



An audit of performance in the analysis of biological samples in 1995

NRA North West Region: Primary Audit

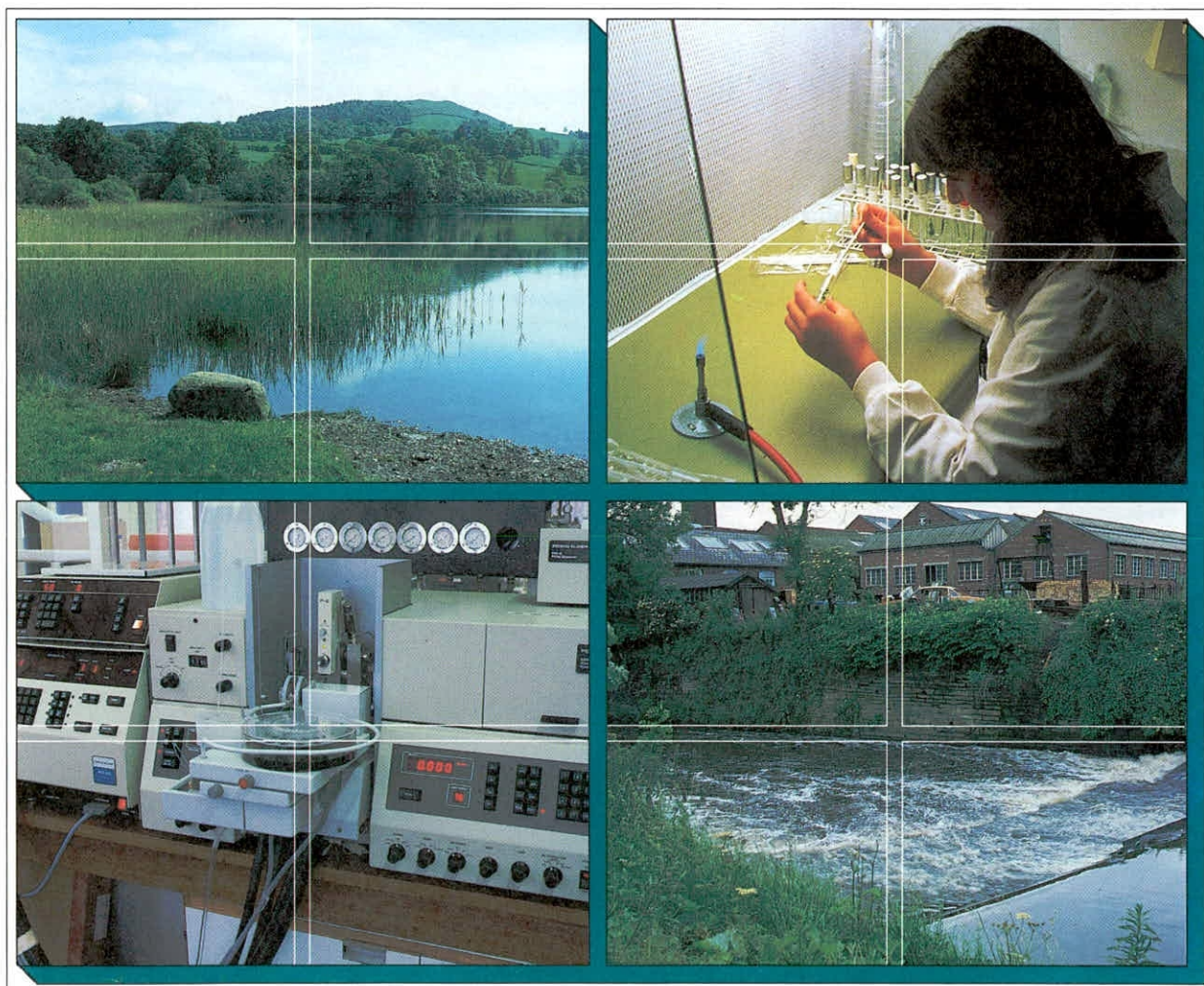
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Report To:
IFE Report Ref. No:

National Rivers Authority, North West Region
RL/T04071o7/05





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NRA North West Region: Primary Audit

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Report Date:
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June 1996
National Rivers Authority, North West Region
RL/T04071o7/05

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1. INTRODUCTION

The 1995 General Quality Assessment (GQA) Survey included the sampling of aquatic macro-invertebrates for biological assessment of river quality throughout the United Kingdom. In England and Wales the survey was undertaken by the National Rivers Authority (NRA), the River Purification Boards (RPBs) sampled in Scotland, the Industrial Research and Technology Unit (IRTU) undertook the work in Northern Ireland and the Government Laboratory covered the Isle of Man (IOM).

The majority of sites surveyed were sampled in two seasons, spring and autumn. Standard collection procedures were used and the sampling strategy was 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 order to undertake this massive programme of fieldwork and sample processing, a large number of staff, many of whom were relatively inexperienced, were employed by the surveying agencies. 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) checker. For most agencies, these checkers re-sorted about 10% of the laboratory's samples, those samples chosen for re-sorting being selected at random. In addition, IFE was contracted to undertake an independent, external audit of the quality of the laboratory analysis of biological samples for each NRA region, each RPB, IRTU and IOM. This commission was consistent with the audit performed by IFE for the National River Quality Survey in 1990 and for the routine biological monitoring of river sites each year between 1991 and 1994. This audit was originally intended as a measure of the quality of the AQC analyses and is termed the main audit or AQC audit. The data collected for the 1995 GQA Survey was not adjusted for errors identified by either of the quality assurance procedures. Therefore the NRA contracted IFE to subject their samples to a further audit of the primary analysis (the primary audit) to provide an independent assessment of the quality of the Survey data.

This report presents the results of the 60 samples audited for NRA North West Region and represents a measure of the performance of the primary analyst rather than that of the AQC analyst. The results of the AQC Audit, detailing the performance of the biologists who analysed the 42 AQC'd samples for the Region, are reported separately.

2. SAMPLE SELECTION

Samples for audit were selected internally by each of the agencies being monitored. The number of samples selected for audit varied between the different agencies and the biologists processing these samples had no prior knowledge of which samples were to be audited. Some agencies only sent to IFE samples that had been processed twice. Others adopted a random selection process, whereby some samples had been analysed just once and some had been re-sorted. 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 NRA, RPB, IRTU and IOM biologists was to sort their samples within the laboratory and to select examples of each scoring taxon within the BMWP system. In most cases, 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. Thus, 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 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 vial of animals, and the BMWP families identified.
- b) The families contained within the vial 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 vial 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 Regional Biologist. Copies of these report forms are presented in the Appendix. 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". 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, the wrong family box being ticked on the data sheet or the family being present in the sample but missed by IFE.

