	5	1.60	0.40	1	20.00	3	1.80	0.49
Northumbria	19	0.26	0.13	0	0.00	2	0.47	0.19
EC	5	0.40	0.40	0	0.00	2	1.00	0.63
JH	10	0.30	0.15	0	0.00	1	0.40	0.16
VW	4	0.00	0.00	0	0.00	0	0.00	0.00
Ridings	20	0.80	0.20	1	5.00	3	1.05	0.27
IH	1	0.00	n/a	0	0.00	0	0.00	n/a
JB	8	1.25	0.41	1	12.50	3	1.63	0.53
RJJ	6	0.33	0.21	0	0.00	1	0.33	0.21
VH	5	0.80	0.20	0	0.00	1	1.20	0.37
North East Region	59	0.78	0.15	4	6.78	6	1.00	0.17

Table 20. Net effects of the AQC Audit on BMWP score and number of scoring taxa for North East Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Dales	20	7.65	15.00	44	1.15	15.00	6
EA	15	7.73	20.00	44	1.07	13.33	6
GJB	5	7.40	0.00	13	1.40	20.00	3
Northumbria	19	1.21	5.26	17	0.11	0.00	2
EC	5	1.40	20.00	17	0.00	0.00	2
JH	10	1.60	0.00	10	0.20	0.00	1
VW	4	0.00	0.00	0	0.00	0.00	0
Ridings	20	4.00	0.00	13	0.70	5.00	3
IH	1	0.00	0.00	0	0.00	0.00	0
JB	8	5.50	0.00	13	1.13	12.50	3
RJJ	6	2.17	0.00	10	0.33	0.00	1
VH	5	4.60	0.00	10	0.60	0.00	1
North East Region	59	4.34	6.78	44	0.66	6.78	6

Table 21 The families missed by North East Region's AQC inspectors

Family	n	% of North East Region's missed taxa in AQC Audit
Hydroptilidae	3	6.98
Limnephilidae	3	6.98
Nemouridae	3	6.98
Leptoceridae	2	4.65
Taeniopterygidae	2	4.65
Haliplidae	2	4.65
Chloroperlidae	2	4.65
Hydrophilidae (incl. Hydraenidae)	2	4.65
Hydropsychidae	2	4.65
Psychomyiidae (incl. Ecnomidae)	2	4.65
Caenidae	2	4.65
Physidae	2	4.65
Elmidae	2	4.65
Odontoceridae	1	2.33
Sphaeriidae	1	2.33
Scirtidae	1	2.33
Sericostomatidae	1	2.33
Heptageniidae	1	2.33
Tipulidae	1	2.33
Brachycentridae	1	2.33
Chironomidae	1	2.33
Coenagriidae	1	2.33
Erpobdellidae	1	2.33
Glossiphoniidae	1	2.33
Goeridae	1	2.33
Hirudinidae	1	2.33
Hydrobiidae (incl. Bithyniidae)	1	2.33
TOTAL	43	100.00

Table 22 The species missed by North East Region's AQC inspectors

Species	n	% of North East Region's missed species in AQC Audit
<i>Elmis aenea</i> (Muller)	2	4.44
<i>Haliplus</i> sp.	2	4.44
<i>Mystacides azurea</i> (L.)	2	4.44
<i>Ithytrichia</i> sp.	2	4.44
<i>Taeniopteryx nebulosa</i> (L.)	2	4.44
<i>Hydraena gracilis</i> Germar	2	4.44
<i>Protonemura meyeri</i> (Pictet)	2	4.44
<i>Chloroperla torrentium</i> (Pictet)	2	4.44
<i>Protonemura</i> sp.	1	2.22
Orthoclaadiinae	1	2.22
<i>Haemopsis sanguisuga</i> (L.)	1	2.22
<i>Physa fontinalis</i> (L.)	1	2.22
<i>Physa</i> sp.	1	2.22
<i>Pilaria</i> (<i>Pilaria</i>) sp.	1	2.22
<i>Ecdyonurus</i> sp.	1	2.22
<i>Brachycentrus subnubilus</i> Curtis	1	2.22
<i>Odontocerum albicorne</i> (Scopoli)	1	2.22
<i>Psychomyia pusilla</i> (Fabricius)	1	2.22
<i>Sericostoma personatum</i> (Spence)	1	2.22
<i>Silo pallipes</i> (Fabricius)	1	2.22
Sphaeriidae indet	1	2.22
<i>Trocheta</i> sp.	1	2.22
<i>Tinodes waeneri</i> (L.)	1	2.22
<i>Potamopyrgus jenkinsi</i> (Smith)	1	2.22
<i>Hydroptila</i> sp.	1	2.22
<i>Elodes</i> sp.	1	2.22
Glossiphoniidae indet	1	2.22
<i>Drusus annulatus</i> / <i>Ecclisopteryx guttulata</i>	1	2.22
<i>Dicranota</i> sp.	1	2.22
<i>Hydropsyche</i> sp.	1	2.22
<i>Nemoura avicularis</i> Morton	1	2.22
<i>Ischnura elegans</i> (Van der Linden)	1	2.22
<i>Caenis rivulorum</i> Eaton	1	2.22
Limnephilidae indet	1	2.22
<i>Limnephilus extricatus</i> McLachlan	1	2.22
<i>Caenis horaria</i> (L.)	1	2.22
<i>Hydropsyche siltalai</i> Dohler	1	2.22
TOTAL	45	100.00

AUDIT OF NORTH WEST REGION'S AQC INSPECTORS

Table 23. The 13 AQC'd samples audited for the Central Area of North West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Hyndburn	ptc Hyndburn Brook	AM	0	0	0
Barley Water	ptc Pendle Water	AM	0	0	0
Hyndburn	ptc Hyndburn Brook	AM	0	0	0
Woodplumpton Brook	ptc Barton Brook	AM	0	1	0
Norden Brook	ptc R.Hyndburn	EIG	1	1	0
Sparging Brook	Barton Old Farm	EIG	0	1	0
Roddlesworth	d/s Star Mill	EIG	1	0	1
Sparging Brook	Barton Old Farm	EIG	1	3	0
Main Dyke	Preese Hall	JAW	2	1	0
AUTUMN					
Cam Beck	ptc Gayle Beck	AM	0	1	0
Alt	Railway Bridge, Formby	JAW	0	0	0
Longton Brook	ptc R.Douglas	JAW	0	0	0
Hindburn	ptc R.Wenning	JAW	1	3	0

Table 24. The 20 AQC'd samples audited for the Northern Area of North West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Calder	Near Sellafield	AJ	0	1	0
Lostrigg Beck	Bridgefoot	AJ	1	0	0
Crooks Beck	ptc Lowgill Beck	AJ	0	1	0
Cumwhitton Beck	NY 500 528	AJ	1	2	0
Brunstock Beck	ptc R.Eden	AJ	0	1	1
Kinmont Beck	Near Bootle	NC	0	0	0
Brathay	Clappersgate	NC	0	5	1
Winster	Bowland Bridge	NC	1	0	0
SUMMER					
Ellergill Beck	NX 9955 0768	AJ	0	0	0
Summerground Gill	NY 442 309	AJ	0	1	0
Esk	Longtown Bridge	NC	0	2	0
Eamont	A66 Bridge	NC	1	4	0
AUTUMN					
Yewdale Beck	ptc Yew Tree Beck	AJ	0	0	1
Colton Beck	Colton Beck Bridge	AJ	1	1	0
Torver Beck	ptc Coniston Water	AJ	2	0	0
Bleng	us/ Mill Race outlet	NC	1	1	0
Silecroft Beck	ptc Whicham Beck	NC	0	0	0
Pow Beck	NY 247 237	NC	0	1	1
Dacre Beck	NY 478 267	NC	0	2	0
Eamont	Pooley Bridge	NC	0	1	0

Table 25. The 20 AQC'd samples audited for the Southern Area of North West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Croco	Sproston Hall	AG	0	3	0
Gowy	Huxley Bridge	AG	0	2	0
Oldhouse Brook	ptc Naden Brook	AG	0	3	0
Eagley Brook	u/s Charles Turner	AG	0	7	0
Ash Brook	ptc R.Roch	AG	0	3	0
Ditton Brook	ptc Halewood Brook	AG	0	0	0
Wheelock	Warmingham	AG	0	1	0
Valley Brook	Radway	AG	0	1	0
Wince Brook	ptc R.Irk	DGH	0	0	0
Blackshaw Brook	ptc R.Croal	DGH	0	3	0
Gowy	Gowy Bridge	DGH	0	0	0
Shelf Brook	u/s Super Alloys	LM	0	0	0
Tame	Wellihole Bridge	LM	0	0	3
Wistaston Brook	Wistaston Green	LM	0	0	0
Clatter Brook	ptc Thornton Stream	TP	0	1	0
Captains Clough	Cunliffe Brow	TP	1	1	0
Guy Lane Brook	ptc R.Gowy	TP	0	2	0
SUMMER					
Sankey Brook	u/s A57	AG	0	1	0
Gowy	Gowy Bridge	AG	2	1	0
Ogden	ptc Swinnel Brook	LM	0	4	0

Table 26. Statistics of the 1996 AQC Audit results for North West Region

Analyst/Group	n	Mean gains	Standard error	No.sample s >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Central	13	0.85	0.30	2	15.38	3	1.38	0.42
AM	5	0.40	0.24	0	0.00	1	0.40	0.24
EIG	4	1.25	0.63	1	25.00	3	2.25	0.63
JAW	4	1.00	0.71	1	25.00	3	1.75	1.03
Northern	20	1.15	0.30	2	10.00	5	1.75	0.34
AJ	10	0.70	0.21	0	0.00	2	1.40	0.27
NC	10	1.60	0.54	2	20.00	5	2.10	0.62
Southern	20	1.65	0.40	6	30.00	7	1.95	0.39
AG	10	2.20	0.63	4	40.00	7	2.40	0.62
DGH	3	1.00	1.00	1	33.33	3	1.00	1.00
LM	4	1.00	1.00	1	25.00	4	1.75	1.03
TP	3	1.33	0.33	0	0.00	2	1.67	0.33
North West Region	53	1.26	0.20	10	18.87	7	1.74	0.22

