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Tiered approach to the assessment of metal compliance in surface waters. Extension report: nickel

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Executive summary

The aquatic environment is sensitive to damage from a wide range of chemicals. Environmental quality standards (EQSs) are one of the instruments used by the Environment Agency to protect and improve water quality. Derived from toxicological data, the EQS values set limits for chemicals and elements in water bodies.

The Environment Agency is considering options for implementing proposed metal EQSs under the Water Framework Directive (2000/60/EC). The use of a tiered assessment system for metals has been shown to offer a viable option for considering metal compliance. The three levels of this tiered approach progressively take account of the background concentrations of metals and their bioavailability:

Tier 1: compares observed concentrations with the provisional EQS for the metal. This takes little account of either background concentrations or bioavailability.

Tier 2: compares observed concentrations with the EQS plus an accepted aquatic background concentration of the metal to reflect regional or local situations.

Tier 3: compares observed concentrations with a 'bioavailable' predicted no-effect concentrations (PNEC) derived from biotic ligand models (BLMs).

This report considers compliance against nickel EQSs using this approach, and provides an assessment of data generated for the first two tiers. A full assessment including Tier 3 may be completed when the Ni-BLM is finalised. Two Environment Agency datasets were used in the assessment:

- a complete sample set including biological monitoring data 1995;
- a concentration database extending from 1993 to 2004 used to determine concentration trends and compliance with the EQS.

In general, a much higher degree of compliance is observed for nickel compared with copper and zinc (covered in a previous assessment). Only around 1 per cent of the available data exceeded the proposed EQS and was mostly associated with highly urbanised discharges or minewater inputs.

There was no correlation between nickel levels and the ecological quality of the rivers, probably due to two factors: a lack of sensitivity to metals by the available metric for determining ecological quality (invertebrate presence and numbers) and/or acclimatisation of indigenous species to local elevated nickel concentrations.

Differences in levels of compliance between the first two tiers were limited because of the relatively small background addition (3.6 µg/l) made to the EQS (20 µg/l). The choice of background concentrations is critical to the overall assessment of compliance and is the subject of previous Environment Agency research. For the purpose of this assessment, median values given in a draft report from a project done in collaboration with the British Geological Survey were used. However, reported data are limited and biased towards the east of England and the Midlands. Therefore, the selected background concentrations may lead to an underestimate of concentrations based on local mineralogy.

Overall, the level of compliance for nickel has improved significantly over the past decade owing to tighter regulation and a general decline in the manufacturing industry in England and Wales. However, the proposed nickel EQS of 20 µg/l is a provisional value and is dependent on the outcome of the EU risk assessment for nickel currently being completed. Should the EQS be reduced to less than 5 µg/l, as originally proposed, the number of exceedances may be expected to increase significantly.

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The authors wish to thank those Environment Agency staff who supplied the data required for this project. Particular thanks go to Caroline Potter who was responsible for providing information from the Environment Agency's WIMS database and Dr David Trigg of Staffordshire University for supplying nickel and organic carbon data.

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1 Introduction

The aquatic environment is sensitive to damage from a wide range of chemicals. The Environment Agency, therefore, uses a variety of standards and targets to protect and improve the quality of water resources in England and Wales. In particular, Environmental quality standards (EQSs) derived from toxicological data are used to assess and limit the levels of chemicals in the aquatic environment so that water bodies are protected from deterioration. For example, EQSs are used to calculate discharge consents for effluents discharged to surface waters. They also help the Environment Agency to check national progress in protecting water quality and to identify where urgent action may be necessary. Indeed, EQSs may drive considerable investment in water quality programmes and the development of new techniques and technologies to achieve quality targets.

Environmental quality standards are vital in:

- protecting the environment;
- controlling risks to domestic, industrial, and agricultural water supplies;
- ensuring people can enjoy water-based leisure activities in safety.

This report describes a preliminary assessment of a tiered approach to nickel compliance with EQSs in surface waters.

1.1 Derivation of quality standards

Given their unequivocal importance, the calculation, interpretation, and implementation of EQSs require careful consideration. For example, how is the toxicologically derived limit value that forms the basis of the EQS calculated? What is the technical feasibility of assessing compliance to an EQS and are there any cost implications?

Environmental quality standards are derived by assessing toxicity data for a range of organisms from a number of trophic levels within the aquatic system (typically fish, algae, and invertebrates). The most reliable and sensitive (i.e. lowest) value for a reported no observed effect concentration (NOEC) is then identified. Ideally, the NOECs are from chronic tests that include sub-lethal endpoints.

An assessment factor (AF) is then applied to the NOEC to create a predicted no-effect concentration (PNEC). The AF accounts for uncertainty in the data; results for reported species may not include the most-sensitive species present in the actual environment. The AF varies depending on the amount of data available, but is usually between a factor of 10 and 1,000 as recommended by the EU Technical Guidance Document (TGD) (EC 2002). A PNEC may also be derived using the TGD's probabilistic approach (species sensitivity distribution (SSD) approach) providing the minimum quantity of reliable, long-term toxicity data are available. Depending on the available information, an AF of 1 to 5 is applied to the 5th percentile of the SSD to derive the PNEC.

For synthetic organic compounds, the PNEC can be used as an EQS value designed to protect the vast majority of organisms present in surface waters. For risk assessment purposes (EC 2002), the PNEC is compared with the predicted environmental concentration (PEC). If the PEC/PNEC ratio, often described as the risk characterisation ratio (RCR), exceeds one, then an adverse impact may be occurring in the environment.

1.2 Consideration of background concentrations

Many metals, e.g. nickel, copper, and zinc, occur naturally in the environment. Even without the existence of humans and their industrial activity, significant concentrations of metals would occur in water because of the underlying natural geology. Yet nickel is also essential to life: it participates in key enzymatic and metabolic processes. Thus, aquatic organisms possess mechanisms to regulate nickel accumulation, absorbing the required quantity for metabolic functions and excreting the excess. In many cases where high concentrations of nickel occur naturally, indigenous species have adapted to tolerate elevated background levels.

For nickel and other metals, the simple translation of a PNEC based on laboratory-derived toxicity data into an EQS value could (and often does) lead to a gross overestimate of their potential toxicity in the aquatic environment. Laboratory toxicity experiments are generally carried out in waters with very low background concentrations of nickel, into which additions are made to determine the toxicity thresholds. Nickel concentrations in the test and culture water are normally minimised to ease data interpretation whereas elevated concentrations may occur naturally, especially in metalliferous regions.