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.

5. RESULTS

The results of the Primary audit for North West Region are summarised by area in Tables 1 to 3. Table 4 displays 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 analyst, for their Area laboratories and for the Region as a whole. Table 5 compares these results for each NRA Region and Area laboratory. Table 6 presents data for North West Region for the net effects of the Primary audit on the BMWP score and number of taxa. This table is 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. Table 7 compares this BMWP data for each NRA Region and Area laboratory. Table 8 lists the taxa missed in sorting by North West Region's primary analysts in the 1995 audit. A listing of all such taxa for the entire 1995 audit (Primary and AQC Audits for NRA regions and Main Audit for other organisations) for the whole of the UK is presented in the AQC audit report.

6. ACKNOWLEDGEMENTS

Grateful thanks to John Murray-Bligh of NRA Thames Region, who provided an invaluable service in the development and implementation of improved methodology and in providing helpful advice throughout.

Table 1. The 18 samples audited for Northern Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Roe	Thrangholm Bridge	AJ	0	1	0
Trout Beck	ptc Windermere	BJI	0	1	0
Well Sike	NY 372 646	DS	0	0	1
Calthwaite Beck	ptc R.Petteril	DS	0	2	0
Briggle Beck	NY 583 341	DS	0	4	0
Eden	Appleby	DS	0	5	1
Church Beck	A593 Bridge, u/s STW	KJR	0	1	0
New Mills Beck	d/s Golf Links	NC	0	2	2
Keekle	Keekle Grove	NC	0	1	0
Gilpin	Dawson Fold	NC	0	2	0
AUTUMN					
Petteril	Stoneyholme	AG	2	7	0
Cargo Beck	NY 372 591	AG	0	0	0
Eden	ptc R.Petteril	AG	3	2	0
Gill Beck	d/s Blindcrake STW	AJ	0	4	1
Derwent Tributary	d/s Greysouthen STW	AJ	1	1	0
Caldew	ptc R.Eden	AJ	1	4	0
Church Beck	A593 Bridge, u/s STW	BJI	0	3	0
Well Sike	NY 372 646	DS	0	0	0

Table 2. The 20 samples audited for Central Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Yarrow	Site No 27	ADE	0	0	0
Skirden Beck	ptc Holden Beck	EIG	1	1	0
Keer	d/s Railway viaduct	JAW	0	4	0
Darwen	u/s Darwen STW	JAW	0	1	0
Lune	d/s Forge Weir	JAW	0	4	0
Carr Brook	ptc River Lostock	JAW	0	4	0
Hyndburn	Site No 200	KE	0	1	0
Hennel Brook	ptc River Darwen	LMcG	0	2	0
Fen Beck	d/s Waters Bridge	SLP	0	4	1
AUTUMN					
Stock Beck	Horton Bridge	ADE	0	4	0
Davyfield Brook	ptc R.Darwen	ADE	2	0	0
Cant Beck	d/s A683 Bridge	ADE	0	4	0
Sharoe Brook	ptc Savick Brook	AM	0	1	0
Darwen	Cann Bridge	AM	0	0	0
Ribble	Brockholes Bridge	AM	0	1	0
Poolstock Brook	d/s Scotsmans Flash	JEL	0	1	0
Crossens	Crossens P.S.	KC	0	2	0
Douglas	ptc Pearl Brook	KC	0	1	0
Lostock	Earnshaw Bridge	PLM	1	5	0
Wyre	d/s St.Michaels Bridge	PLM	1	7	1

Table 3. The 22 samples audited for Southern Area

River	Site	Primary Analyst	Losses	Gains	Omissions
SPRING					
Kidsgrove Stream	ptc R.Wheelock	JB	0	1	0
Kinder	ptc R.Sett	JB	0	6	0
Gowy	Gowy Bridge	KW	0	7	0
Rossendale Brook	ptc R.Bollin	KW	0	5	0
Worsley Brook	Barnton	MW	1	1	0
Micker Brook	ptc R.Mersey	PN	0	6	1
Valley Brook	u/s Rof Tributary	SJ	1	3	0
Tame	d/s Readycon Dean Reservoir	SL	1	3	0
Whittle Brook	ptc Union Bank Brook	TP	0	3	0
Millingford Brook	u/s Newton Lake	TP	0	1	0
AUTUMN					
Randall Carr Brook	Cadster	AG	1	4	0
Roch	u/s Rochdale ETW	AG	0	0	0
Whitewell Brook	ptc Shawclough Brook	CB	0	8	0
Arrowe Brook	ptc The Birket	GM	0	3	0
Biddulph Brook	u/s Biddulph ETW	JB	1	0	0
Weaver	Wrenbury	JB	0	2	0
Checkley Brook	ptc R.Lea	KW	0	1	0
Crowton Brook	Crowton Mill	KW	3	1	0
Luzley Brook	u/s Royton ETW	MW	0	3	0
Fowle Brook	u/s R.Wheelock	PN	0	1	0
Valley Brook	Foxley	SJ	0	0	0
Pedley Brook	ptc Birkin Brook	SL	0	5	0

Table 4. Statistics of 1995 Primary Audit results for North West 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
Northern	18	2.22	0.45	6	33.33	7	2.89	0.57
AG*	3	3.00	2.08	1	33.33	7	4.67	2.60
AJ	4	2.50	0.87	2	50.00	4	3.25	1.03
BJI	2	2.00	1.00	1	50.00	3	2.00	1.00
DS	5	2.20	1.02	2	40.00	5	2.60	1.08
KJR	1	1.00	n/a	0	0.00	1	1.00	n/a
NC	3	1.67	0.33	0	0.00	2	2.33	0.88
Central	20	2.35	0.44	8	40.00	7	2.70	0.51
ADE	4	2.00	1.15	2	50.00	4	2.50	0.96
AM	3	0.67	0.33	0	0.00	1	0.67	0.33
EIG	1	1.00	n/a	0	0.00	1	2.00	n/a
JAW	4	3.25	0.75	3	75.00	4	3.25	0.75
JEL	1	1.00	n/a	0	0.00	1	1.00	n/a
KC	2	1.50	0.50	0	0.00	2	1.50	0.50
KE	1	1.00	n/a	0	0.00	1	1.00	n/a
LMcG	1	2.00	n/a	0	0.00	2	2.00	n/a
PLM	2	6.00	1.00	2	100.00	7	7.50	1.50
SLP	1	4.00	n/a	1	100.00	4	5.00	n/a
Southern	22	2.91	0.51	12	54.55	8	3.32	0.51
AG*	2	2.00	2.00	1	50.00	4	2.50	2.50
CB	1	8.00	n/a	1	100.00	8	8.00	n/a
GM	1	3.00	n/a	1	100.00	3	3.00	n/a
JB	4	2.25	1.31	1	25.00	6	2.50	1.19
KW	4	3.50	1.50	2	50.00	7	4.25	1.25
MW	2	2.00	1.00	1	50.00	3	2.50	0.50
PN	2	3.50	2.50	1	50.00	6	4.00	3.00
SJ	2	1.50	1.50	1	50.00	3	2.00	2.00
SL	2	4.00	1.00	2	100.00	5	4.50	0.50
TP	2	2.00	1.00	1	50.00	3	2.00	1.00
*AG moved from Northern Area to Southern Area								
AG combined data	5	2.60	1.33	2	40.00	7	3.80	1.71
North West Region	60	2.52	0.27	26	43.33	8	2.98	0.30
Whole of NRA	481	1.88	0.08	150	31.19	8	2.21	0.09