Table 27. Net effects of the AQC Audit on BMWP score and number of scoring taxa for North West Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Central	13	2.15	7.69	15	0.38	0.00	2
AM	5	2.20	0.00	6	0.40	0.00	1
EIG	4	1.75	0.00	8	0.50	0.00	2
JAW	4	2.50	25.00	15	0.25	0.00	2
Northern	20	2.90	15.00	31	0.75	10.00	5
AJ	10	-0.90	0.00	5	0.20	0.00	1
NC	10	6.70	30.00	31	1.30	20.00	5
Southern	20	7.90	20.00	44	1.50	30.00	7
AG	10	11.30	30.00	44	2.00	40.00	7
DGH	3	4.00	0.00	12	1.00	33.33	3
LM	4	5.00	25.00	20	1.00	25.00	4
TP	3	4.33	0.00	10	1.00	0.00	2
North West Region	53	4.60	15.09	44	0.94	15.09	7

Table 28. The families missed by North West Region's AQC inspectors

Family	n	% of North West Region's missed taxa in AQC Audit
Hydrophilidae (incl. Hydraenidae)	4	7.84
Hydrobiidae (incl. Bithyniidae)	4	7.84
Psychomyiidae (incl. Ecnomidae)	3	5.88
Rhyacophilidae (incl. Glossosomatidae)	3	5.88
Planorbidae	3	5.88
Hydroptilidae	3	5.88
Caenidae	2	3.92
Erpobdellidae	2	3.92
Tipulidae	2	3.92
Leptoceridae	2	3.92
Sphaeriidae	2	3.92
Simuliidae	2	3.92
Planariidae (incl. Dugesiidae)	2	3.92
Polycentropodidae	2	3.92
Glossiphoniidae	2	3.92
Sericostomatidae	1	1.96
Sialidae	1	1.96
Scirtidae	1	1.96
Piscicolidae	1	1.96
Physidae	1	1.96
Odontoceridae	1	1.96
Haliplidae	1	1.96
Elmidae	1	1.96
Ephemerellidae	1	1.96
Dytiscidae (incl. Noteridae)	1	1.96
Dendrocoelidae	1	1.96
Lymnaeidae	1	1.96
Asellidae	1	1.96
TOTAL	51	100.00

Table 29 The species missed by North West Region's AQC inspectors

Species	n	% of North West Region's missed species in AQC Audit
Potamopyrgus jenkinsi (Smith)	4	7.84
Erpobdellidae indet	2	3.92
Dicranota sp.	2	3.92
Caenis rivulorum Eaton	2	3.92
Pisidium sp.	2	3.92
Tinodes waeneri (L.)	2	3.92
Rhyacophila dorsalis (Curtis)	2	3.92
Polycentropus flavomaculatus (Pictet)	2	3.92
Hydroptila sp.	2	3.92
Lymnaea sp.	1	1.96
Lype sp.	1	1.96
Mystacides azurea (L.)	1	1.96
Odontocerum albicorne (Scopoli)	1	1.96
Oxyethira sp.	1	1.96
Physa sp.	1	1.96
Planariidae indet	1	1.96
Sialis fuliginosa Pictet	1	1.96
Polycelis nigra/tenuis	1	1.96
Sericostoma personatum (Spence)	1	1.96
Simulium (Eusimulium) aureum group	1	1.96
Dendrocoelum lacteum (Muller)	1	1.96
Glossiphonia complanata (L.)	1	1.96
Piscicola geometra (L.)	1	1.96
Ephemerella ignita (Poda)	1	1.96
Simulium (Simulium) ornatum group	1	1.96
Hydraena gracilis Germar	1	1.96
Elodes sp.	1	1.96
Elmis aenea (Muller)	1	1.96
Glossiphonia heteroclita (L.)	1	1.96
Haliplus sp.	1	1.96
Helophorus (Atracthelophorus) brevipalpis Bedel	1	1.96
Bathyomphalus contortus (L.)	1	1.96
Asellus meridianus Racovitza	1	1.96
Armiger crista (L.)	1	1.96
Anisus vortex (L.)	1	1.96
Agapetus sp.	1	1.96
Helophorus sp.	1	1.96
Agabus sp./Ilybius sp.	1	1.96
Athripsodes bilineatus (L.)	1	1.96
Helophorus (Helophorus) flavipes/obscurus	1	1.96
TOTAL	51	100.00

AUDIT OF SOUTHERN REGION'S AQC INSPECTORS

Table 30. The 28 AQC'd samples audited for the Eastern Area of Southern Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Brede Tributary 45	Stubb Lane	E1	0	0	0
Powderhill Stream	Plough Inn	E1	0	0	0
Great Stour	Blackmill Bridge	E1	0	1	0
Shuttle	Black Prince	E1	0	0	0
Cradlebridge Sewer	Redhill Bridge	E1	0	0	0
East Stour	Aldington Road	E4	0	0	0
Great Stour	Bucksford	E4	0	0	0
Great Stour	Whitemill Bridge	E4	1	2	0
SUMMER					
Teise Tributary	Kilndown - Risebridge Farm	E1	0	0	0
Wateringbury Stream	Wateringbury	E1	0	0	0
Shortbridge Stream	Shortbridge Mill	E1	0	1	0
Bault	Yalding	E4	0	1	0
Newmill Channel	Potmans Heath	E4	0	0	0
Uck	Hastingford Bridge	E4	0	1	0
AUTUMN					
Eridge Stream	Eridge Station	E1	0	1	0
Tillingham	Beckley Furnace	E1	0	1	0
Great Stour	Whitemill Bridge	E1	0	1	0
Kent Rother	Newenden	E1	0	0	0
Hammer Stream	Buckhurst	E1	0	2	0
Shortbridge Stream	Shortbridge Mill	E1	0	0	0
Great Stour	Little Chart	E1	0	0	0
Corkwood Stream	Old House Farm	E1	0	2	0
Medway	Balls Green, Withyham	E1	0	2	0
Bewl	A21 Bewl Bridge	E1	0	0	0
Vinehall Stream	u/s EWWC abstraction	E4	0	2	0
Loose Stream	Ivy Mill	E4	0	0	0
Brede	Brede Bridge	E4	0	1	0
Pippingford Brook Tributary	Half Moon	E4	0	2	0

Table 31. The 22 AQC'd samples audited for the Western Area of Southern Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Monks Brook	Chestnut Avenue	W19	0	0	0
Blackwater	Nutsey Bridge	W19	0	0	0
Hamble	site 1 - u/s Bishops Waltham STW	W19	0	0	0
Arun	Wellcross Bridge	W19	2	0	0
Chichester Canal	A27 Bypass Bridge	W19	0	0	0
Blackwater	Hampworth Bridge	W19	0	0	0
Fletchwood Stream	Woodlands	W19	0	0	0
Arun	Bucks Green	W19	0	0	0
Plummers Water	Site 2 - d/s Garden Centre	W9	0	1	0
Dark Alley Gill	Rhodos Arch	W9	0	0	0
AUTUMN					
Test	Wherwell	W19	0	1	0
Rother (Western)	Fittleworth Mill (d/s)	W19	1	0	0
Costers Brook	Cocking Church	W19	0	0	0
Danes Stream	Milford	W19	0	0	0
Thorley Brook	Thorley Bridge	W19	0	0	0
Shedfield Stream	Barn Farm	W19	0	0	0
Wroxall Stream	Redhill Lane	W9	0	0	0
Hoeford Lake	B3385 Bridge	W9	0	0	0
Ashley Stream	White Croft	W9	0	0	0
Adur East	Wortleford Bridge	W9	0	1	0
Crofton Stream	Crofton Dairy Farm	W9	0	0	0
Test	Overton	W9	0	0	0

Table 32. Statistics of the 1996 AQC Audit results for Southern Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Eastern	28	0.71	0.15	0	0.00	2	0.75	0.17
E1	18	0.61	0.18	0	0.00	2	0.61	0.18
E4	10	0.90	0.28	0	0.00	2	1.00	0.33
Western	22	0.14	0.07	0	0.00	1	0.27	0.12
W19	14	0.07	0.07	0	0.00	1	0.29	0.16
W9	8	0.25	0.16	0	0.00	1	0.25	0.16
Southern Region	50	0.46	0.10	0	0.00	2	0.54	0.11

Table 33. Net effects of the AQC Audit on BMWP score and number of scoring taxa for Southern Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Eastern	28	4.39	10.71	18	0.68	0.00	2
E1	18	3.67	11.11	15	0.61	0.00	2
E4	10	5.70	10.00	18	0.80	0.00	2
Western	22	0.14	0.00	10	0.00	0.00	1
W19	14	-0.50	0.00	10	-0.14	0.00	1
W9	8	1.25	0.00	5	0.25	0.00	1
EA Southern	50	2.52	6.00	18	0.38	0.00	2

Table 34. The families missed by Southern Region's AQC inspectors

Family	n	% of Southern Region's missed taxa in AQC Audit
Hydroptilidae	4	21.05
Psychomyiidae (incl. Ecnomidae)	3	15.79
Simuliidae	2	10.53
Leptoceridae	2	10.53
Asellidae	2	10.53
Sericostomatidae	1	5.26
Lepidostomatidae	1	5.26
Halipidae	1	5.26
Elmidae	1	5.26
Tipulidae	1	5.26
Piscicolidae	1	5.26
TOTAL	19	100.00