Nickel speciation and ambient background concentrations ought to be taken into account when deriving the EQS. Existing legislation allows for these factors to some extent. Under the EU Dangerous Substances Directive, nickel PNECs have been classified into 'hardness bands' to translate laboratory-derived PNECs into working EQS values which may be used to assess regulatory compliance.

To accommodate natural variations in metal concentrations, the 'added risk' approach has been developed and used within the EU TGD methodology (EC 2002). This approach takes the laboratory-derived PNEC and allows the addition of a background concentration to derive an EQS. Therefore, the PNEC, described as the $PNEC_{add}$, is the value at which toxic effects occur ignoring contributions from background concentrations and applies only to the 'added' contribution over and above the background level. Although the added risk approach appears to be highly pragmatic, it leads to lengthy debates about what is an appropriate background value.

To keep calculations and comparisons simple and consistent, the use of a single background concentration value is preferred. The most conservative choice for a background concentration would be the observed concentrations in 'pristine' environments not influenced by human activity. However, in countries such as the UK, the presence of mineral-rich geology means that elevated metal concentrations are reported even in pristine areas. This wide natural variation in metal concentrations makes it difficult to agree on a single background concentration value – even before the debate over whether a mean, median, or percentile concentration is used

Furthermore, few UK rivers, even in upland areas, are unaffected by human activity. Metals enter the water from agriculture, atmospheric deposition, road run-off, industrial discharges, and effluents from sewage treatment works. It would, therefore, seem appropriate to apply local background concentrations to $PNEC_{add}$ values to derive local EQS values for metals. In many cases, however, there are insufficient data on local nickel concentrations to derive these site-specific values, and a workable methodology has yet to be agreed at either a Member State or EU level. In addition, the link between nickel and other metal concentrations and ecological quality has yet to be fully elucidated. It is not yet possible to conclude accurately just how elevated concentrations can become before biodiversity and ecological quality are adversely affected.

Ongoing monitoring studies on the background concentrations of metals in UK waters (Environment Agency 2006) will provide more data to feed into this debate.

1.3 Nickel bioavailability

The influence of nickel speciation on bioavailability and subsequent metal toxicity is considerable and is controlled by ambient water quality, including:

- pH;
- calcium concentration;
- alkalinity;
- presence of dissolved organic ligands as estimated by dissolved organic carbon (DOC) measurements.

As a consequence, the monitoring of total nickel concentrations in water is a blunt and inaccurate metric by which to regulate discharges and implement environmental protection. Even dissolved measurements can lead to a significant overestimate of toxicity owing to interactions of the toxic free metal ion with other dissolved phase substances (e.g. major ions and organic metal-complexing agents).

Recent developments in the understanding of the mechanisms that affect metal bioavailability and toxicity in water has led to the development of biotic ligand models (BLMs) for copper and zinc (e.g. Heijerick et al. 2002, De Schamphelaere et al. 2005). A BLM is currently being developed for nickel. These models allow the prediction of the ecotoxicologically relevant metal concentration on a site-specific basis based on a combination of the physico-chemical properties of the water column and known ecotoxicological data.

The use of a tiered approach for the assessment of copper and zinc compliance in surface waters was investigated in a previous report (Environment Agency 2007). This extension project assesses the current situation for nickel. This report has been produced in advance of the release of the Ni-BLM and assesses the potential compliance of English and Welsh water bodies with the proposed EQS under the Water Framework Directive (WFD) 2000/60/EC using the first two tiers of the approach (see Section 1.4). Once the Ni-BLM has been made available, its outputs may be incorporated at a later date.

1.4 Options for a tiered approach to the assessment of regulatory compliance

At present, the key issues of metal background concentrations and bioavailability are not being widely considered in the standard-setting regimes in Europe. For example, recent projections using surface water data from England and Wales (*n* >1,000) show water quality failures, i.e. concentrations above the potential PNEC, could be greater than 50 per cent in the case of zinc. However, there is little evidence to suggest that surface waters in England and Wales are significantly degraded in terms of ecological impacts by metal pollution. On the contrary, the tightening of consents for discharges to the aquatic environment together with the decline of the UK's manufacturing industry has reduced zinc inputs to surface waters over time.

This situation suggests that the standard-setting procedure (including the issue of implementation) has not been followed correctly and/or the standards do not adequately take account of metal background concentrations or speciation, i.e. actual risks are lower. This project focuses on these areas of uncertainty for nickel.

The Environment Agency is considering options for implementing metal EQSs under the WFD. It is looking to provide a practical methodology by which reported environmental concentrations may be assessed using an approach that progressively becomes more site-specific. The proposed tiered approach filters data through three tiers of assessment in order to methodically evaluate compliance with the EQS:

Tier 1: observed concentrations are compared with the PNEC/EQS without any corrections.

Tier 2: observed concentrations are compared with the PNEC/EQS plus an accepted background concentration of the metal.

Tier 3: observed concentrations are compared with a site-specific standard that accounts for the local bioavailability of the metal, based on in situ water chemistry.

Figure 1.1 provides a schematic representation of the proposed methodology. This report provides data and an assessment of the first two of the possible three tiers of the approach. Tier 3 is not considered in this report, but may be on release of the Ni-BLM.