Table 5. Summary of errors found in 1995 Primary Audit for each NRA Laboratory

Region/Lab.	n	Mean gains	Standard error	No.samples >2 gains	% samples >2 gains	Highest no. gains	Mean errors (l+g+o)	Standard error
Anglian	60	2.25	0.20	24	40.00	6	2.63	0.22
Central	20	2.25	0.35	6	30.00	5	3.00	0.42
Eastern	20	2.85	0.39	11	50.00	6	3.05	0.38
Northern	20	1.65	0.27	7	35.00	3	1.85	0.27
N'umb & Yorks	60	1.52	0.20	12	20.00	6	1.68	0.21
South Yorkshire	27	1.44	0.28	5	18.52	6	1.63	0.29
Northumbria	17	1.12	0.26	2	11.76	3	1.29	0.31
Dales	16	2.06	0.50	5	31.25	6	2.19	0.51
North West	60	2.52	0.27	26	43.33	8	2.98	0.30
Northern	18	2.22	0.45	6	33.33	7	2.89	0.57
Central	20	2.35	0.44	8	40.00	7	2.70	0.51
Southern	22	2.91	0.51	12	54.55	8	3.32	0.51
Severn-Trent	61	1.84	0.22	18	29.51	8	1.23	0.27
Upper Severn	16	1.50	0.41	5	31.25	5	1.88	0.60
Lower Severn	13	1.85	0.52	4	30.77	5	2.46	0.63
Upper Trent	13	1.69	0.41	3	23.08	5	1.92	0.42
Lower Trent	19	2.21	0.43	6	31.58	8	2.58	0.50
Southern	60	1.33	0.19	10	16.67	7	1.77	0.21
Western	30	1.20	0.26	5	16.67	6	1.60	0.27
Eastern	30	1.47	0.28	5	16.67	7	1.93	0.33
South Western	60	1.52	0.21	16	26.67	6	1.63	0.23
Devon	16	1.56	0.33	5	31.25	4	1.63	0.35
Cornwall	15	1.27	0.42	3	20.00	5	1.33	0.45
North Wessex	13	0.92	0.29	1	7.69	3	0.92	0.29
South Wessex	16	2.19	0.52	7	43.75	6	2.50	0.58
Thames	60	2.05	0.22	22	36.67	7	2.43	0.24
Fobney Mead	30	2.43	0.32	16	53.33	6	2.97	0.35
Waltham Cross	30	1.67	0.29	6	20.00	7	1.90	0.29
Welsh	60	1.98	0.22	22	36.67	6	2.30	0.23
Northern	20	2.20	0.40	9	45.00	6	2.65	0.39
South Western	20	1.75	0.40	5	25.00	6	2.10	0.41
South Eastern	20	2.00	0.37	8	40.00	5	2.15	0.39
Whole of NRA	481	1.88	0.08	150	31.19	8	2.21	0.09

Table 6. Net effects of the Primary Audit on BMWP score and number of scoring taxa

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	18	12.50	44.44	33	1.83	33.33	5
AG*	3	8.67	33.33	26	1.33	33.33	5
AJ	4	15.00	50.00	33	2.00	50.00	4
BJI	2	10.00	0.00	13	2.00	50.00	3
DS	5	13.80	60.00	27	2.20	40.00	5
KJR	1	10.00	0.00	10	1.00	0.00	1
NC	3	13.33	33.33	20	1.67	0.00	2
Central	20	13.00	35.00	39	2.10	40.00	6
ADE	4	11.25	50.00	26	1.50	50.00	4
AM	3	3.00	0.00	6	0.67	0.00	1
EIG	1	-4.00	0.00	-4	0.00	0.00	0
JAW	4	21.50	75.00	34	3.25	75.00	4
JEL	1	10.00	0.00	10	1.00	0.00	1
KC	2	11.50	0.00	13	1.50	0.00	2
KE	1	7.00	0.00	7	1.00	0.00	1
LMcG	1	8.00	0.00	8	2.00	0.00	2
PLM	2	25.50	50.00	39	5.00	100.00	6
SLP	1	25.00	100.00	25	4.00	100.00	4
Southern	22	13.50	45.45	49	2.55	45.45	8
AG*	2	8.00	50.00	16	1.50	50.00	3
CB	1	49.00	100.00	49	8.00	100.00	8
GM	1	16.00	100.00	16	3.00	100.00	3
JB	4	11.50	50.00	33	2.00	25.00	6
KW	4	14.25	50.00	34	2.75	50.00	7
MW	2	4.50	0.00	9	1.50	50.00	3
PN	2	15.00	50.00	25	3.50	50.00	6
SJ	2	3.00	0.00	6	1.00	0.00	2
SL	2	27.00	100.00	34	3.50	50.00	5
TP	2	7.00	0.00	11	2.00	50.00	3
AG* combined data	5	8.40	40.00	26	1.40	40.00	5
N.West Region	60	13.03	41.67	49	2.18	40.00	8
Whole of NRA	481	9.56	28.90	52	1.65	27.86	8

Table 7. Net effects of the Primary Audit on BMWP score and number of scoring taxa for each NRA Area