Table 35 The species missed by Southern Region's AQC inspectors

Species	n	% of Southern Region's missed species in AQC Audit
Hydroptila sp.	4	21.05
Lepidostoma hirtum (Fabricius)	1	5.26
Lype sp.	1	5.26
Tinodes waeneri (L.), Lype sp.	1	5.26
Sericostoma personatum (Spence)	1	5.26
Piscicola geometra (L.)	1	5.26
Tinodes waeneri (L.)	1	5.26
Simulium (Simulium) ornatum group	1	5.26
Simulium (Boophthora) erythrocephalum (deGeer)	1	5.26
Erioptera sp.	1	5.26
Elmis aenea (Muller)	1	5.26
Asellus meridianus Racovitza	1	5.26
Asellus aquaticus (L.)	1	5.26
Adicella/Triaenodes group	1	5.26
Adicella reducta (Mclachlan)	1	5.26
Halipus fluviatilis Aube	1	5.26
TOTAL	19	100.00

AUDIT OF SOUTH WEST REGION'S AQC INSPECTORS

Table 36. The 14 AQC'd samples audited for the Cornwall Area of South West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Small Brook	Youlden Bridge	KAI	0	0	0
Trethurgy Stream	u/s Confluence	KAI	0	0	0
Goonhusband Tributary	Goonhusband	KAI	0	0	0
Penrose Stream	Penrose	KAI	0	0	0
Newlyn	Buryas Bridge	KAI	0	0	0
Lamorna Stream	Lamorna	KAI	0	0	0
Lyd	u/s Ambrosia Bridge	SDT	0	1	0
SUMMER					
Tredavoe	u/s Tredavoe	KAI	0	0	0
Coads Green Stream	u/s Coads Green	KAI	1	0	0
St Keverne	u/s St Keverne	KAI	0	0	0
Milton Coombe Stream	d/s Milton Coombe	TJR	0	0	0
AUTUMN					
Camel	Poleys Bridge	RJW	0	0	0
Colesmill Stream	d/s Holsworthy STW	RJW	0	0	0
Tamar	d/s Small Brook	SDT	0	0	0

Table 37. The 20 AQC'd samples audited for the Devon Area of South West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Mere	A386 Bridge	AH	0	0	0
Kenn	A38 Bridge, Kennford	LK	0	0	0
Knowl Water	Wrafton Bridge	LK	0	0	0
SUMMER					
Bray	d/s Brayford STW	AH	0	1	0
Southpool Stream	u/s Kernborough STW	AH	0	1	0
Aller Brook Tributary	Coffinswell STW d/s 2	AH	0	0	0
Bovey	u/s North Bovey STW	AH	0	0	0
Madford Brook Tributary	d/s Shillingford St George STW	AH	0	3	0
Erne	u/s Stowford Weir	LB	0	0	0
Mere Tributary	d/s Merton STW	LK	0	0	0
Spires Lake	u/s Track Bridge	LK	0	0	0
Lew	Hatherleigh Bridge	LK	0	1	0
Tale	u/s Talaton Stream confluence	LK	0	0	0
Kenn	A38 Bridge, Kennford	LK	0	0	0
Churchingford Stream	u/s STW discharge	LK	0	1	0
Dodscott Brook Tributary	d/s Discharge	LK	0	0	0
Exe	u/s STW discharge	LK	0	0	0
AUTUMN					
Axe	Nunford Dairy	AH	0	0	0
Kenn	Brenton Farm	LB	0	1	0
Colley Lake	u/s Lenton Ford	LK	0	1	0

Table 38. The 17 AQC'd samples audited for the North Wessex Area of South West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Wellow Brook	Site 1 Farm Dairies	AB	0	0	0
Trym	u/s Stoke Rd C.S.O.	APH	0	0	0
Wellow Brook	Site 3 u/s Rescam	APH	0	0	0
Whitelake	u/s Steanbow Bridge	JF	0	0	0
SUMMER					
Combe Brook	d/s C.S.O.	AB	0	0	0
Clutton Stream	d/s Clutton Site 4	AB	0	0	0
Brue	South Brewham	AB	0	0	0
Bristol Avon	Lacock, d/s Bewley STW	AB	1	0	0
Unknown watercourse	d/s Grittleton STW	AB	1	0	0
Cam Brook	Dunkerton	APH	0	1	0
Hepphills Rhine Tributary	Site 1 d/s Harnhill Quarry	APH	0	1	0
Brue	u/s Ansford STW	APH	0	0	0
AUTUMN					
Tone	u/s Sandylands STW	AB	0	0	0
Upper Somerset Frome	Site 6	AB	1	1	0
Yeo	GQA 4201	APH	0	0	0
Washford	d/s Luxborough STW	JF	0	0	0
Yeo	u/s Lake WTW	JF	1	0	0

Table 39. The 20 AQC'd samples audited for the South Wessex Area of South West Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Key Brook Tributary	Angel Farm	GPG	0	0	0
Ebble Tributary	Mount Sorrel	GPG	0	0	0
Key Brook	Joliffes Farm	GPG	0	1	0
Iwerne	Stourpaine	GPG	0	1	0
Nadder	Wilton	MP	0	0	0
Frome	Holme Bridge	MP	0	0	0
Hampshire Avon	Hale Park	PRH	0	2	0
Clockhouse Brook	Burton	PRH	0	0	0
Stour	Blackwater Junction	PRH	0	1	0
SUMMER					
Bow Brook Tributary	u/s Yenston STW	PRH	0	1	0
Moors	u/s Moors Close STW	PRH	0	0	0
Moors	d/s Moors Close STW	PRH	0	1	0
Western Avon Tributary	d/s Stanton St Bernard	PRH	0	0	0
Worth Matravers	u/s Worth Matravers STW	PRH	0	0	0
AUTUMN					
Key Brook	Blynfield Farm	PRH	0	0	0
Manston Brook	Hay Bridge	PRH	0	1	0
Sem	Bilhay Farm	PRH	0	2	0
Wonston Stream	d/s Wonston	PRH	1	1	0
Stour	Parley Green	PRH	0	0	0
Stour	Berry Hill	PRH	0	1	0

Table 40. Statistics of the 1996 AQC Audit results for South West Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Cornwall	14	0.07	0.07	0	0.00	1	0.14	0.10
KAI	9	0.00	0.00	0	0.00	0	0.11	0.11
RJW	2	0.00	0.00	0	0.00	0	0.00	0.00
SDT	2	0.50	0.50	0	0.00	1	0.50	0.50
TJR	1	0.00	n/a	0	0.00	0	0.00	n/a
Devon	20	0.45	0.17	1	5.00	3	0.45	0.17
AH	7	0.71	0.42	1	14.29	3	0.71	0.42
LB	2	0.50	0.50	0	0.00	1	0.50	0.50
LK	11	0.27	0.14	0	0.00	1	0.27	0.14
North Wessex	17	0.18	0.10	0	0.00	1	0.41	0.15
AB	8	0.13	0.13	0	0.00	1	0.50	0.27
APH	6	0.33	0.21	0	0.00	1	0.33	0.21
JF	3	0.00	0.00	0	0.00	0	0.33	0.33
South Wessex	20	0.60	0.15	0	0.00	2	0.65	0.17
GPG	4	0.50	0.29	0	0.00	1	0.50	0.29
MP	2	0.00	0.00	0	0.00	0	0.00	0.00
PRH	14	0.71	0.19	0	0.00	2	0.79	0.21
South West Region	71	0.35	0.07	1	1.41	3	0.44	0.08

Table 41. Net effects of the AQC Audit on BMWP score and number of scoring taxa for South West Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Cornwall	14	0.14	0.00	7	0.00	0.00	1
KAI	9	-0.56	0.00	0	-0.11	0.00	0
RJW	2	0.00	0.00	0	0.00	0.00	0
SDT	2	3.50	0.00	7	0.50	0.00	1
TJR	1	0.00	0.00	0	0.00	0.00	0
Devon	20	2.85	5.00	18	0.45	5.00	3
AH	7	4.86	14.29	18	0.71	14.29	3
LB	2	2.50	0.00	5	0.50	0.00	1
LK	11	1.64	0.00	10	0.27	0.00	1
North Wessex	17	0.41	0.00	10	-0.06	0.00	1
AB	8	-0.63	0.00	3	-0.25	0.00	0
APH	6	2.50	0.00	10	0.33	0.00	1
JF	3	-1.00	0.00	0	-0.33	0.00	0
South Wessex	20	3.60	5.00	14	0.55	0.00	2
GPG	4	3.75	0.00	10	0.50	0.00	1
MP	2	0.00	0.00	0	0.00	0.00	0
PRH	14	4.07	7.14	14	0.64	0.00	2
South West Region	71	1.94	2.82	18	0.27	1.41	3

Table 42. The families missed by South West Region's AQC inspectors

Family	n	% of South West Region's missed taxa in AQC Audit
Leptophlebiidae	2	10.00
Valvatidae	1	5.00
Leuctridae	1	5.00
Limnephilidae	1	5.00
Perlodidae	1	5.00
Planariidae (incl. Dugesiidae)	1	5.00
Tipulidae	1	5.00
Nepidae	1	5.00
Sphaeriidae	1	5.00
Brachycentridae	1	5.00
Leptoceridae	1	5.00
Phryganeidae	1	5.00
Baetidae	1	5.00
Caenidae	1	5.00
Elmidae	1	5.00
Gyrinidae	1	5.00
Asellidae	1	5.00
Hydroptilidae	1	5.00
Lepidostomatidae	1	5.00
TOTAL	20	100.00

Table 43 The species missed by South West Region's AQC inspectors

Species	n	% of South West Region's missed species in AQC Audit
Pilaria (Pilaria) sp.	1	5.00
Orectochilus villosus (Muller)	1	5.00
Oulimnius tuberculatus (Muller)	1	5.00
Paraleptophlebia submarginata (Stephens)	1	5.00
Valvata piscinalis (Muller)	1	5.00
Phryganeidae indet	1	5.00
Pisidium sp.	1	5.00
Nepa cinerea L.	1	5.00
Brachycentrus subnubilus Curtis	1	5.00
Perlodes microcephala (Pictet)	1	5.00
Lepidostoma hirtum (Fabricius)	1	5.00
Habrophlebia fusca (Curtis)	1	5.00
Caenis rivulorum Eaton	1	5.00
Baetis buceratus Eaton	1	5.00
Athripsodes sp.	1	5.00
Asellus aquaticus (L.)	1	5.00
Anabolia nervosa (Curtis)	1	5.00
Agraylea multipunctata Curtis	1	5.00
Leuctra fusca (L.)	1	5.00
Dugesia lugubris/polychroa	1	5.00
TOTAL	20	100.00