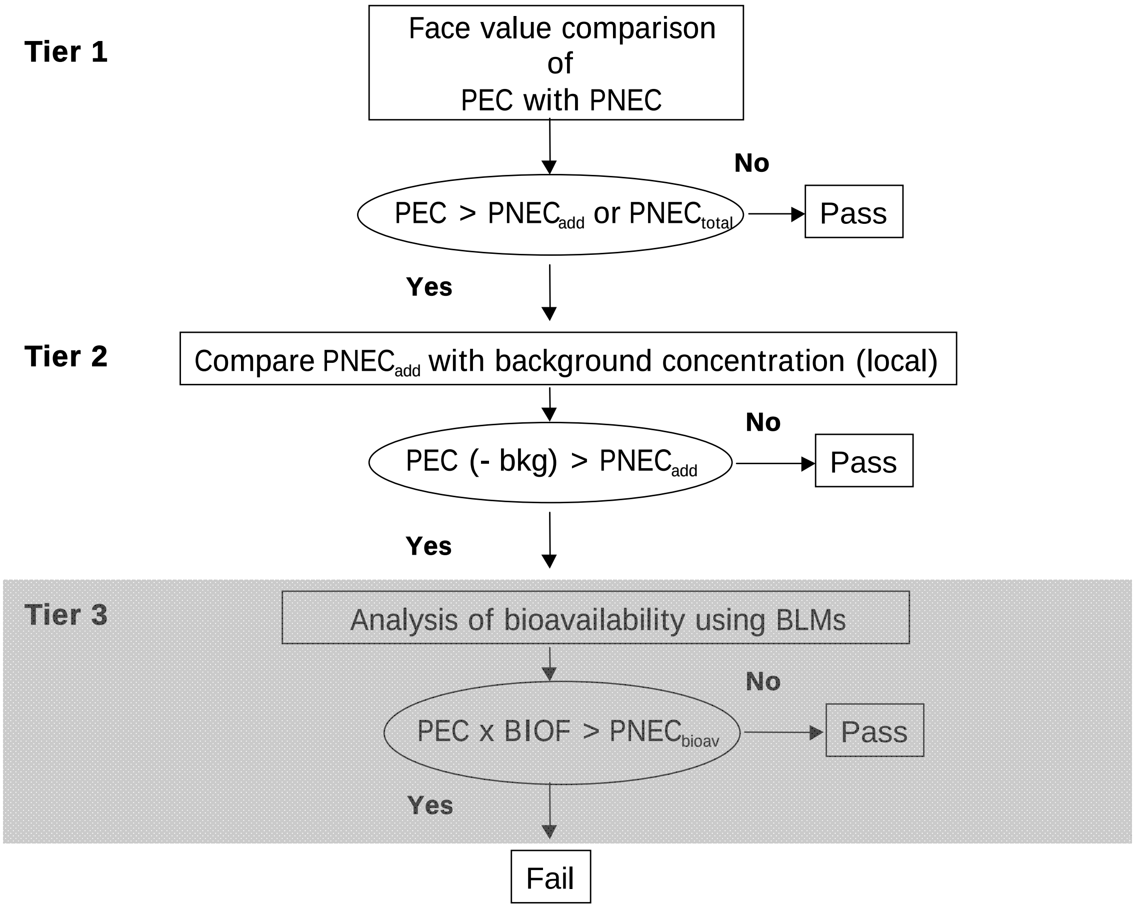

Figure 1.1 Proposed tiered assessment

1.5 Nickel-specific issues

Nickel is an essential element used in small quantities within enzyme processes. There are widely varying concentrations of nickel in UK waters owing to natural geology and anthropogenic inputs from diffuse and point sources. Historically, industrial discharges and mining contributed significantly to surface water concentrations of this element. Within the last five decades, the reduction in the UK's manufacturing industry and closure of the majority of the mines mean that the UK is left with only the legacy of these polluting discharges (e.g. mine drainage water, run-off from contaminated land) concentrated in localised areas. However, there are numerous lower level point and diffuse sources of nickel to the aquatic environment as it is used in a wide range of common products, including metal-plated consumer products, batteries, alloys, and coins.

Nickel is currently regulated as a List 2 chemical under the Dangerous Substances Directive. The EQSs for nickel are set according to the hardness of the water body and range from 50 (in waters of hardness of <50 mg/l $CaCO_3$) to 200 µg/l (in waters of hardness of >250 mg/l $CaCO_3$) for salmonid and cyprinid fish. The EQSs recognise the enhanced bioavailability and hence toxicity of nickel in softer waters.

The progression through the tiers proposed in Figure 1.1 represents an increasingly site-specific assessment of water quality, particularly if local background concentrations are applied, leading to site-specific bioavailability calculations.

This project is a practical attempt to test the tiered approach using the proposed EQS for nickel (Tier 1) combined with potential background concentrations (Tier 2) (see Figure 1.1).

1.5.1 Outputs from the nickel risk assessment report

The proposed WFD EQS for nickel is provisionally set at 20 µg/l (EC 2006) pending the outcome of the risk assessment report (RAR) that is being finalised (EU RAR 2007).

The draft RAR reviews all available literature on the toxicity of nickel to aquatic organisms and all the accepted data are normalised using the appropriate species-specific BLMs. The NOEC (or EC10) values of the most-sensitive endpoints are then used to construct a species sensitivity distribution. The 5th percentile (HC5) at the 50 per cent confidence level is generally accepted as a value to use as a basis for the PNEC derivation.

The draft RAR proposes a regional approach to setting a PNEC covering a number of ‘eco-regions’ of defined hardness, pH, and DOC levels (Table 1.1).

Table 1.1 Summary of HC5s at the 50% confidence level using a log-normal fit for the eco-regions in the draft nickel RAR

Scenario	Type	Physico-chemical characteristics[1]	HC5 at 50% confidence level (µg/l) using log-normal distribution
Ditch in the Netherlands	Small (ditches with flow rate of ±1,000 m^3/day)	pH 6.9 hardness 260 DOC 12.0	43.6 (23.7–68.6)
River Otter, UK	Medium (rivers with flow rate of ±200,000 m^3/day)	pH 8.1 hardness 165 DOC 3.2	8.1 (4.1–13.4)
River Teme, UK	Medium (rivers with flow rate of ±200,000 m^3/day)	pH 7.6 hardness 159 DOC 8.0	19.0 (10.7–29.2)
River Rhine, NL	Large (rivers with flow rate of ±1,000,000 m^3/day)	pH 7.8 hardness 217 DOC 2.8	10.8 (5.6–17.7)
River Ebro, Spain	Mediterranean river	pH 8.2 hardness 273 DOC 3.7	8.7 (4.4–14.5)
Lake Monate, Italy	Oligotrophic systems	pH 7.7 hardness 48.3 DOC 2.5	7.1 (4.0–11.0)
Acidic lake in Sweden	Neutral acidic system	pH 6.7 hardness 27.8 DOC 3.8	12.1 (6.9–18.4)

Notes: [1] Hardness in mg/l $CaCO_3$ and DOC in mg/l.

The conclusion from the draft RAR is:

> 'Based on weight of evidence and related to also the overall assessment of the size of the extra assessment factor for other data-rich metals, it is proposed to use an AF of 2. This factor is proposed being used when estimating the site/water course/region specific PNECs based on the HC5-derivation employing the log-normal fit function for SSD curve fitting and based on the full normalisation approach as described in this report'.

The HC5s that would be used as a basis for PNECs for those scenarios shown in Table 1.1 are generally less than the proposed WFD EQS value of 20 µg/l without applying an extra AF of 2. However, to generate PNECs for other defined regions, data would first need to be normalised for bioavailability to each type of water body. At this point, therefore, it is not possible to estimate with any certainty the exact PNEC value that would be applied to each water body without fully evaluating the site- or regional-specific physico-chemical properties in combination with 'normalisation' for bioavailability.

Further guidance on these values is expected to be produced once the RAR is finalised.