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
Anglian Region	60	10.32	35.00	37	1.98	35.00	6
Central	20	9.45	30.00	24	1.85	25.00	5
Eastern	20	14.35	55.00	37	2.65	55.00	6
Northern	20	7.15	20.00	18	1.45	30.00	3
N & Y Region	60	8.35	16.67	40	1.45	18.33	6
S. Yorkshire	27	7.33	14.81	35	1.37	18.52	6
Northumbria	17	5.41	5.88	20	1.00	5.88	3
Dales	16	13.19	31.25	40	2.06	31.25	6
N.West Region	60	13.03	41.67	49	2.18	40.00	8
Northern	18	12.50	44.44	33	1.83	33.33	5
Central	20	13.00	35.00	39	2.10	40.00	6
Southern	22	13.50	45.45	49	2.55	45.45	8
S-T Region	61	8.69	27.87	41	1.64	27.87	7
Upper Severn	16	8.44	25.00	33	1.31	25.00	4
Lower Severn	13	6.77	23.08	30	1.54	30.77	5
Upper Trent	13	9.23	23.08	41	1.62	23.08	5
Lower Trent	19	9.84	36.84	36	2.00	31.58	7
Southern Region	60	6.62	20.00	52	1.02	15.00	6
Western	30	5.33	13.33	32	0.90	13.33	6
Eastern	30	7.90	40.00	52	1.13	16.67	6
S.W.Region	60	8.43	30.00	35	1.42	23.33	6
Devon	16	9.25	37.50	28	1.50	25.00	4
Cornwall	15	7.87	26.67	35	1.20	30.00	5
N.Wessex	13	4.54	15.38	16	0.85	6.25	3
S.Wessex	16	11.31	37.50	33	2.00	37.50	6
Thames Region	60	9.18	26.67	47	1.78	31.67	7
Fobney Mead	30	11.00	40.00	47	2.10	46.67	6
Waltham Cross	30	7.37	13.33	42	1.47	16.67	7
Welsh Region	60	11.87	33.33	43	1.73	31.67	6
Northern	20	12.45	45.00	43	1.85	35.00	6
S.Western	20	9.45	20.00	37	1.40	20.00	6
S.Eastern	20	13.70	35.00	38	1.95	40.00	5
Whole of NRA	481	9.56	28.90	52	1.65	27.86	8

Table 8. Taxa missed by North West Region's primary analysts

Family	n	% of N.West Region's missed taxa in Primary Audit	% of missed taxa in Primary Audit for all NRA Regions
Hydrobiidae (incl. Bithyniidae)	13	9.49	4.98
Sphaeriidae	10	7.30	4.63
Hydrophilidae (incl. Hydraenidae)	9	6.57	5.46
Caenidae	7	5.11	3.56
Planariidae (incl. Dugesiidae)	7	5.11	4.27
Nemouridae	6	4.38	2.25
Goeridae	5	3.65	1.78
Hydroptilidae	5	3.65	5.93
Leptoceridae	5	3.65	3.68
Limnephilidae	5	3.65	2.61
Elmidae	4	2.92	4.03
Asellidae	3	2.19	1.66
Dytiscidae (incl. Noteridae)	3	2.19	1.90
Glossiphoniidae	3	2.19	1.66
Halplidae	3	2.19	2.02
Hydropsychidae	3	2.19	1.66
Leptophlebiidae	3	2.19	1.54
Leuctridae	3	2.19	0.95
Perlidae	3	2.19	0.47
Baetidae	2	1.46	2.25
Beraeidae	2	1.46	0.24
Ephemerellidae	2	1.46	1.54
Lymnaeidae	2	1.46	2.49
Oligochaeta	2	1.46	0.71
Physidae	2	1.46	0.83
Piscicolidae	2	1.46	1.90
Psychomyiidae (incl. Ecnomidae)	2	1.46	2.85
Sericostomatidae	2	1.46	1.07
Tipulidae	2	1.46	2.25
Ancylidae (incl. Acroloxidae)	1	0.73	1.66
Chironomidae	1	0.73	0.59
Chloroperlidae	1	0.73	0.47
Coenagriidae	1	0.73	0.71

Table 8. (cont.)

Family	n	% of N. West Region's missed taxa in Primary Audit	% of missed taxa in Primary Audit for all NRA Regions
Ephemeridae	1	0.73	0.47
Erpobdellidae	1	0.73	1.42
Gammaridae (incl. Crangonyctidae)	1	0.73	0.95
Gyrinidae	1	0.73	1.19
Heptageniidae	1	0.73	0.83
Lepidostomatidae	1	0.73	1.07
Odontoceridae	1	0.73	0.83
Planorbidae	1	0.73	2.85
Sialidae	1	0.73	0.36
Siphonuridae	1	0.73	0.24
Taeniopterygidae	1	0.73	0.47
Unionidae	1	0.73	0.47
Valvatidae	1	0.73	2.14

APPENDIX

Results of individual sample audits

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 13.3.95

WATER-
COURSE: Roe

PRIMARY
ANALYST: AJ

AQC
ANALYST: NC

SITE: Thrangholm Bridge

CODE: NRA03 012c

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	9
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 12.4.95

WATER-
COURSE: Trout Beck

PRIMARY
ANALYST: BJI

AQC
ANALYST: NC

SITE: ptc Windermere

CODE: NRA03 19ak

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Caenidae	Caenis rivulorum 1 only	11
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 7

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 2.3.95

WATER-
COURSE: Well Sike

PRIMARY
ANALYST: DS

AQC
ANALYST:

SITE: NY 372 646

CODE: NRA03 Oubo

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Baetidae * 1

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Baetidae * Baetis rhodani 1

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 0
ON NO. OF TAXA 0

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 2.3.95

WATER-

PRIMARY

AQC

COURSE: Calthwaite Beck

ANALYST: DS

ANALYST: NC

SITE: ptc R.Petteril

CODE: NRA03 0m58

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Leptophlebiidae

Habrophlebia fusca 1 only

11

Tipulidae

Limonia sp. 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 22.3.95

WATER-

PRIMARY

AQC

COURSE: Briggie Beck

ANALYST: DS

ANALYST: NC

SITE: NY 583 341

CODE: NRA03 0ha8

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Beraeidae	Beraea maurus	11
Goeridae	Silo pallipes	11
Piscicolidae	Piscicola geometra	11
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 27

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 13.4.95

WATER-

PRIMARY

AQC

COURSE: Eden

ANALYST: DS

ANALYST: NC

SITE: Appleby

CODE: NRA03 Oeco

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Hydrophilidae (incl. Hydraenidae) *	Esolus parallelepipedus (adult)	7
-------------------------------------	---------------------------------	---