AUDIT OF THAMES REGION'S AQC INSPECTORS

Table 44. The 30 AQC'd samples audited for the Fobney Mead Laboratory of Thames Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SUMMER					
Mole	u/s Gatwick Stream	313	1	1	1
Thames	3 Valleys Water Intake	313	1	3	0
Letcombe Brook	Weir Farm, East Hanney	313	1	1	0
Bloxham Brook	u/s Sor Brook	313	0	2	0
Lyde	Deanlands Farm	313	0	5	1
Thame	Wheatley Bridge	313	1	0	0
Caker Stream	d/s Alton STW	313	0	0	0
AUTUMN					
South Marston Brook	Nightingale Lane	300	0	1	0
Ray	Seven Bridges	300	0	3	0
Blunsdon Brook	Water Eaton	300	0	0	0
Ray	Moredon Bridge	300	0	4	0
Haydon Wick Brook	u/s R.Ray	300	0	0	0
Lydiard Brook	d/s Lydiard Millicent STW	300	0	0	0
Lydiard Brook	u/s R.Ray	300	0	1	1
Scotsgrove Brook	u/s Haddenham STW	300	0	1	0
Lashlake Stream	u/s Scotsgrove Brook	300	0	0	0
Deddington Brook	Cold Harbour Farm	309	0	0	0
Kennet	Water inlet, Chilton Foliat	309	0	0	0
Highmoor Brook	d/s Brize Norton Stream	309	0	2	0
Broadwell Brook	Friars Court	309	0	0	0
Radcot Cut	u/s Great Brook	309	0	4	0
Wadley Stream	u/s R.Thames	309	0	0	0
Faringdon Brook	A4095, Great Faringdon	309	0	3	0
Clayhill Brook	d/s Burghfield STW	313	0	1	0
Chacombe Brook	u/s Cherwell, A361	313	0	2	1
Bennets Ditch	A418 Bridge, Oxford	313	0	1	0
Bourne	u/s Thames	313	0	3	1
Slade Barn Stream	d/s Guiting Power	313	0	1	0
Silchester Brook	d/s Silchester STW	313	0	0	0
Foudry Brook	Hartley Court Farm	313	1	2	0

Table 45. The 30 AQC'd samples audited for the Waltham Cross Laboratory of Thames Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Ver	Sopwell	JE	1	3	0
Ver	d/s Holywell Hill	JE	0	1	0
SUMMER					
Colne	Halfway House PH	DJL	0	1	0
Mimmshall Brook	A1081 Bridge	DJL	0	0	0
Potters Bar Brook	u/s Mimmshall Brook	DJL	0	0	0
Catherine Bourne	Rabley Park	DJL	0	0	0
Colne	u/s Thames	JE	0	3	0
Chess	d/s Bois Mill	JE	1	1	0
Dane End Tributary	At Sacombe	JE	0	1	0
Kitts End Stream	d/s Wrotham Park Stream	JE	0	1	0
Stevenage Brook	Frogmore Hall	JE	0	0	0
AUTUMN					
Colne	d/s Moorfield Road	DJL	0	0	0
New Years Green Bourne	u/s Frays River	DJL	0	1	0
Alderbourne	d/s Fulmer	DJL	0	0	0
Ellen Brook	u/s Colne	DJL	0	1	0
Colne (Stockers Reach)	u/s Weir, Maple Cross	DJL	0	1	0
Wraysbury	Staines Moor	DJL	0	1	0
Pool	Winsford Road	DJL	0	1	0
Beck	d/s Kelsey Park Lake	DJL	0	0	0
Beck	Cator Park	DJL	0	2	0
Beck	u/s Kelsey Park Lake	DJL	0	0	0
Beck	High Broom Wood	DJL	0	0	0
Wandle	Goat Bridge	DJL	0	1	0
Quaggy	Dermody Road	DJL	0	1	0
Alderbourne	A412 Bridge, Denham	JE	1	1	0
Ravensbourne	Beckenham Place Park	JE	0	1	0
Rib	u/s Gatesbury Weir	JE	0	0	0
Rib	B1386 Bridge, Gatesbury	JE	0	2	0
Kydbrook East	Derwent Drive	JE	1	0	0
Corbetts Tey Brook	d/s Tributary	JE	0	1	0

Table 46. Statistics of the 1996 AQC Audit results for Thames Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Fobney Mead	30	1.37	0.26	7	23.33	5	1.70	0.30
300	9	1.11	0.48	2	22.22	4	1.22	0.49
309	7	1.29	0.64	2	28.57	4	1.29	0.64
313	14	1.57	0.37	3	21.43	5	2.21	0.46
Waltham Cross	30	0.83	0.15	2	6.67	3	0.97	0.18
DJL	17	0.59	0.15	0	0.00	2	0.59	0.15
JE	13	1.15	0.27	2	15.38	3	1.46	0.31
Thames Region	60	1.10	0.16	9	15.00	5	1.33	0.18

Table 47. Net effects of the AQC Audit on BMWP score and number of scoring taxa for Thames Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Fobney Mead	30	6.23	20.00	33	1.20	20.00	5
300	9	5.56	22.22	18	1.11	22.22	4
309	7	5.00	14.29	18	1.29	28.57	4
313	14	7.29	21.43	33	1.21	14.29	5
Waltham Cross	30	4.13	10.00	22	0.70	3.33	3
DJL	17	2.76	0.00	10	0.59	0.00	2
JE	13	5.92	23.08	22	0.85	7.69	3
Thames Region	60	5.18	15.00	33	0.95	11.67	5

Table 48. The families missed by Thames Region's AQC inspectors

Family	n	% of Thames Region's missed taxa in AQC Audit
Elmidae	6	9.68
Planariidae (incl. Dugesiidae)	5	8.06
Hydrophilidae (incl. Hydraenidae)	4	6.45
Hydropsychidae	4	6.45
Hydroptilidae	4	6.45
Hydrobiidae (incl. Bithyniidae)	3	4.84
Baetidae	3	4.84
Caenidae	3	4.84
Dytiscidae (incl. Noteridae)	3	4.84
Physidae	2	3.23
Polycentropodidae	2	3.23
Simuliidae	2	3.23
Valvatidae	2	3.23
Planorbidae	2	3.23
Ancylidae (incl. Acroloxidae)	2	3.23
Brachycentridae	2	3.23
Haliplidae	2	3.23
Glossiphoniidae	2	3.23
Dendrocoelidae	2	3.23
Sericostomatidae	1	1.61
Rhyacophilidae (incl. Glossosomatidae)	1	1.61
Psychomyiidae (incl. Ecnomidae)	1	1.61
Coenagriidae	1	1.61
Dryopidae	1	1.61
Lymnaeidae	1	1.61
Goeridae	1	1.61
TOTAL	62	100.00

Table 49. The species missed by Thames Region's AQC inspectors

Species	n	% of Thames Region's missed species in AQC Audit
Hydroptila sp.	4	6.35
Caenis luctuosa/macrura	3	4.76
Potamopyrgus jenkinsi (Smith)	3	4.76
Elmis aenea (Muller)	3	4.76
Oulimnius tuberculatus (Muller)	2	3.17
Gyraulus albus (Muller)	2	3.17
Haliplus sp.	2	3.17
Polycelis nigra/tenuis	2	3.17
Oulimnius sp.	2	3.17
Helobdella stagnalis (L.)	2	3.17
Ancylus fluviatilis Muller	2	3.17
Simulium (Simulium) ornatum group	2	3.17
Brachycentrus subnubilus Curtis	2	3.17
Baetis rhodani (Pictet)	2	3.17
Dendrocoelum lacteum (Muller)	2	3.17
Valvata piscinalis (Muller)	1	1.59
Valvata cristata Muller	1	1.59
Physa fontinalis (L.)	1	1.59
Physa sp.	1	1.59
Sericostoma personatum (Spence)	1	1.59
Platambus maculatus (L.)	1	1.59
Polycentropus sp.	1	1.59
Tinodes waeneri (L.)	1	1.59
Potamonectes sp.	1	1.59
Silo nigricornis (Pictet)	1	1.59
Planariidae indet	1	1.59
Coenagriidae indet	1	1.59
Cyrnus trimaculatus (Curtis)	1	1.59
Lymnaea peregra (Muller)	1	1.59
Agapetus sp.	1	1.59
Baetis vernus Curtis	1	1.59
Agabus sp./Ilybius sp.	1	1.59
Dryops sp.	1	1.59
Dugesia lugubris/polychroa	1	1.59
Dugesia tigrina (Girard)	1	1.59
Helophorus (Atracthelophorus) brevipalpis Bedel	1	1.59
Hydraena riparia Kugelann	1	1.59
Hydrobius fuscipes (L.)	1	1.59
Hydrophilidae indet	1	1.59
Hydropsyche angustipennis (Curtis)	1	1.59
Hydropsyche contubernalis Mclachlan	1	1.59
Hydropsyche siltalai Dohler	1	1.59
Hydropsyche sp.	1	1.59
TOTAL	63	100.00

AUDIT OF WELSH REGION'S AQC INSPECTORS

Table 50. The 8 AQC'd samples audited for the Northern Area of Welsh Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Afon y Garth	d/s Footbridge	353	0	0	0
Afon y Garth	u/s Adit	353	0	1	0
Bowydd	B4414 Bridge	355	0	1	0
SUMMER					
Nant y Ffrith	d/s WTW	353	1	0	0
Llyfni Tributary	u/s Cwmdulyn WTW	353	0	1	0
Un-named	u/s Ffrith STW	355	0	1	0
Un-named	d/s Hendre Tilcon STW	355	0	0	0
AUTUMN					
Dwryd	d/s Cynfal	353	1	4	0