1.6 Project objectives

The primary objective was to develop an approach for the regulation of metals including nickel by assessing compliance in ways that take into account background concentrations and speciation/bioavailability. Furthermore, the project assessed the extent of water bodies failing to meet the proposed nickel standards when backgrounds and speciation are not considered.

Specifically, the project was designed to provide a practical trial of a tiered approach to the assessment of compliance. It therefore:

- compared the EQS against measured concentrations as well as taking account of background concentrations;
- assessed the value of the tiered approach by comparing historical EQS failure data and paired biological data to determine prevalence of Type I errors (false positives);
- assessed the likely number of sites in England and Wales for which the tiered approach would be needed for nickel;
- provided a critique of the potential use of the tiered approach, formulating recommendations and targeting areas for further work.

This report provides data and an assessment of the first two of the possible three tiers of the assessment.

It is noteworthy that the proposed nickel EQS of 20 µg/l under the WFD is a provisional value and subject to outcomes from the nickel RAR, which has yet to be completed (see Section 1.5.1).

2 Methodology

2.1 Datasets

This assessment follows on from that of copper and zinc, metals for which reliable BLMs were already available in combination with readily available aquatic monitoring data (Environment Agency 2007). A similar approach was applied to nickel.

Two types of data were selected for use in this project:

- Environment Agency monitoring data:
  - Water Information Management System (WIMS) physico-chemical data
  - biological General Quality Assessment (GQA) data;
- background concentrations derived as a part of another project (Environment Agency 2006).

Two specific Environment Agency datasets were used in this assessment:

- a full 1995 dataset of chemical and biological parameters;
- an Environment Agency chemical parameter dataset for 1993–2004 used to determine levels across the country and to assess trends in compliance (supplied by Staffordshire University).

The full 1995 dataset including matched chemical and biological monitoring data was used to assess compliance at the Tier 1 and Tier 2 levels.

A larger WIMS dataset supplied by Staffordshire University was used to determine levels of compliance at the first two tiers of the assessment covering the period 1993 to 2004, thus allowing an appraisal of trends over a 10-year period.

Annex A provides a summary table for the selected sites based on available 1995 chemical and biological monitoring data. Annex B provides a summary of the concentration trend data based on the 1993–2004 dataset.

2.2 Tiered assessment

2.2.1 Tier 1

The Tier 1 assessment compares reported data for dissolved nickel with the EQS without considering potential background concentrations and bioavailability.

The proposed WFD EQS of 20 µg/l was generated at an EU level (EC 2006), but is subject to change pending the outcomes of the RAR for nickel (EU RAR 2007). This provisional EQS is lower than the current hardness-based EQSs set under the Dangerous Substances Directive (Table 2.1).

Table 2.1 Current EQSs for dissolved nickel derived under the Dangerous Substances Directive

Hardness	Current EQS[1] (µg/l)
0–50 mg/l $CaCO_3$	50
50–100 mg/l $CaCO_3$	100
100–200 mg/l $CaCO_3$	150
>200 mg/l $CaCO_3$	200

Notes: [1] Applies to both salmonid and cyprinid waters.

2.2.2 Tier 2

Where observed dissolved concentrations of nickel exceed the EQS, the next tier of assessment takes account of background concentrations of the metal. This is the level of nickel to which indigenous organisms would be expected to have 'acclimatised'; indeed this concentration would be responsible, in part, for the diversity of the organisms found there.

The value of metal background concentrations has been the subject of intense debate, not least because it can have a profound impact on any assessment of metal compliance. The Environment Agency has commissioned a project with the British Geological Survey to determine English and Welsh background concentrations for selected metals, including nickel. The current data are not comprehensive, but cover a large proportion of the east of England, the Midlands, and a few localised areas of the south west of England and Wales. Currently, only interim conclusions are available and so for illustrative purposes, and to be consistent with the approach used for copper and zinc, the median value for nickel of 3.6 µg/l has been used in this report for the background concentration (Table 2.2; Environment Agency 2006).

Table 2.2 Proposed values used at Tier 2 of the assessment

	Concentration (µg/l)
Provisional WFD EQS	20
Background concentration[1]	3.6 (4.9)
Tier 2 assessment value	23.6

Notes: [1] A median value is used to derive the Tier 2 assessment value. The figure in brackets is the average background concentration (Environment Agency 2006).

Surface water nickel concentrations are available via the Geological Survey of Finland (http://www.gtk.fi/publ/foregsatlas/) and have been used as part of the nickel RAR (EU RAR 2007) (Table 2.3 and Figure 2.1).

Table 2.3 Summary of European concentrations for nickel in water[1,2]

Parameter	Nickel concentration (µg/l)
Minimum	0.03
Median	1.91
Mean	2.43
Standard deviation	2.49
90th percentile	4.72
Maximum	24.60

Notes: [1] From http://www.gtk.fi/publ/foregsatlas/.
[2] Number of samples = 807.