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae) *	Hydraena gracilis (adult) 1 only	12
Perlidae	Perla bipunctata 1 only	11
Hydroptilidae	Ithytrichia sp.	11
Planariidae (incl. Dugesidae)	Polycelis felina 1 only	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi 1 only	11
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 5

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 27

ON NO. OF TAXA 5

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 10.4.95

WATER-
COURSE: Church Beck

PRIMARY
ANALYST: KJR

AQC
ANALYST:

SITE: A593 Bridge, u/s STW

CODE: NRA03 1a54

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Odontoceridae

Odontocerum albicorne 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 7.3.95

WATER-
COURSE: New Mills Beck

PRIMARY
ANALYST: NC

AQC
ANALYST: NC

SITE: d/s Golf Links

CODE: NRA03 01e0

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Goeridae *	5
Nemouridae *	1

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Nemouridae *	Nemoura cambrica/erratica, Amphinemura sp. (damaged specimen)	1
Taeniopterygidae	Brachyptera risi	11
Beracidae	Beracodes minutus	9
Goeridae *	Silo pallipes	5

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 2

NET EFFECTS:

ON BMWP SCORE 20

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

3 Posterior end only in vial

7 Mis-identification

4 Empty shell or case or cast skin in vial

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 21.3.95

WATER-
COURSE: Keekle

PRIMARY
ANALYST: NC

AQC
ANALYST: NC

SITE: Keekle Grove

CODE: NRA03 02cq

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	11
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 20.3.95

WATER-
COURSE: Gilpin

PRIMARY
ANALYST: NC

AQC
ANALYST:

SITE: Dawson Fold

CODE: NRA03 17fw

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Tipulidae

Pilaria (Pilaria) sp.

6

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sericostomatidae

Sericostoma personatum 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 4.9.95

WATER-
COURSE: Petteril

PRIMARY
ANALYST: AG

AQC
ANALYST: AJ

SITE: Stoneyholme

CODE: NRA03 Olls

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)		5
Lepidostomatidae	Anabolia nervosa	7

Additional BMWP taxa found by IFE

Limnephilidae	Anabolia nervosa	7
---------------	------------------	---

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Physidae	Physa fontinalis	11
Caenidae	Caenis luctuosa/macrura	11
Hydroptilidae	Hydroptila sp. (pupa) 1 only	11
Planariidae (incl. Dugesiidae)	Polycelis nigra/tenuis 1 only	11
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11
Leuctridae	Leuctra fusca	11

SUMMARY OF AUDIT

LOSSES 2

GAINS 7

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 26

ON NO. OF TAXA 5

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 8.9.95

WATER-
COURSE: Cargo Beck

PRIMARY
ANALYST: AG

AQC
ANALYST: NC

SITE: NY 372 591

CODE: NRA03 0jtw

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 4.9.95

WATER-
COURSE: Eden

PRIMARY
ANALYST: AG

AQC
ANALYST:

SITE: ptc R.Petteril

CODE: NRA03 0etc

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Tipulidae	1
Oligochaeta	1
EphemereUidae	5

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydroptilidae	Indet Hydroptilid (pupa) 1 only	9
Goeridae	Goera pilosa 1 only	9

SUMMARY OF AUDIT

LOSSES 3

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA -1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 5.10.95

WATER-
COURSE: Gill Beck

PRIMARY
ANALYST: AJ

AQC
ANALYST: NC

SITE: d/s Blindcrake STW

CODE: NRA03 06k4

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Hydrobiidae (incl. Bithyniidae) *

4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Nemouridae	Nemoura avicularis 1 only	9
Limnephilidae	Indet Limnephilid (juvenile) 1 only	11
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	9
Hydrobiidae (incl. Bithyniidae) *	Potamopyrgus jenkinsi	4
Sphaeriidae	Pisidium sp. 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 22

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West	LABORATORY: Northern	DATE: 6.11.95
WATER-COURSE: Derwent Tributary	PRIMARY ANALYST: AJ	AQC ANALYST: AJ
SITE: d/s Greysouthen STW	CODE: NRA03 05ms	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)

4

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Planariidae (incl. DugesIIDae)

Indet Planariids. There is some doubt about the validity of this record. Benefit of doubt given to AQC analyst.

11

SUMMARY OF AUDIT

LOSSES 1 GAINS 1 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 22.11.95

WATER-

PRIMARY

AQC

COURSE: Caldew

ANALYST: AJ

ANALYST:

SITE: ptc R.Eden

CODE: NRA03 0k28

SORT/AQC

METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Dendrocoelidae	Dugesia tigrina	7
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Additional BMWP taxa found by IFE

Psychomyiidae (incl. Ecnomidae)	Psychomyia pusilla	6
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Lepidostomatidae	Lepidostoma hirtum 1 only	9
Goeridae	Goera pilosa 1 only	9
Leuctridae	Leuctra hippopus 1 only	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 33

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 30.10.95

WATER-

PRIMARY

AQC

COURSE: Church Beck

ANALYST: BJI

ANALYST:

SITE: d/s A593 Bridge, u/s STW

CODE: NRA03 1a54

SORT/AQC

METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Sphaeriidae	Pisidium sp. 1 only	9
Elmidae	Elmis aenea (larva) 1 only	9
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Northern

DATE: 11.10.95

WATER-
COURSE: Well Sike

PRIMARY
ANALYST: DS

AQC
ANALYST: AJ

SITE: NY 372 646

CODE: NRA03 Oubo

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 4.5.95

WATER-
COURSE: Yarrow

PRIMARY
ANALYST: ADE

AQC
ANALYST:

SITE: Site No 27

CODE: 27

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 28.4.95

WATER-
COURSE: Ribble

PRIMARY
ANALYST: EIG

AQC
ANALYST: SLP

SITE: Skirden Beck ptc Holden Beck

CODE: 273/S9514

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

Hydrophilidae (incl. Hydraenidae)

Esolus parallepipedus (adult)

7

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Oligochaeta

Tubificidae

11

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -4

ON NO. OF TAXA 0

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 21.4.95

WATER-

PRIMARY

AQC

COURSE: Keer

ANALYST: JAW

ANALYST: JEL

SITE: d/s Railway viaduct

CODE: 493/S9501

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Caenidae	Caenis rivulorum 1 only	9
Nemouridae	Amphinemura sulcicollis 1 only	9
Goeridae	Silo pallipes 1 only	9
Sericostomatidae	Sericostoma personatum 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 34