Table 51. The 16 AQC'd samples audited for the South Eastern Area of Welsh Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Taf Fechan	d/s Pontskill WTW	NS	0	0	0
Nant Cilieni	Site 3 d/s Stream	SR	0	0	0
SUMMER					
Taf Fawr	d/s Llwynon	NS	0	0	0
Nant-yr-Aber	Caerphilly	NS	0	0	0
Grwyne Fawr	d/s Grwyne Fawr WTW	NS	0	0	0
Mynachdy Brook	u/s Tafarn Trolth STW	NS	0	1	0
Nant-y-Glaswg	d/s Creigiau STW	NS	0	0	0
Clydach	u/s Anacomp	NS	0	0	0
Mychydd Tributary	Nr Royal Mint	NS	1	1	0
Lugg	u/s Byton WTW	NS	0	1	0
Newbridge Brook	d/s Weobley STW	NS	0	0	0
Yazor Brook	u/s Burghill STW	NS	0	0	0
Nant Caerfanell	u/s Talybont WTW	NS	0	0	0
AUTUMN					
Taf Fawr	u/s Llwyn-on Reservoir	NS	0	0	1
Nant Cadlan	d/s Penderyn Quarry	NS	0	0	0
Cadoxton	d/s Dow Corning	NS	0	0	0

Table 52. The 20 AQC'd samples audited for the South Western Area of Welsh Region

River	Site	AQC Analyst	Losses	Gains	Omissions
SPRING					
Clyne	Site 12 - WQ site	KJ	0	0	0
SUMMER					
Nant y Gwyddol	Derlwyn	GR	1	1	0
Myddfai	d/s Salem STW	GR	0	1	0
Neath	Site 6 - Canal Impact Survey	GR	0	0	0
Loughor	d/s Garnswllt STW (2)	GR	0	0	0
Teifi	u/s Llandyssul STW	GR	0	1	1
Gwendraeth Estuary Tributary	d/s Llansaint STW	GR	0	0	0
Duar	Llanybydder d/s service reservoir	KJ	0	1	0
Nant Pant-yr-Haidd	d/s Llanafan Council Works	KJ	0	0	0
Melindwr Tributary	u/s Rhydcymerau New STW	KJ	1	1	0
Saundersfoot Stream	Site 2, d/s STW	SL	0	0	0
Tawe	d/s Ystradgynlais STW	SL	0	0	0
Tywi	d/s Llandovery STW	SL	0	1	0
Bow Street Brook	u/s Bow Street STW	SL	2	0	0
Cresswell Tributary	u/s Langdon STW	SL	0	1	0
Bran	d/s Llandovery Mart CSO	SL	0	0	0
Llynfi	d/s Caerau Colliery	SL	1	0	0
AUTUMN					
Afon Gido Tributary	u/s Llanarth CSO	GR	0	1	0
Westfield Pill	u/s Confluence with affected tributary	KJ	0	1	0
Taf	u/s Mansel Davies	SL	1	0	0

Table 53. Statistics of the 1996 AQC Audit results for Welsh Region

Analyst/Group	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Northern	8	1.00	0.46	1	12.50	4	1.25	0.56
353	5	1.20	0.73	1	20.00	4	1.60	0.87
355	3	0.67	0.33	0	0.00	1	0.67	0.33
South Eastern	16	0.19	0.10	0	0.00	1	0.31	0.15
NS	15	0.20	0.11	0	0.00	1	0.33	0.16
SR	1	0.00	n/a	0	0.00	0	0.00	n/a
South Western	20	0.45	0.11	0	0.00	1	0.80	0.17
GR	7	0.57	0.20	0	0.00	1	0.86	0.34
KJ	5	0.60	0.24	0	0.00	1	0.80	0.37
SL	8	0.25	0.16	0	0.00	1	0.75	0.25
RJJ	6	0.33	0.21	0	0.00	1	0.33	0.21
VH	5	0.80	0.20	0	0.00	1	1.20	0.37
Welsh Region	44	0.45	0.11	1	2.27	4	0.70	0.14

Table 54. Net effects of the AQC Audit on BMWP score and number of scoring taxa for Welsh Region

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 taxa	Maximum underestimate of no. of taxa
Northern	8	8.00	12.50	34	0.75	12.50	3
353	5	9.80	20.00	34	0.80	20.00	3
355	3	5.00	0.00	10	0.67	0.00	1
South Eastern	16	0.81	0.00	6	0.13	0.00	1
NS	15	0.87	0.00	6	0.13	0.00	1
SR	1	0.00	0.00	0	0.00	0.00	0
South Western	20	0.60	0.00	10	0.15	0.00	1
GR	7	2.43	0.00	7	0.43	0.00	1
KJ	5	2.40	0.00	10	0.40	0.00	1
SL	8	-2.13	0.00	6	-0.25	0.00	1
Welsh Region	44	2.02	2.27	34	0.25	2.27	3

Table 55. The families missed by Welsh Region's AQC inspectors

Family	n	% of Welsh Region's missed taxa in AQC Audit
Dytiscidae (incl. Noteridae)	2	10.53
Polycentropodidae	2	10.53
Hydroptilidae	2	10.53
Goeridae	2	10.53
Beraeidae	1	5.26
Hydrophilidae (incl. Hydraenidae)	1	5.26
Caenidae	1	5.26
Lepidostomatidae	1	5.26
Leuctridae	1	5.26
Odontoceridae	1	5.26
Simuliidae	1	5.26
Rhyacophilidae (incl. Glossosomatidae)	1	5.26
Scirtidae	1	5.26
Sericostomatidae	1	5.26
Elmidae	1	5.26
TOTAL	19	100.00

Table 56. The species missed by Welsh Region's AQC inspectors

Species	n	% of Welsh Region's missed species in AQC Audit
Silo sp.	2	10.53
Ithytrichia sp.	2	10.53
Oreodytes sanmarkii (Sahlberg)	1	5.26
Plectrocnemia conspersa (Curtis)	1	5.26
Plectrocnemia sp.	1	5.26
Sericostoma personatum (Spence)	1	5.26
Odontocerum albicorne (Scopoli)	1	5.26
Beraea maurus (Curtis)	1	5.26
Rhyacophila dorsalis (Curtis)	1	5.26
Leuctra fusca (L.)	1	5.26
Lepidostoma hirtum (Fabricius)	1	5.26
Helophorus (Atracthelophorus) brevipalpis Bedel	1	5.26
Elodes sp.	1	5.26
Caenis luctuosa/macrura	1	5.26
Agabus sp.	1	5.26
Simulium (Eusimulium) aureum group	1	5.26
Elmis aenea (Muller)	1	5.26
TOTAL	19	100.00

SUMMARY OF AQC AUDIT FOR ENVIRONMENT AGENCY

Table 57. Statistics of the 1996 AQC Audit results for each Agency laboratory

Analyst/Group	n	Mean gains	Standard error	No. sample s >2 gains	% samples >2 gains	Highest no. gains	Mean errors (I+g+o)	Standard error
Anglian Region	59	0.76	0.12	4	6.78	4	0.97	0.14
Central	19	0.89	0.20	1	5.26	3	1.26	0.27
Eastern	20	0.60	0.23	2	10.00	3	0.75	0.26
Northern	20	0.80	0.20	1	5.00	4	0.90	0.20
Midlands Region	80	0.95	0.13	9	11.25	4	1.09	0.13
Upper Severn	20	0.75	0.25	3	15.00	3	1.00	0.27
Lower Severn	20	0.95	0.28	2	10.00	4	1.05	0.29
Upper Trent	20	1.15	0.25	3	15.00	4	1.15	0.25
Lower Trent	20	0.95	0.25	1	5.00	4	1.15	0.28
North East Region	59	0.78	0.15	4	6.78	6	1.00	0.17
Dales	20	1.25	0.35	3	15.00	6	1.45	0.36
Northumbria	19	0.26	0.13	0	0.00	2	0.47	0.19
S. Yorkshire	20	0.80	0.20	1	5.00	3	1.05	0.27
North West Region	53	1.26	0.20	10	18.87	7	1.74	0.22
Central	13	0.85	0.30	2	15.38	3	1.38	0.42
Northern	20	1.15	0.30	2	10.00	5	1.75	0.34
Southern	20	1.65	0.40	6	30.00	7	1.95	0.39
South West Region	71	0.35	0.07	1	1.41	3	0.44	0.08
Cornwall	14	0.07	0.07	0	0.00	1	0.14	0.10
Devon	20	0.45	0.17	1	5.00	3	0.45	0.17
North Wessex	17	0.18	0.10	0	0.00	1	0.41	0.15
South Wessex	20	0.60	0.15	0	0.00	2	0.65	0.17
Southern Region	50	0.46	0.10	0	0.00	2	0.54	0.11
Eastern	28	0.71	0.15	0	0.00	2	0.75	0.17
Western	22	0.14	0.07	0	0.00	1	0.27	0.12
Thames Region	60	1.10	0.16	9	15.00	5	1.33	0.18
Fobney Mead	30	1.37	0.26	7	23.33	5	1.70	0.30
Waltham Cross	30	0.83	0.15	2	6.67	3	0.97	0.18
Welsh Region	44	0.45	0.11	1	2.27	4	0.70	0.14
Northern	8	1.00	0.46	1	12.50	4	1.25	0.56
South Eastern	16	0.19	0.10	0	0.00	1	0.31	0.15
South Western	20	0.45	0.11	0	0.00	1	0.80	0.17
Whole of Agency	476	0.77	0.05	38	7.98	7	0.97	0.06

Table 58. Net effects of the AQC Audit on BMWP score and number of scoring taxa for each Agency laboratory