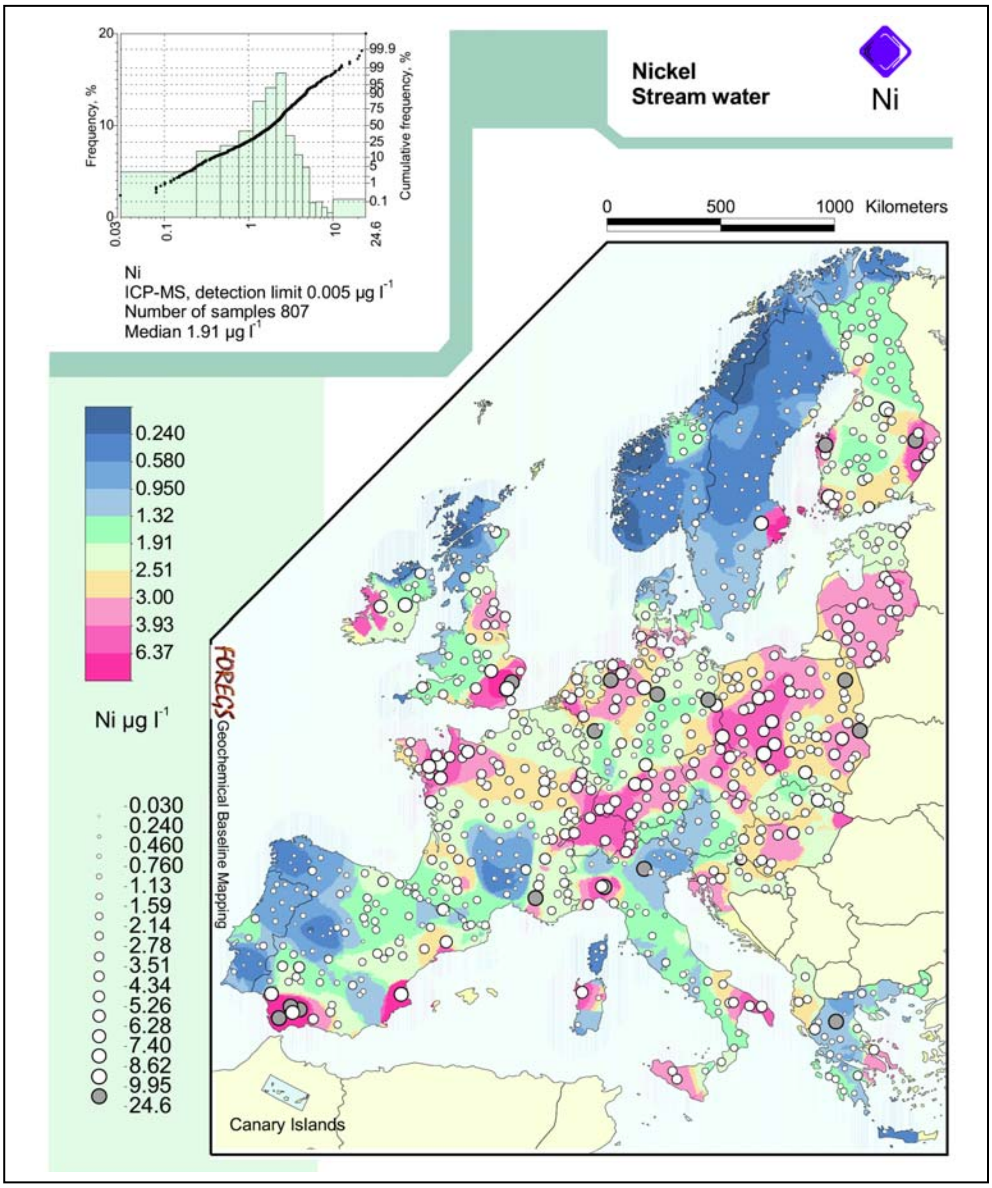

Figure 2.1 Total nickel concentrations in EU surface waters (source: http://www.gtk.fi/publ/foregsatlas/)

A comparison of the UK data with European figures suggests that, in general, UK concentrations are marginally higher than those on the continent, although not markedly so. The coverage of the Environment Agency background data is actually biased towards areas of the UK where nickel concentrations are elevated (e.g. the east of England), which may explain the slightly higher mean and median values. Across the UK as a whole, average surface water concentrations for nickel are probably in line with those reported for Europe. However, the approximate factor of 30 difference in nickel concentrations across the UK does suggest that the use of a single background concentration may not be appropriate for a Tier 2 assessment.

2.2.3 Tier 3

When observed dissolved nickel concentrations exceed the Tier 2 (EQS plus background) concentration, the final tier of assessment takes account of the bioavailable fraction of the metal present in the sample, based on its water chemistry.

This tier may be assessed at a later date once the Ni-BLM is available.

2.3 Comparison of tiered assessment data with biological monitoring data

The Environment Agency uses biological indices to determine the ecological status of a watercourse. Two commonly used systems are the Biological Monitoring Working Party (BMWP) system and the related average score per taxon (ASPT).

The BMWP system, developed in the 1970s, provides scores for around 80 different groups of invertebrates based on their perceived tolerance to organic pollution. The higher the BMWP score assigned, the less pollution tolerant is the group. A weakness with the BMWP system is its dependence on the sampling effort: the more vigorous the sampling, the greater the potential for collecting a larger range of organisms.

The ASPT is used to overcome this limitation and is calculated by dividing the BMWP score by the number of groups present. As different types of watercourse can support different ranges of animals, the River Invertebrate Prediction and Classification System (RIVPACS) was developed to predict the taxon richness and expected ASPT at different types of sites if those sites were unpolluted. The expected values for a particular site are its ‘reference state’. The ratio of the observed/expected values can be used to judge the true biological condition of the site.

The ASPT ratios (also referred to as an ecological quality index, EQI) are used in the biological GQA by the Environment Agency to grade watercourses from very good to bad. Table 2.4 provides the grades according to the EQI for ASPT.

Table 2.4 Biological grades under the GQA system

Grade	EQI for ASPT	Environmental quality
A	1.00	Very good
B	0.90	Good
C	0.77	Fairly good
D	0.65	Fair
E	0.50	Poor
F	<0.50	Bad

The GQA methodology was developed to assess impacts from pollution derived from organic load, ammonia, and low dissolved oxygen. Although it was not developed to measure potential metal pollution, the methodology has produced the only cohesive dataset to attempt to match observed ecological quality in a river system with measured metal concentrations and predictions of bioavailability.

This project, therefore, analysed the matched biological and chemical data in detail to investigate whether the tiered approach to metal compliance in surface waters could predict good ecological quality in the water column.

2.4 Implications of a change in the EQS on compliance

The WFD EQS for nickel is provisional and may be revised, if necessary, depending on the outcomes of the nickel RAR (EU RAR 2007). To indicate the possible impacts of altering the value of the EQS on the rate of compliance for rivers, an assessment was performed to estimate compliance versus possible EQSs. Data from the WIMS database selected for all English and Welsh water body samples between 2000 and 2004 (ca. 4,600 data points) were used to plot the percentage exceedances for any given EQS down to the limit of detection of 5 µg/l.

A similar approach to assessing levels of compliance could be applied to the outputs from the RAR provided the eco-regions are defined and the correct normalisation is applied to the reported NOECs. This information is not currently available, but comparison with defined region-specific EQSs could be incorporated at a later date.

3 Results and discussion

3.1 Tiered assessment

Two datasets were used to evaluate a tiered approach to the assessment of metal compliance in surface waters:

- A ‘complete’ set of data from the Environment Agency’s WIMS database for 1995 that included chemical and biological monitoring data with which to assess compliance. The absence of DOC values for this dataset meant that these data could be assessed only at the Tier 1 and Tier 2 levels (as described in this report).
- Another WIMS dataset held by Staffordshire University that contained chemical and biological monitoring data for the period 1993 to 2004. Data within this database were used to assess trends over the past decade for compliance at Tier 1 and Tier 2. This database could be used as the source of data for Tier 3 once the Ni-BLM is available and input parameters have been identified.