ON NO. OF TAXA 4

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 17.5.95

WATER-
COURSE: Darwen

PRIMARY
ANALYST: JAW

AQC
ANALYST: EIG

SITE: u/s STW, d/s Paper Mill

CODE: 92/S9511

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11
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SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 20.4.95

WATER-
COURSE: Lune

PRIMARY
ANALYST: JAW

AQC
ANALYST: JAW

SITE: d/s Forge Weir

CODE: 409/S9516

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Perlidae	Dinocras cephalotes 1 only	9
Nemouridae	Amphinemura sulcicollis 1 only	11
Gammaridae (incl. Crangonyctidae)	Gammarus pulex 1 only	11
Gyrinidae	Orectochilus villosus (larva) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 28

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 22.5.95

WATER-
COURSE: Lostock

PRIMARY
ANALYST: JAW

AQC
ANALYST: JAW

SITE: Carr Brook, ptc River Lostock

CODE: S9524/45

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Tipulidae	Dicranota sp. 1 only	11
Planariidae (incl. Dugesiiidae)	Polycelis felina 1 only	9
Psychomyiidae (incl. Ecnomidae)	Tinodes waeneri 1 only	9
Sphaeriidae	Pisidium sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 21

ON NO. OF TAXA 4

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 20.3.95

WATER-

PRIMARY

AQC

COURSE: Hyndburn

ANALYST: KE

ANALYST:

SITE: Site No 200

CODE: 200

SORT/AQC

METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Nemouridae

Nemoura cambrica/erratica 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 7

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 4.5.95

WATER-

PRIMARY

AQC

COURSE: Darwen

ANALYST: LMcG

ANALYST:

SITE: Hennel Bk, ptc River Darwen

CODE: 128.24

SORT/AQC

METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)

Helophorus brevipalpis (adult) 1 only

9

Hydrobiidae (incl. Bithyniidae)

Potamopyrgus jenkinsi 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 8

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 12.4.95

WATER-
COURSE: Lune

PRIMARY
ANALYST: SLP

AQC
ANALYST: SLP

SITE: Fen Beck d/s Waters Bridge

CODE: 464/S9518

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Sericostomatidae * 1

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Sericostomatidae *	Sericostoma personatum 1 only	1
Caenidae	Caenis rivulorum	9
Limnephilidae	Ecclisopteryx guttulata 1 only	11
Ancylidae (incl. Acroloxidae)	Ancylus fluviatilis 1 only	9
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 25

ON NO. OF TAXA 4

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 11.10.95

WATER-
COURSE: Ribble

PRIMARY
ANALYST: ADE

AQC
ANALYST:

SITE: Stock Beck at Horton Bridge

CODE: 270

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Baetidae	Baetis scambus/fuscatus, B. vernus	9
Haliplidae	Halipus sp. (larva) 1 only	9
Perlidae	Dinocras cephalotes 1 only	9
Caenidae	Caenis luctuosa group 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 26

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 1.11.95

WATER-

PRIMARY

AQC

COURSE: Darwen

ANALYST: ADE

ANALYST: EIG

SITE: Davyfield Brook ptc R.Darwen

CODE: S9535/109

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Sphaeriidae 12

Erpobdellidae 12

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 2

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -6

ON NO. OF TAXA -2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 14.9.95

WATER-
COURSE: Lune

PRIMARY
ANALYST: ADE

AQC
ANALYST:

SITE: Cant Beck d/s A683 Bridge

CODE: 463

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
-------------	-------------------------------------	---

VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Erpobdellidae	Indet Erpobdellid (juvenile) 1 only	9
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adult) 1 only	9
Limnephilidae	Indet pupa (Drusus annulatus?) 1 only	9
Leptoceridae	Mystacides azurea 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 25

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 24.10.95

WATER-
COURSE: Savick

PRIMARY
ANALYST: AM

AQC
ANALYST:

SITE: Sharoe Brook ptc Savick Brook

CODE: 66

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Asellidae

Asellus aquaticus 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 6.11.95

WATER-
COURSE: Darwen

PRIMARY
ANALYST: AM

AQC
ANALYST: JAW

SITE: Cann Bridge

CODE: S9539/101

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 2.10.95

WATER-

PRIMARY

AQC

COURSE: Ribble

ANALYST: AM

ANALYST: JAW

SITE: Brockholes Bridge

CODE: S9554/257

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydroptilidae

Hydroptila sp.

11

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 3.10.95

WATER-
COURSE: Douglas

PRIMARY
ANALYST: JEL

AQC
ANALYST: JEL

SITE: Poolstock Brk d/s Scotsmans Flash CODE: S9549/682

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Leptoceridae	Athripsodes aterrimus 1 only	11
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SUMMARY OF AUDIT

LOSSES 0 GAINS 1 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 21.9.95

WATER-

PRIMARY

AQC

COURSE: Crossens

ANALYST: KC

ANALYST: JEL

SITE: The Sluice, Crossens P.S.

CODE: S9552/766

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Unionidae	Anodonta cygnaea 1 only	11
Caenidae	Caenis horaria 1 only	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 13

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 2.10.95

WATER-
COURSE: Douglas

PRIMARY
ANALYST: KC

AQC
ANALYST: EIG

SITE: d/s M61 ptc Pearl Brook

CODE: S9553/663

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Leptoceridae

Mystacides azurea 1 only

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 10

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 12.10.95

WATER-

PRIMARY

AQC

COURSE: Lostock

ANALYST: PLM

ANALYST:

SITE: Earnshaw Bridge

CODE: 40

SORT/AQC

METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Elmidae	Haliphus sp. (larvae)	7
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Additional BMWP taxa found by IFE

Hirudinidae	Haemopsis sanguisuga	7
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Halipidae	Haliphus sp. (larvae)	7
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Piscicolidae	Piscicola geometra	6
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Valvatidae	Valvata cristata	9
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Chironomidae	Orthocladinae 1 only	9
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SUMMARY OF AUDIT

LOSSES 1

GAINS 5

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 12

ON NO. OF TAXA 4

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Central

DATE: 12.10.95

WATER-
COURSE: Wyre

PRIMARY
ANALYST: PLM

AQC
ANALYST:

SITE: d/s St.Michaels Bridge

CODE: 323

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Sericostomatidae *	Athripsodes cinereus	7
Planariidae (incl. Dugesiiidae)	Dendrocoelum lacteum	7