Analyst/Group	n	Mean net effect on BMWP score	% of samples underestimated by score >13	Maximum underestimate of BMWP score	Mean net effect on no. of taxa	% of samples underestimated by >2 samples	Maximum underestimate of no. of taxa
Anglian Region	59	3.41	5.08	23	0.68	5.08	4
Central	19	3.68	5.26	23	0.74	5.26	3
Eastern	20	2.40	5.00	17	0.50	5.00	3
Northern	20	4.15	5.00	23	0.80	5.00	4
Midlands Region	80	4.75	11.25	27	0.84	10.00	4
Upper Severn	20	3.50	20.00	20	0.50	10.00	3
Lower Severn	20	4.65	10.00	25	0.90	10.00	4
Upper Trent	20	6.00	5.00	27	1.15	15.00	4
Lower Trent	20	4.85	10.00	20	0.80	5.00	3
North East Region	59	4.34	6.78	44	0.66	6.78	6
Dales	20	7.65	15.00	44	1.15	15.00	6
Northumbria	19	1.21	5.26	17	0.11	0.00	2
S.Yorkshire	20	4.00	0.00	13	0.70	5.00	3
North West Region	53	4.60	15.09	44	0.94	15.09	7
Central	13	2.15	7.69	15	0.38	0.00	2
Northern	20	2.90	15.00	31	0.75	10.00	5
Southern	20	7.90	20.00	44	1.50	30.00	7
South West Region	71	1.94	2.82	18	0.27	1.41	3
Cornwall	14	0.14	0.00	7	0.00	0.00	1
Devon	20	2.85	5.00	18	0.45	5.00	3
North Wessex	17	0.41	0.00	10	-0.06	0.00	1
South Wessex	20	3.60	5.00	14	0.55	0.00	2
Southern Region	50	2.52	6.00	18	0.38	0.00	2
Eastern	28	4.39	10.71	18	0.68	0.00	2
Western	22	0.14	0.00	10	0.00	0.00	1
Thames Region	60	5.18	15.00	33	0.95	11.67	5
Fobney Mead	30	6.23	20.00	33	1.20	20.00	5
Waltham Cross	30	4.13	10.00	22	0.70	3.33	3
Welsh Region	44	2.02	2.27	34	0.25	2.27	3
Northern	8	8.00	12.50	34	0.75	12.50	3
South Eastern	16	0.81	0.00	6	0.13	0.00	1
South Western	20	0.60	0.00	10	0.15	0.00	1
Whole of Agency	476	3.67	39.00	8	44.00	0.63	32

Table 59. The families missed by the Agency's AQC inspectors

Family	n	% of Agency's missed taxa in AQC Audit
Hydroptilidae	24	7.36
Elmidae	20	6.13
Hydrobiidae (incl. Bithyniidae)	17	5.21
Hydrophilidae (incl. Hydraenidae)	14	4.29
Planariidae (incl. Dugesiidae)	14	4.29
Simuliidae	14	4.29
Psychomyiidae (incl. Ecnomidae)	12	3.68
Haliplidae	12	3.68
Planorbidae	10	3.07
Leptoceridae	10	3.07
Caenidae	10	3.07
Tipulidae	9	2.76
Polycentropodidae	9	2.76
Physidae	8	2.45
Glossiphoniidae	8	2.45
Hydropsychidae	8	2.45
Asellidae	7	2.15
Valvatidae	6	1.84
Dytiscidae (incl. Noteridae)	6	1.84
Limnephilidae	6	1.84
Rhyacophilidae (incl. Glossosomatidae)	6	1.84
Coenagriidae	5	1.53
Sphaeriidae	5	1.53
Goeridae	5	1.53
Sericostomatidae	5	1.53
Lymnaeidae	5	1.53
Ancylidae (incl. Acroloxidae)	5	1.53
Baetidae	5	1.53
Dendrocoelidae	4	1.23
Lepidostomatidae	4	1.23
Nemouridae	4	1.23
Scirtidae	4	1.23
Erpobdellidae	4	1.23
Brachycentridae	4	1.23
Leuctridae	3	0.92
Odontoceridae	3	0.92
Leptophlebiidae	3	0.92
Corophiidae	2	0.61
Chloroperlidae	2	0.61
Chironomidae	2	0.61
Piscicolidae	2	0.61
Gyrinidae	2	0.61
Heptageniidae	2	0.61
Taeniopterygidae	2	0.61
Nepidae	1	0.31
Phryganeidae	1	0.31
Beraeidae	1	0.31
Perlodidae	1	0.31
Oligochaeta	1	0.31
Hirudinidae	1	0.31

Table 59 (continued)

Family	n	% of Agency's missed tax in AQC Audit
Notonectidae	1	0.31
Ephemeridae	1	0.31
Corixidae	1	0.31
Sialidae	1	0.31
Dryopidae	1	0.31
Gammaridae (incl. Crangonyctidae)	1	0.31
Ephemerellidae	1	0.31
Calopterygidae	1	0.31
TOTAL	326	100.00

Table 60. The species missed by the Agency's AQC inspectors

Species	n	% of EA's missed taxa in AQC Audit
Potamopyrgus jenkinsi (Smith)	17	5.14
Hydroptila sp.	16	4.83
Elmis aenea (Muller)	13	3.93
Haliplus sp.	9	2.72
Simulium (Simulium) ornatum group	8	2.42
Tinodes waeneri (L.)	8	2.42
Polycelis nigra/tenuis	7	2.11
Helobdella stagnalis (L.)	5	1.51
Ancyclus fluviatilis Muller	5	1.51
Asellus aquaticus (L.)	5	1.51
Gyraulus albus (Muller)	5	1.51
Caenis luctuosa/macrura	5	1.51
Sericostoma personatum (Spence)	5	1.51
Rhyacophila dorsalis (Curtis)	4	1.21
Polycentropus flavomaculatus (Pictet)	4	1.21
Ithytrichia sp.	4	1.21
Lepidostoma hirtum (Fabricius)	4	1.21
Oulimnius sp.	4	1.21
Ischnura elegans (Van der Linden)	4	1.21
Valvata cristata Muller	4	1.21
Elodes sp.	4	1.21
Dendrocoelum lacteum (Muller)	4	1.21
Caenis rivulorum Eaton	4	1.21
Brachycentrus subnubilus Curtis	4	1.21
Baetis rhodani (Pictet)	3	0.91
Oxyethira sp.	3	0.91
Oulimnius tuberculatus (Muller)	3	0.91
Odontocerum albicorne (Scopoli)	3	0.91
Mystacides azurea (L.)	3	0.91
Lymnaea sp.	3	0.91
Hydraena gracilis Germar	3	0.91
Armiger crista (L.)	3	0.91
Hydropsyche sp.	3	0.91
Dicranota sp.	3	0.91
Valvata piscinalis (Muller)	3	0.91
Hydropsyche siltalai Dohler	3	0.91
Physa fontinalis (L.)	3	0.91
Helophorus (Atracthelophorus) brevipalpis Bedel	3	0.91
Leuctra fusca (L.)	3	0.91
Physa sp.	3	0.91
Silo sp.	3	0.91
Pilaria (Pilaria) sp.	3	0.91
Simulium (Eusimulium) aureum group	3	0.91
Pisidium sp.	3	0.91
Dugesia lugubris/polychroa	2	0.60
Protonemura meyeri (Pictet)	2	0.60
Dugesia tigrina (Girard)	2	0.60
Planariidae indet	2	0.60
Athripsodes bilineatus (L.)	2	0.60
Lype sp.	2	0.60

Table 60 continued

Species	n	% of EA's missed taxa in AQC Audit
Limnephilidae indet	2	0.60
Plectrocnemia conspersa (Curtis)	2	0.60
Habrophlebia fusca (Curtis)	2	0.60
Erpobdellidae indet	2	0.60
Taeniopteryx nebulosa (L.)	2	0.60
Sphaeriidae indet	2	0.60
Chloroperla torrentium (Pictet)	2	0.60
Agapetus sp.	2	0.60
Physa acuta/heterostropha	2	0.60
Lymnaea peregra (Muller)	2	0.60
Agabus sp./Ilybius sp.	2	0.60
Asellus meridianus Racovitza	2	0.60
Piscicola geometra (L.)	2	0.60
Orthoclaadiinae	2	0.60
Orectochilus villosus (Muller)	2	0.60
Ecdyonurus sp.	2	0.60
Ephemerella ignita (Poda)	1	0.30
Dryops sp.	1	0.30
Drusus annulatus/Ecclisopteryx guttulata	1	0.30
Ephemera sp.	1	0.30
Simulium (Boophthora) erythrocephalum (de Geer)	1	0.30
Erioptera sp.	1	0.30
Cynus trimaculatus (Curtis)	1	0.30
Erpobdella octocolata (L.)	1	0.30
Corophium multisetosum Stock	1	0.30
Corophium curvispinum Sars	1	0.30
Coenagriidae indet	1	0.30
Simulium (Nevermannia) angustitarse group	1	0.30
Athripsodes aterrimus (Stephens)	1	0.30
Adicella/Triaenodes group	1	0.30
Agabus sp.	1	0.30
Agraylea multipunctata Curtis	1	0.30
Anabolia nervosa (Curtis)	1	0.30
Tubificidae	1	0.30
Anisus vortex (L.)	1	0.30
Bathyomphalus contortus (L.)	1	0.30
Tinodes waeneri (L.), Lype sp.	1	0.30
Calopteryx sp.	1	0.30
Athripsodes sp.	1	0.30
Austrolimnophila sp.	1	0.30
Baetis buceratus Eaton	1	0.30
Tanytarsini	1	0.30
Baetis vernus Curtis	1	0.30
Beraea maurus (Curtis)	1	0.30
Caenis horaria (L.)	1	0.30
Simulium (Simulium) reptans (L.)	1	0.30
Trocheta sp.	1	0.30
Mystacides nigra/longicornis	1	0.30
Protonemura sp.	1	0.30