3.1.1 Tiers 1 and 2 assessment using the Environment Agency’s 1995 dataset

The Environment Agency’s 1995 dataset covers 7,230 samples, of which 620 values were reported for dissolved nickel. These values ranged from less than the limit of detection (varying between 1 and 5 µg/l) to 150 µg/l.

Table 3.1 summarises the number of ‘failures’ at Tiers 1 and 2 for nickel. A comparison of the data with the current hardness-based EQSs showed that there would only be a maximum of two failures (owing to a lack of hardness data for these two samples, it was assumed they could fall into the soft water category and, therefore, exceed the EQS).

Based on the provisional WFD EQS, 15 samples out of 620 were >20 µg/l (2.4 per cent). On face value, there would seem to be only a small number of localised EQS exceedances associated with historic mining activity in the south west of England or highly urbanised streams, as found in London. Adding on the median UK background concentration (BG_{med}) for nickel removes three of the ‘failures’, reducing the number of exceedances to 12 out of 620 (1.9 per cent).

Table 3.1 Summary of the number of samples ‘failing’ at each tier of assessment for the 1995 dataset[1]

Description	Value	Number of data points[2]
‘Failure’ of existing EQS	>EQS (50–200 µg/l)	<2
‘Failure’ at Tier 1	>EQS (20 µg/l)	15 (2.4%)
‘Failure’ at Tier 2	>EQS + BG_{med} (23.6 µg/l)	12 (1.9%)

Notes: [1] The 1995 dataset comprised a total of 7,230 data points, of which 620 reported dissolved nickel concentrations.
[2] Values in brackets are percentage ‘failures’.

3.1.2 Tiers 1 and 2 assessment using wider Environment Agency datasets from 1993 to 2004

The datasets for nickel covering 1993 to 2004 were selected to enable further testing of the first two tiers of the assessment. Additional data for individual river sites are provided in Annex B. Detailed monitoring data for dissolved nickel from the WIMS database was provided by the Environment Agency via Staffordshire University for English and Welsh rivers from 1993 to 2004.

The data reveal a distinctly improving situation regarding concentrations of nickel in rivers over the identified period (Figure 3.1).

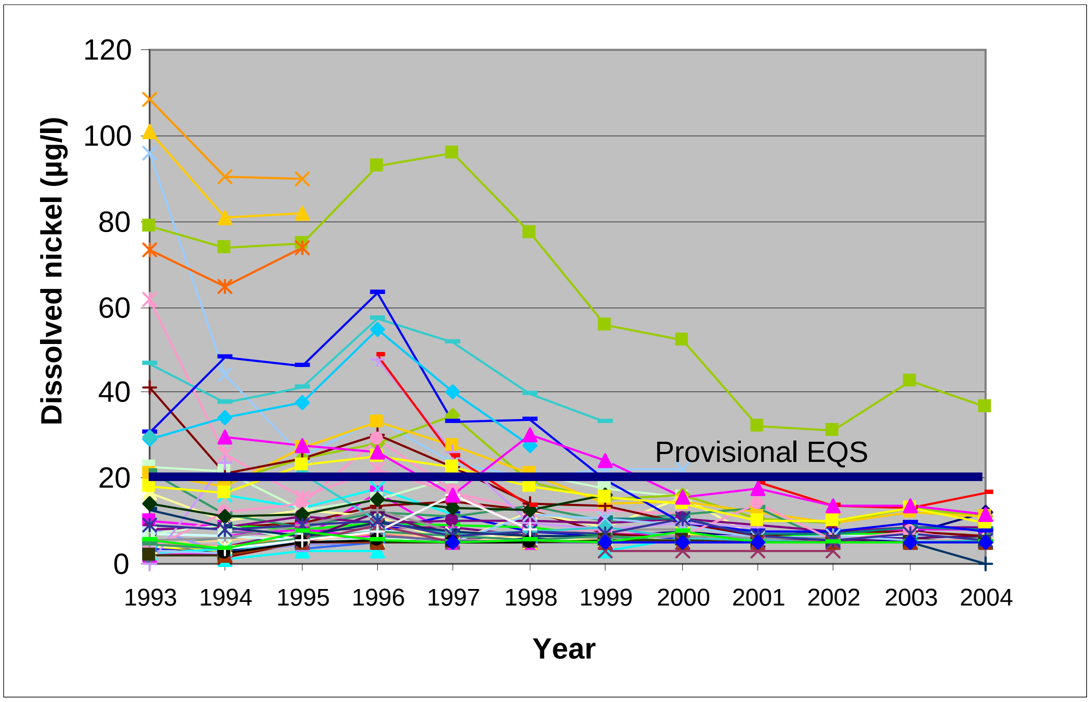

Figure 3.1 Dissolved nickel concentrations at Environment Agency sampling sites for 1993–2004

A summary of the data shows that, by 2001, less than 5 per cent of the sampled sites exceed 20 µg/l dissolved nickel as an annual average. Even when taking maximum concentrations, less than 10 per cent of all rivers reported exceedances of 20 µg/l at any given time (Table 3.2 and Figure 3.2). Differences between the Tier 1 and Tier 2 assessments are not particularly large owing to the relatively small background addition.

Table 3.2 Summary of the level of compliance for nickel in rivers with time

Year	Number of rivers	Exceedances in rivers based on maximum nickel concentrations				Exceedances in rivers based on mean nickel concentrations			
		Tier 1		Tier 2		Tier 1		Tier 2	
		Number	%	Number	%	Number	%	Number	%
1993	82	22	27	21	26	14	17	12	15
1994	113	26	23	23	20	14	12	13	12
1995	129	24	19	23	18	15	12	13	10
1996	77	20	26	19	25	13	17	13	17
1997	64	16	25	13	20	9	14	8	13
1998	55	11	20	11	20	6	11	5	9
1999	61	10	16	9	15	5	8	4	7
2000	55	12	22	10	18	2	4	1	2
2001	48	4	8	4	8	1	2	1	2
2002	48	2	4	2	4	2	4	2	4
2003	80	5	6	2	3	2	3	2	3
2004	79	3	4	3	4	1	1	1	1