Additional BMWP taxa found by IFE

Dendrocoelidae	Dendrocoelum lacteum	7
Leptoceridae	Athripsodes cinereus	7

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydropsychidae	Hydropsyche pellucidula 1 only	9
Goeridae	Goera pilosa	9
Glossiphoniidae	Helobdella stagnalis 1 only	9
Sericostomatidae *	Sericostoma personatum	7
Haliplidae	Halipus sp. (larva) 1 only	9
Hydroptilidae	Hydroptila sp. (pupae)	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 7

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 39

ON NO. OF TAXA 6

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 29.3.95

WATER-

PRIMARY

AQC

COURSE: Kidsgrove Stream

ANALYST: JB

ANALYST: SL

SITE: ptc R.Wheelock

CODE: my5o (707)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Oligochaeta

Tubificidae

9

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 1

ON NO. OF TAXA 1

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 23.5.95

WATER-
COURSE: Kinder

PRIMARY
ANALYST: JB

AQC
ANALYST: SL

SITE: plc R.Sett

CODE: or4k (1549)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Chloroperlidae	Chloroperla torrentium	11
Limnephilidae	Ecclisopteryx guttulata	9
Dytiscidae (incl. Noteridae)	Oreodytes sanmarkii	11
Sphaeriidae	Pisidium sp. 1 only	9
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adults)	11
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 6

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 33

ON NO. OF TAXA 6

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 16.3.95

WATER-
COURSE: Gowy

PRIMARY
ANALYST: KW

AQC
ANALYST:

SITE: Gowy Bridge

CODE: o3d0 (1241)

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Caenidae	Caenis luctuosa/macrura	9
Planariidae (incl. Dugesiidae)	Dugesia polychroa/lugubris, Polycelis nigra/teuuis	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi, Bithynia tentaculata	9
Lymnaeidae	Lymnaea peregra 1 only	9
Physidae	Physa fontinalis 1 only	9
Planorbidae	Gyraulus albus 1 only	9
Leptoceridae	Athripsodes aterrimus 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 7

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 34

ON NO. OF TAXA 7

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 15.3.95

WATER-
COURSE: Rossendale Brook

PRIMARY
ANALYST: KW

AQC
ANALYST:

SITE: ptc R.Bollin

CODE: 1b5c (20)

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydropsychidae	Hydropsyche instabilis 1 only	9
Glossiphoniidae	Glossiphonia complanata 1 only	9
Elmidae	Elmis aenea (larva), Linnius volckmari (adult)	9
Nemouridae	Nemoura cambrica/erratica, Amphinemura sulcicollis	9
Ephemeraidae	Ephemera danica 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 5

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 30

ON NO. OF TAXA 5

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 6.4.95

WATER-
COURSE: Worsley Brook

PRIMARY
ANALYST: MW

AQC
ANALYST: DH

SITE: u/s Liverpool Road, Barnton

CODE: ps0c (2027)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Physidae 8

Additional BMWP taxa found by IFE

Planorbidae Indet Planorbid (damaged specimen) 11

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West	LABORATORY: Southern	DATE: 5.5.95
WATER- COURSE: Micker Brook	PRIMARY ANALYST: PN	AQC ANALYST: DH
SITE: ptc R.Mersey, d/s M63	CODE: q5fo (2201)	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Planorbidae *	1
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Additional BMWP taxa found by IFE

Limnephilidae	Limnephilus lunatus	6
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11
Baetidae	Baetis rhodani 1 only	9
Planorbidae *	Armiger crista 1 only	1
Sphaeriidae	Pisidium sp.	11
Lymnaeidae	Lymnaea truncatula	9
Dytiscidae (incl. Noteridae)	Agabus sp. (larva) 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 6

OMISSIONS: 1

NET EFFECTS:

ON BMWP SCORE 25

ON NO. OF TAXA 6

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 12.5.95

WATER-

PRIMARY

AQC

COURSE: Valley Brook

ANALYST: SJ

ANALYST: DH

SITE: u/s Rof Tributary

CODE: rdq4 (2775)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Planariidae (incl. Dugesiidae)

7

Additional BMWP taxa found by IFE

Dendrocoelidae

Dendrocoelum lacteum

7

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)

Potamopyrgus jenkinsi

9

Sphaeriidae

Pisidium sp. 1 only

9

SUMMARY OF AUDIT

LOSSES 1

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 6

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.5.95

WATER-
COURSE: Tame

PRIMARY
ANALYST: SL

AQC
ANALYST: DH

SITE: d/s Readycon Dean Reservoir

CODE: qzok (2593)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)		12
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Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Anacaena globulus (adults)	11
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Siphonuridae	Siphonurus lacustris	11
Ephemerellidae	Ephemerella ignita	9

SUMMARY OF AUDIT

LOSSES 1

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 20

ON NO. OF TAXA 2

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 4.5.95

WATER-
COURSE: Whittle Brook

PRIMARY
ANALYST: TP

AQC
ANALYST: SL

SITE: ptc Union Bank Brook

CODE: tna8 (3832)

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Dytiscidae (incl. Noteridae)	Agabus sp./Ilybius sp. (larva) 1 only	9
Sphaeriidae	Pisidium sp. 1 only	9
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 11

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 28.4.95

WATER-
COURSE: Millingford Brook

PRIMARY
ANALYST: TP

AQC
ANALYST: SL

SITE: d/s A573, u/s Newton Lake

CODE: tmo0 (3824)

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)

Potamopyrgus jenkinsi

11

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 3

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.10.95

WATER-
COURSE: Randall Carr Brook

PRIMARY
ANALYST: AG

AQC
ANALYST: TP

SITE: Cadster

CODE: ol3w-Au9520

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Dytiscidae (incl. Noteridae)	Hemerobiidae (lacewing)	7
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Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Glossiphoniidae	Helobdella stagnalis 1 only	11
Sphaeriidae	Pisidium sp.	11
Leptophlebiidae	Paraleptophlebia submarginata	11
Planariidae (incl. Dugesiidae)	Polycelis felina 1 only	11

SUMMARY OF AUDIT

LOSSES 1

GAINS 4

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 24.11.95

WATER-
COURSE: Roch

PRIMARY
ANALYST: AG

AQC
ANALYST: TP

SITE: u/s Rochdale ETW

CODE: qi38-Au9533

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West	LABORATORY: Southern	DATE: 9.11.95
WATER-COURSE: Whitewell Brook	PRIMARY ANALYST: CB	AQC ANALYST: TP
SITE: ptc Shawclough Brook	CODE: pcqc-Au9536	SORT/AQC METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Heptageniidae	Ecdyonurus sp. 1 only	11
Asellidae	Asellus aquaticus 1 only	11
Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	11
Hydropsychidae	Hydropsyche pellucidula 1 only	11
Elmidae	Elmis aenea, Limnius volckmari (adults), Oulimnius sp. (larva)	11
Hydrophilidae (incl. Hydraenidae)	Hydraena gracilis (adults)	11
Leptophlebiidae	Paraleptophlebia sp.	9
Psychomyiidae (incl. Ecnomidae)	Tinodes waeneri 1 only	9