Table 60 continued

Species	n	% of EA's missed taxa in AQC Audit
Glossiphoniidae indet	1	0.30
Polycentropus sp.	1	0.30
Polycelis felina (Dalyell)	1	0.30
Laccobius sp.	1	0.30
Plectrocnemia sp.	1	0.30
Limnephilus extricatus Mclachlan	1	0.30
Gammarus pulex (L.)	1	0.30
Platambus maculatus (L.)	1	0.30
Adicella reducta (Mclachlan)	1	0.30
Nemoura avicularis Morton	1	0.30
Nemurella picteti Klapalek	1	0.30
Nepa cinerea L.	1	0.30
Notonecta sp.	1	0.30
Oreodytes sanmarkii (Sahlberg)	1	0.30
Oulimnius major (Rey)	1	0.30
Pilaria sp.	1	0.30
Paraleptophlebia submarginata (Stephens)	1	0.30
Perlodes microcephala (Pictet)	1	0.30
Phryganeidae indet	1	0.30
Limnophila (Eloeophila) sp.	1	0.30
Silo nigricornis (Pictet)	1	0.30
Glossiphonia complanata (L.)	1	0.30
Glossiphonia heteroclita (L.)	1	0.30
Hydropsyche contubernalis Mclachlan	1	0.30
Silo pallipes (Fabricius)	1	0.30
Haemopsis sanguisuga (L.)	1	0.30
Halesus digitatus/radiatus	1	0.30
Haliplidae indet	1	0.30
Potamonectes sp.	1	0.30
Haliphus lineatocollis (Marsham)	1	0.30
Hydropsyche angustipennis (Curtis)	1	0.30
Sigara (Subsigara) falleni (Fieber)	1	0.30
Sialis fuliginosa Pictet	1	0.30
Helophorus (Helophorus) flavipes/obscurus	1	0.30
Helophorus flavipes/obscurus	1	0.30
Helophorus sp.	1	0.30
Psychomyia pusilla (Fabricius)	1	0.30
Hydraena riparia	1	0.30
Hydraena riparia Kugelann	1	0.30
Hydrobius fuscipes (L.)	1	0.30
Hydrophilidae indet	1	0.30
Haliphus fluviatilis Aube	1	0.30
TOTAL	331	100.00

MISSED TAXA FOR ALL SAMPLES IN 1996 AUDIT

Table 61. Missed families for all samples in the 1996 audit

Family	n	% of all missed taxa in 1996 audit
Hydrophilidae (incl. Hydraenidae)	59	5.29
Elmidae	54	4.84
Hydroptilidae	54	4.84
Simuliidae	43	3.86
Hydrobiidae (incl. Bithyniidae)	42	3.77
Psychomyiidae (incl. Ecnomidae)	36	3.23
Sphaeriidae	35	3.14
Planariidae (incl. Dugesiidae)	35	3.14
Caenidae	33	2.96
Tipulidae	32	2.87
Leptoceridae	31	2.78
Lymnaeidae	31	2.78
Goeridae	27	2.42
Valvatidae	26	2.33
Planorbidae	25	2.24
Ancylidae (incl. Acroloxidae)	24	2.15
Haliplidae	24	2.15
Hydropsychidae	23	2.06
Rhyacophilidae (incl. Glossosomatidae)	22	1.97
Asellidae	22	1.97
Lepidostomatidae	22	1.97
Glossiphoniidae	21	1.88
Polycentropodidae	21	1.88
Baetidae	21	1.88
Dendrocoelidae	20	1.79
Leptophlebiidae	19	1.70
Sericostomatidae	19	1.70
Dytiscidae (incl. Noteridae)	19	1.70
Limnephilidae	19	1.70
Physidae	18	1.61
Nemouridae	18	1.61
Ephemerellidae	14	1.26
Chloroperlidae	14	1.26
Erpobdellidae	14	1.26
Scirtidae	13	1.17
Leuctridae	13	1.17
Heptageniidae	12	1.08
Gyrinidae	12	1.08
Coenagriidae	12	1.08
Chironomidae	12	1.08
Oligochaeta	9	0.81
Perlodidae	9	0.81
Taeniopterygidae	8	0.72
Odontoceridae	7	0.63
Sialidae	7	0.63
Piscicolidae	7	0.63
Brachycentridae	7	0.63
Calopterygidae	5	0.45
Hydrometridae	4	0.36
Beraeidae	4	0.36

Table 61 (continued)

Family	n	% of all missed taxa in 1996 audit
Corixidae	4	0.36
Gammaridae (incl. Crangonyctidae)	3	0.27
Ephemeroidea	3	0.27
Molannidae	3	0.27
Corophiidae	3	0.27
Aphelocheiridae	2	0.18
Perlidae	2	0.18
Dryopidae	2	0.18
Unionidae	2	0.18
Philopotamidae	2	0.18
Notonectidae	2	0.18
Capniidae	1	0.09
Cordulegasteridae	1	0.09
Siphonuridae	1	0.09
Gomphidae	1	0.09
Hirudinidae	1	0.09
Phryganeidae	1	0.09
Nepidae	1	0.09
Neritidae	1	0.09
Gerridae	1	0.09
TOTAL	1115	100.00

Table 62. Missed species for all samples in the 1996 audit

Species	n	% of all missed species in 1996 audit
Hydroptila sp.	42	3.57
Potamopyrgus jenkinsi (Smith)	41	3.48
Elmis aenea (Muller)	38	3.23
Hydraena gracilis Germar	35	2.97
Pisidium sp.	29	2.46
Simulium (Simulium) ornatum group	25	2.12
Ancylus fluviatilis Muller	23	1.95
Caenis rivulorum Eaton	20	1.70
Dendrocoelum lacteum (Muller)	20	1.70
Sericostoma personatum (Spence)	19	1.61
Valvata piscinalis (Muller)	18	1.53
Asellus aquaticus (L.)	18	1.53
Lepidostoma hirtum (Fabricius)	18	1.53
Lymnaea peregra (Muller)	17	1.44
Tinodes waeneri (L.)	16	1.36
Haliphus sp.	15	1.27
Chloroperla torrentium (Pictet)	14	1.19
Ephemerella ignita (Poda)	14	1.19
Oulimnius sp.	14	1.19
Dicranota sp.	13	1.10
Gyraulus albus (Muller)	12	1.02
Polycelis nigra/tenuis	12	1.02
Psychomyia pusilla (Fabricius)	12	1.02
Caenis luctuosa/macrura	12	1.02
Elodes sp.	12	1.02
Orectochilus villosus (Muller)	11	0.93
Mystacides azurea (L.)	10	0.85
Silo pallipes (Fabricius)	10	0.85
Hydropsyche siltalai Dohler	10	0.85
Polycelis felina (Dalyell)	10	0.85
Helophorus (Atracthelophorus) brevipalpis Bedel	10	0.85
Helobdella stagnalis (L.)	10	0.85
Orthoclaadiinae	10	0.85
Baetis rhodani (Pictet)	10	0.85
Valvata cristata Muller	10	0.85
Leuctra fusca (L.)	9	0.76
Glossiphonia complanata (L.)	9	0.76
Rhyacophila dorsalis (Curtis)	9	0.76
Simulium (Eusimulium) aureum group	9	0.76
Physa fontinalis (L.)	9	0.76
Hydropsyche sp.	9	0.76
Habrophlebia fusca (Curtis)	8	0.68
Oreodytes sanmarkii (Sahlberg)	8	0.68
Polycentropus flavomaculatus (Pictet)	8	0.68
Lymnaea sp.	8	0.68
Ecdyonurus sp.	8	0.68
Ithytrichia sp.	7	0.59
Silo sp.	7	0.59
Brachycentrus subnubilus Curtis	7	0.59
Pilaria (Pilaria) sp.	7	0.59

Table 62 (continued)

Species	n	% of all missed species in 1996 audit
<i>Goera pilosa</i> (Fabricius)	7	0.59
<i>Piscicola geometra</i> (L.)	7	0.59
<i>Odontocerum albicorne</i> (Scopoli)	7	0.59
<i>Agapetus</i> sp.	7	0.59
<i>Limnius volckmari</i> (Panzer)	7	0.59
<i>Ischnura elegans</i> (Van der Linden)	7	0.59
<i>Paraleptophlebia submarginata</i> (Stephens)	6	0.51
<i>Erpobdella octoculata</i> (L.)	6	0.51
Erpobdellidae indet	6	0.51
Limnephilidae indet	6	0.51
<i>Isoperla grammatica</i> (Poda)	6	0.51
<i>Athripsodes bilineatus</i> (L.)	6	0.51
<i>Lype</i> sp.	6	0.51
<i>Oxyethira</i> sp.	5	0.42
<i>Nemoura avicularis</i> Morton	5	0.42
<i>Brachyptera risi</i> (Morton)	5	0.42
<i>Physa acuta/heterostropha</i>	5	0.42
Coenagriidae indet	5	0.42
Sphaeriidae indet	5	0.42
Tubificidae	5	0.42
<i>Armiger crista</i> (L.)	5	0.42
<i>Tipula</i> (<i>Yamatotipula</i>) <i>montium</i> group	5	0.42
<i>Bathyomphalus contortus</i> (L.)	4	0.34
<i>Physa</i> sp.	4	0.34
<i>Anisus vortex</i> (L.)	4	0.34
<i>Leuctra inermis</i> Kempny	4	0.34
<i>Crunoecia irrorata</i> (Curtis)	4	0.34
<i>Asellus meridianus</i> Racovitza	4	0.34
<i>Glossosoma</i> sp.	4	0.34
<i>Athripsodes aterrimus</i> (Stephens)	4	0.34
<i>Baetis vernus</i> Curtis	4	0.34
<i>Oulimnius tuberculatus</i> (Muller)	4	0.34
<i>Plectrocnemia conspersa</i> (Curtis)	4	0.34
<i>Dugesia tigrina</i> (Girard)	4	0.34
<i>Athripsodes</i> sp.	4	0.34
<i>Plectrocnemia</i> sp.	4	0.34
<i>Haliphus lineatocollis</i> (Marsham)	3	0.25
<i>Agraylea multipunctata</i> Curtis	3	0.25
<i>Limnephilus</i> sp.	3	0.25
<i>Limnebius truncatellus</i> (Thunberg)	3	0.25
<i>Perlodes microcephala</i> (Pictet)	3	0.25
<i>Antocha vitripennis</i> (Meigen)	3	0.25
<i>Heptagenia sulphurea</i> (Muller)	3	0.25
<i>Cloeon dipterum</i> (L.)	3	0.25
<i>Haliphus fluviatilis</i> Aube	3	0.25
<i>Sialis fuliginosa</i> Pictet	3	0.25
<i>Sialis lutaria</i> (L.)	3	0.25
<i>Hydraena riparia</i> Kugelann	3	0.25
<i>Simulium</i> (<i>Nevermannia</i>) <i>cryophilum</i> group	3	0.25