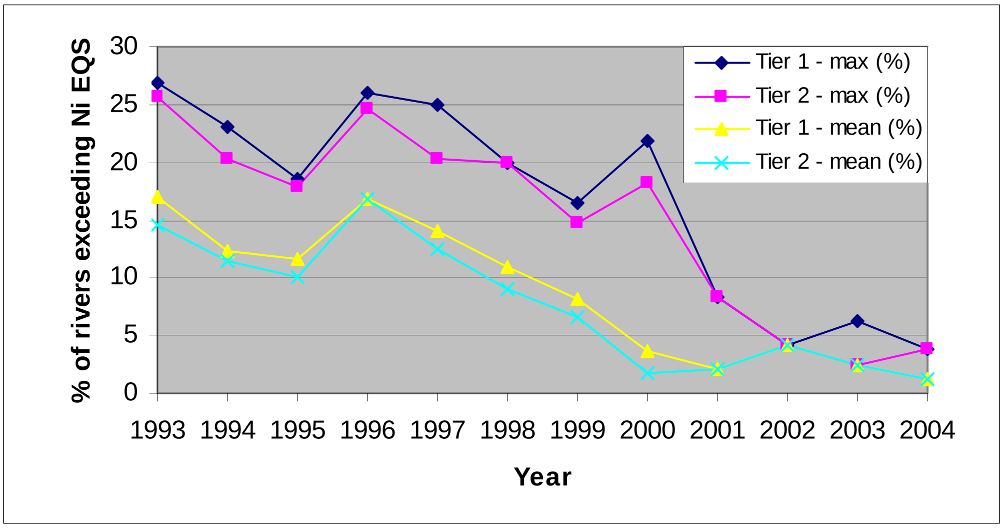

Figure 3.2 Percentage of exceedances for nickel in rivers with time

The data reflect the fact that nickel discharges to urban rivers have declined significantly with time, potentially from a combination of:

- tighter control of trade discharges;
- phosphorus dosing of tap waters;
- improved wastewater treatment;
- a declining manufacturing industry.

To a lesser degree, the data also reflect the fact that fewer samples were taken in recent years, with some more-contaminated locations not appearing on the database.

3.2 Comparison of the tiered approach with biological monitoring data

There needs to be confidence that any ‘relaxation’ of quality standards using a tiered approach to the assessment of compliance will not lead to a degradation of ecological quality. Data derived from BLMs reflect observations made mostly in the laboratory under carefully controlled conditions. Behaviour of organisms in the environment can differ significantly. Consequently, a key objective of this project was the comparison of the tiered approach with available biological monitoring data.

In the UK, the ecological ‘health’ of a river is determined with periodic benthic sampling surveys. These surveys determine the presence and abundance of organisms (predominantly invertebrates) associated with different water quality in order to classify river reaches based on BMWP scores, number of taxa, and ASPT ratios (see Section 2.3).

These parameters tend to be more responsive to pollution from ammonia, elevated biochemical oxygen demand (BOD), and oxygen depletion, rather than metal pollution. A direct comparison between these biological indicators and metal levels cannot necessarily be drawn. However, elevated metal concentrations would probably have had some degree of impact on these types of biological communities. Metals partition into the solid phase, so high concentrations of metals measured in the water column during routine sampling would imply higher concentrations accumulating in nearby sediments. High levels of metals in sediments would affect the benthic invertebrates measured as part of a biological sampling process. In short, although GQA data may not provide a direct measure of potential metal toxicity, some inferences may be made.

3.2.1 Comparison of biological monitoring data with the Environment Agency’s 1995 dataset

The ASPT ratios were calculated for all the 1995 biological data supplied by the Environment Agency and compared with the dissolved nickel concentrations in order to understand how nickel levels may have influenced the ecological quality of the sample sites.

Much of the reported dissolved nickel data are at, or near, the limit of detection (typically 5 µg/l). Of the reported concentrations exceeding the WFD EQS, there is no correlation between nickel concentrations and biological quality.

Given that the BMWP score, and hence the ASPT ratio, is based on perceived tolerance to organic pollution, confounding factors such as high ammonia, high BOD, and high concentrations of other heavy metals need to be removed to assess whether or not there is any relationship between environmental quality and nickel concentration. The results of removing these factors are presented in Figure 3.3.

Little difference is observed in the data trends after removing samples with high BOD and total ammonia concentrations (Table 3.3 and Figure 3.3). However, the removal of samples where other metals exceed their respective EQSs (set under the Dangerous Substances Directive) reduces the number of nickel exceedances to only six when compared with the provisional EQS and three after adding the background concentration to the EQS at Tier 2. Of the remaining exceedances, there is still no correlation between nickel concentrations and biological quality. In fact, all the six samples where nickel exceeds 20 µg/l have ASPT scores that suggest at least ‘fair’ ecological quality. However, there may be other factors influencing the ecological quality at a site, particularly as a full dataset of metal concentrations was not available for each site.

Table 3.3 Data points with confounding factors removed for the 1995 dataset

	All dissolved nickel		Removing ammonia >1.3 mg/l		Removing ammonia >1.3 mg/l; BOD >6 mg/l		Removing ammonia >1.3 mg/l; BOD >6 mg/l; metals >EQS	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Data points	620		598		597		471	
Data points >EQS (20 µg/l)	15	2.4	15	2.5	15	2.5	6	1.3
Data points >EQS+BG_{med} (23.6 µg/l)	12	1.9	12	2.0	12	2.0	3	0.6
GQA – poor/bad quality (EQI <0.65)	40	6.5	39	6.5	39	6.5	29	6.2
GQA – fair or better (EQI >0.65)	580	93.5	559	93.5	558	93.5	442	93.8
Data points removed			22	3.7	1	0.2	126	27
Cumulative data points removed			22	3.7	23	3.7	149	24