SUMMARY OF AUDIT

LOSSES 0 GAINS 8 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 49
ON NO. OF TAXA 8

- | | | |
|--|--|--|
| 1 No representative of family in vial | 5 Specimen dead at time of sampling | 9 Taxon missed in sorting |
| 2 Alternative terrestrial specimen in vial | 6 Taxon in vial but not recorded | 10 Unexplained error |
| 3 Posterior end only in vial | 7 Mis-identification | 11 Taxon added in internal AQC |
| 4 Empty shell or case or cast skin in vial | 8 Typographical error - wrong box ticked | 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 31.10.95

WATER-

PRIMARY

AQC

COURSE: Arrowe Brook

ANALYST: GM

ANALYST: DH

SITE: ptc The Birket

CODE: tbh8-Au9514

SORT/AQC

METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

BMWP taxa not found by IFE

(For samples where vial is broken or absent)

N/a

Additional BMWP taxa found by IFE

Hydrobiidae (incl. Bithyniidae)	Potamopyrgus jenkinsi	9
Coenagriidae	Ischnura elegans 1 only	9
Limnephilidae	Limnephilus sp. 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 16

ON NO. OF TAXA 3

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 1.11.95

WATER-
COURSE: Biddulph Brook

PRIMARY
ANALYST: JB

AQC
ANALYST: TP

SITE: u/s Biddulph ETW

CODE: mlck-Au9512

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Planorbidae

Zonitidae

7

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 1

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -3

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 28.11.95

WATER-
COURSE: Weaver

PRIMARY
ANALYST: JB

AQC
ANALYST: TP

SITE: Wrenbury

CODE: rmzg-Au9523

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Elmidae	Oulimnius sp. (larva) 1 only	11
Leptoceridae	Mystacides azurea 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 2

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 15

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 23.11.95

WATER-
COURSE: Checkley Brook

PRIMARY
ANALYST: KW

AQC
ANALYST: DH

SITE: ptc R.Lea

CODE: s5ck-Au9528

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Sialidae

Sialis fuliginosa 1 only

11

SUMMARY OF AUDIT

LOSSES 0

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 4

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 9.11.95

WATER-
COURSE: Crowton Brook

PRIMARY
ANALYST: KW

AQC
ANALYST: DH

SITE: Crowton Mill

CODE: si68-Au9530

SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

Lymnaeidae	12
Nemouridae	12
Ancylidae (incl. Acroloxidae)	12

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Haliplidae	Halipus sp. (larva) 1 only	9
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SUMMARY OF AUDIT

LOSSES 3

GAINS 1

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE -11

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West
WATER-
COURSE: Luzley Brook

LABORATORY: Southern
PRIMARY
ANALYST: MW

DATE: 27.10.95
AQC
ANALYST: DH
SORT/AQC
METHOD: Preserved/Preserved

SITE: u/s Royton ETW

CODE: oxrg-Au9510

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Oligochaeta	Tubificidae, Lumbriculidae	6
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Sphaeriidae	Pisidium sp., Sphaerium sp.	9
Planariidae (incl. Dugesiidae)	Polycelis nigra/tenuis 1 only	9

SUMMARY OF AUDIT

LOSSES 0

GAINS 3

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 9

ON NO. OF TAXA 3

- 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West
WATER-
COURSE: Fowle Brook
SITE: u/s R. Wheelock

LABORATORY: Southern
PRIMARY
ANALYST: PN
CODE: n2sc (767)

DATE: 30.10.95
AQC
ANALYST:
SORT/AQC
METHOD: Preserved

RESULTS OF MAIN AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

Hydrophilidae (incl. Hydraenidae)	Helophorus grandis, H. aequalis (adults)	6
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SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0 GAINS 1 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 5
ON NO. OF TAXA 1

- | | | |
|--|--|--|
| 1 No representative of family in vial | 5 Specimen dead at time of sampling | 9 Taxon missed in sorting |
| 2 Alternative terrestrial specimen in vial | 6 Taxon in vial but not recorded | 10 Unexplained error |
| 3 Posterior end only in vial | 7 Mis-identification | 11 Taxon added in internal AQC |
| 4 Empty shell or case or cast skin in vial | 8 Typographical error - wrong box ticked | 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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West

LABORATORY: Southern

DATE: 16.11.95

WATER-
COURSE: Valley Brook

PRIMARY
ANALYST: SJ

AQC
ANALYST:

SITE: Foxley

CODE: rcyc (2765)

SORT/AQC
METHOD: Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

None

SUMMARY OF AUDIT

LOSSES 0

GAINS 0

OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 0

ON NO. OF TAXA 0

1 No representative of family in vial

5 Specimen dead at time of sampling

9 Taxon missed in sorting

2 Alternative terrestrial specimen in vial

6 Taxon in vial but not recorded

10 Unexplained error

3 Posterior end only in vial

7 Mis-identification

11 Taxon added in internal AQC

4 Empty shell or case or cast skin in vial

8 Typographical error - wrong box ticked

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)

EXTERNAL AUDIT OF BIOLOGICAL SAMPLES

REGION: North West
WATER-
COURSE: Pedley Brook
SITE: ptc Birkin Brook

LABORATORY: Southern
PRIMARY
ANALYST: SL
CODE: lhuc (29)

DATE: 25.9.95
AQC
ANALYST: TP
SORT/AQC
METHOD: Preserved/Preserved

RESULTS OF PRIMARY AUDIT

Family name	Species name (where appropriate)	Presumed cause of error (see footnotes)
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VIAL

BMWP taxa not found by IFE

None

Additional BMWP taxa found by IFE

None

SAMPLE

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

N/a

Additional BMWP taxa found by IFE

Asellidae	Asellus aquaticus	11
Ephemerellidae	Ephemerella ignita 1 only	11
Leuctridae	Leuctra inermis 1 only	9
Nemouridae	Nemoura avicularis 1 only	11
Piscicolidae	Piscicola geometra 1 only	11

SUMMARY OF AUDIT

LOSSES 0 GAINS 5 OMISSIONS: 0

NET EFFECTS:

ON BMWP SCORE 34

ON NO. OF TAXA 5

- 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)