Table 62 (continued)

Species	n	% of all missed species in 1996 audit
Simulium (Boophthora) erythrocephalum (deGeer)	3	0.25
Chironomini	3	0.25
Dugesia polychroa/lugubris	3	0.25
Rhyacophila sp.	3	0.25
Molanna angustata Curtis	3	0.25
Athripsodes cinereus (Curtis)	3	0.25
Ephemera sp.	3	0.25
Nemurella picteti Klapalek	3	0.25
Gammarus pulex (L.)	3	0.25
Tanytarsini	3	0.25
Hydropsyche angustipennis (Curtis)	3	0.25
Paraleptophlebia sp.	3	0.25
Glossiphonia heteroclita (L.)	3	0.25
Hydrometra sp.	3	0.25
Protonemura meyeri (Pictet)	3	0.25
Calopteryx splendens (Harris)	3	0.25
Taeniopteryx nebulosa (L.)	3	0.25
Dryops sp.	2	0.17
Agabus sp./Ilybius sp.	2	0.17
Halesus digitatus/radiatus	2	0.17
Enchytraeidae	2	0.17
Anacaena globulus (Paykull)	2	0.17
Amphinemura sulcicollis (Stephens)	2	0.17
Ecclisopteryx guttulata (Pictet)	2	0.17
Corophium curvispinum Sars	2	0.17
Simulium argyreatum/variegatum	2	0.17
Tanypodinae	2	0.17
Goeridae indet	2	0.17
Adicella reducta (Mclachlan)	2	0.17
Aphelocheirus aestivalis (Fabricius)	2	0.17
Calopteryx sp.	2	0.17
Beraeodes minutus (L.)	2	0.17
Beraea maurus (Curtis)	2	0.17
Lumbriculidae	2	0.17
Dugesia lugubris/polychroa	2	0.17
Protonemura sp.	2	0.17
Brychius elevatus (Panzer)	2	0.17
Nemoura cambrica/erratica	2	0.17
Nemoura sp.	2	0.17
Lymnaea truncatula (Muller)	2	0.17
Notonecta sp.	2	0.17
Lymnaea stagnalis (L.)	2	0.17
Polycentropus sp.	2	0.17
Planariidae indet	2	0.17
Simulium (Nevermannia) angustitarse group	2	0.17
Ilybius sp.	2	0.17
Sigara (Sigara) dorsalis (Leach)	2	0.17
Leptophlebiidae indet	2	0.17
Platambus maculatus (L.)	2	0.17
Baetis scambus group	2	0.17

Table 62 (continued)

Species	n	% of all missed species in 1996 audit
<i>Drusus annulatus</i> / <i>Ecclisopteryx guttulata</i>	1	0.08
<i>Athripsodes commutatus</i> (Rostock)	1	0.08
<i>Adicella</i> / <i>Triaenodes</i> group	1	0.08
<i>Baetis</i> sp.	1	0.08
<i>Agabus</i> sp.	1	0.08
<i>Drusus annulatus</i> (Stephens)	1	0.08
<i>Baetis scambus/fuscatus</i>	1	0.08
<i>Baetis buceratus</i> Eaton	1	0.08
<i>Austrolimnophila</i> sp.	1	0.08
<i>Athripsodes albifrons/bilineatus</i>	1	0.08
<i>Corophium multisetosum</i> Stock	1	0.08
<i>Cercyon</i> sp.	1	0.08
<i>Capnia</i> sp.	1	0.08
<i>Anacaena limbata</i> (Fabricius)	1	0.08
<i>Chloroperla tripunctata</i> (Scopoli)	1	0.08
<i>Anodonta</i> sp.	1	0.08
<i>Anacaena bipustulata</i> (Marsham)	1	0.08
<i>Colymbetinae</i> indet	1	0.08
<i>Athripsodes albifrons</i> (L.)	1	0.08
<i>Caenis luctuosa</i> group	1	0.08
<i>Dinocras cephalotes</i> (Curtis)	1	0.08
<i>Crenobia alpina</i> / <i>Phagocata vitta</i>	1	0.08
<i>Cyrnus flavidus</i> Mclachlan	1	0.08
<i>Anabolia nervosa</i> (Curtis)	1	0.08
<i>Caenis horaria</i> (L.)	1	0.08
<i>Ameletus inopinatus</i> Eaton	1	0.08
<i>Cyrnus trimaculatus</i> (Curtis)	1	0.08
<i>Bithynia tentaculata</i> (L.)	1	0.08
<i>Ceraclea</i> sp.	1	0.08
<i>Dicranota</i> (<i>Dicranota</i>) sp.	1	0.08
<i>Dina lineata</i> (Muller)	1	0.08
<i>Cordulegaster boltonii</i> (Donovan)	1	0.08
<i>Planorbidae</i> indet	1	0.08
<i>Prosimulium hirtipes/tomosvaryi</i>	1	0.08
<i>Erioptera</i> sp.	1	0.08
<i>Potamophylax cingulatus/latipennis</i>	1	0.08
<i>Potamonectes</i> sp.	1	0.08
<i>Potamonectes depressus/elegans</i>	1	0.08
<i>Mystacides nigra/longicornis</i>	1	0.08
<i>Polycelis</i> sp.	1	0.08
<i>Pseudanodonta complanata</i> (Rossmassler)	1	0.08
<i>Pilaria</i> sp.	1	0.08
<i>Pilaria</i> (<i>Neolimnomyia</i>) sp.	1	0.08
<i>Phryganeidae</i> indet	1	0.08
<i>Philopotamus montanus</i> (Donovan)	1	0.08
<i>Perla bipunctata</i> Pictet	1	0.08
<i>Oulimnius major</i> (Rey)	1	0.08
<i>Hydrophilidae</i> indet	1	0.08
<i>Nepa cinerea</i> L.	1	0.08
<i>Polycentropus flavomaculatus/kingi</i>	1	0.08

Table 62 (continued)

Species	n	% of all missed species in 1996 audit
Simulium (Wilhelmia) equinum (L.)	1	0.08
Trocheta sp.	1	0.08
Tipula sp.	1	0.08
Tinodes waeneri (L.), Lype sp.	1	0.08
Theodoxus fluviatilis (L.)	1	0.08
Sphaerium sp.	1	0.08
Prodiamesinae	1	0.08
Simulium (Wilhelmia) sp.	1	0.08
Psychomyiidae indet	1	0.08
Simulium (Simulium) reptans (L.)	1	0.08
Simulium (Simulium) argyreatum Meigen	1	0.08
Simulium (Nevermannia) vernum Macquart	1	0.08
Silo nigricornis (Pictet)	1	0.08
Sigara (Subsigara) falleni (Fieber)	1	0.08
Sialis sp.	1	0.08
Riolus subviolaceus (Muller)	1	0.08
Rhithrogena sp.	1	0.08
Simulium sp.	1	0.08
Helophorus (Helophorus) flavipes/obscurus	1	0.08
Heptagenia lateralis (Curtis)	1	0.08
Oreodytes davisii (Curtis)	1	0.08
Helophorus sp.	1	0.08
Helophorus flavipes/obscurus	1	0.08
Helophorus (Meghelophorus) grandis Illiger	1	0.08
Molophilus sp.	1	0.08
Helophorus (Helophorus) minutus Fabricius	1	0.08
Hippeutis complanatus (L.)	1	0.08
Halipilidae indet	1	0.08
Halesus radiatus (Curtis)	1	0.08
Haemopsis sanguisuga (L.)	1	0.08
Gyrinus sp.	1	0.08
Gyraulus albus (Muller)	1	0.08
Gomphus vulgatissimus (L.)	1	0.08
Glossiphoniidae indet	1	0.08
Gerris (Gerris) lacustris (L.)	1	0.08
Helophorus (Meghelophorus) aequalis Thomson	1	0.08
Leptophlebia marginata (L.)	1	0.08
Micronecta sp.	1	0.08
Lymnaea palustris/truncatula	1	0.08
Lymnaea palustris (Muller)	1	0.08
Lumbricidae	1	0.08
Limnophila (Eloeophila) sp.	1	0.08
Heptagenia lateralis (Curtis)	1	0.08
Limnephilidae	1	0.08
Hydraena riparia	1	0.08
Laccobius sp.	1	0.08
Hydropsyche contubernalis McLachlan	1	0.08
Wormaldia occipitalis (Pictet)	1	0.08
Hydroporus tessellatus Drapiez	1	0.08
Acroloxus lacustris (L.)	1	0.08

Table 62 (continued)

Species	n	% of all missed species in 1996 audit
Hydrometra stagnorum (L.)	1	0.08
Hydrocyphon deflexicollis (Muller)	1	0.08
Hydrobius fuscipes (L.)	1	0.08
Limnephilus extricatus Mclachlan	1	0.08
TOTAL	1177	100.00