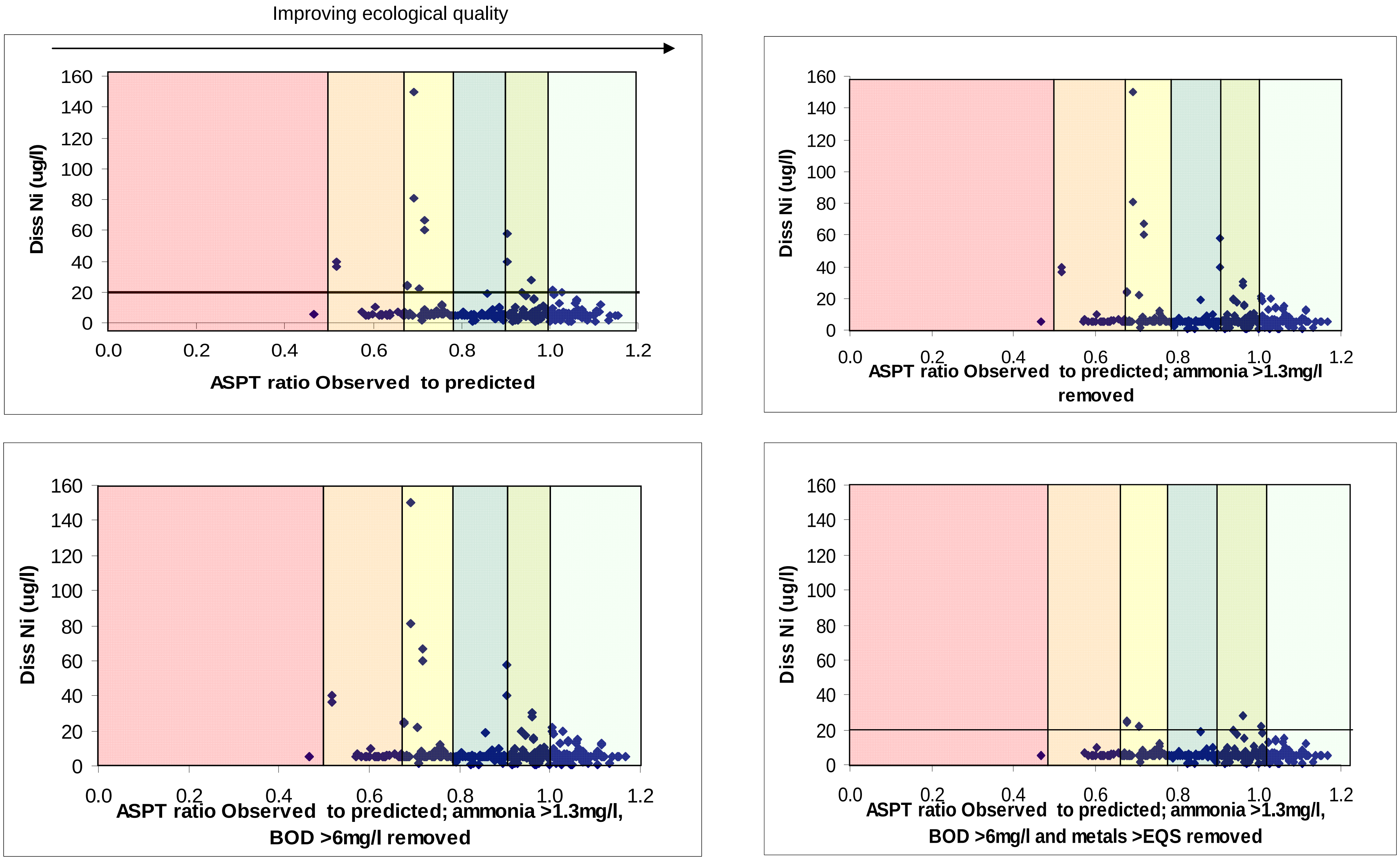

Figure 3.3 Dissolved nickel versus ASPT ratios

3.3 Implications for compliance monitoring

The data for nickel show that, in general, exceedances of the provisional WFD EQS of 20 µg/l are localised and associated with contaminated urban rivers or those receiving minewater drainage. Levels of compliance have improved over the past decade, with only around 1 per cent of rivers now exceeding the EQS (based on 2004 data). Improvements between Tier 1 and Tier 2 of the assessment are limited because of the relatively small (compared with the EQS) background addition at Tier 2.

Comparison with biological monitoring data shows that there is no correlation between nickel concentrations and ecological status. This reflects one of two reasons: either the metric is insensitive towards metal toxicity, which has been discussed previously (Environment Agency 2007), or the observed poor water quality is a result of another source of pollution. Cases where samples exceed the provisional EQS, but where ecological quality is considered ‘good’ or better may be as a result of the acclimatisation of indigenous biota to elevated concentrations of nickel; this has been demonstrated previously for copper (Bossuyt *et al*. 2000, Taylor *et al*. 2000) and zinc (Muyssen and Janssen 2000, 2001a, 2001b).

The WFD EQS for nickel is a provisional value. The relationship between the level of compliance and the number of samples exceeding any given EQS is, therefore, shown in Figure 3.4 for Environment Agency dissolved nickel monitoring data collected between 2000 and 2004, and in Figure 3.5 for the 2004 dataset alone.

A sharp rise in the level of exceedances may be expected if the EQS were to be significantly lowered, particularly if the value was below 10 µg/l. Earlier proposed standards were less than 2 µg/l, but the level of compliance relating to this value cannot be determined as the reported analytical limit of detection for dissolved nickel is 5 µg/l. If the current provisional value were to be lowered significantly (to less than 5 µg/l), there would be uncertainty about the number of sites in England and Wales that might be non-compliant without improved analytical performance.

The application of Tier 2 of the approach through the incorporation of a background concentration would improve the rate of compliance across the possible EQS range. After the finalisation of any region-specific EQSs based on the nickel RAR methodology, the compliance rate may be assessed once more, provided the WIMS sampling sites are assigned to the appropriate eco-region.

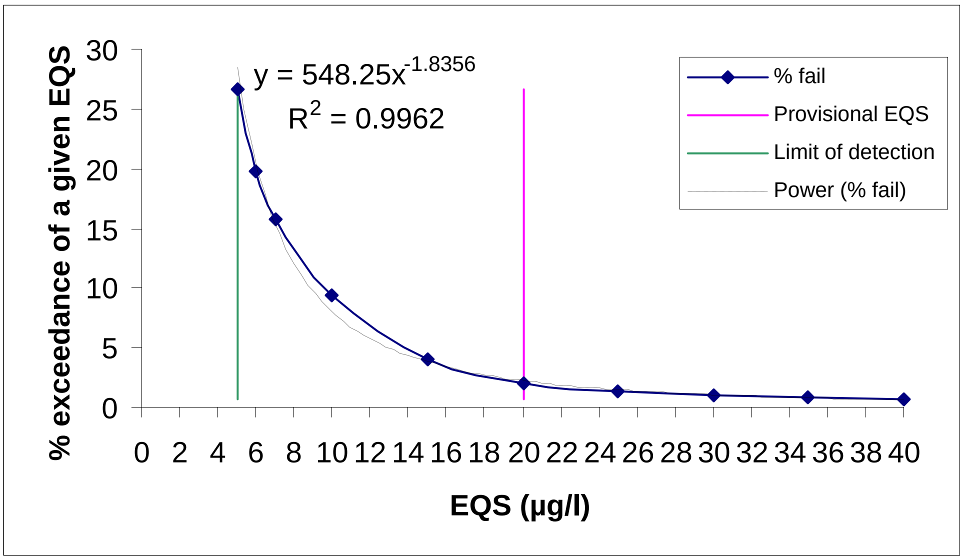

Figure 3.4 Degree of potential compliance versus any given nickel EQS for Environment Agency monitoring data (2000–2004)

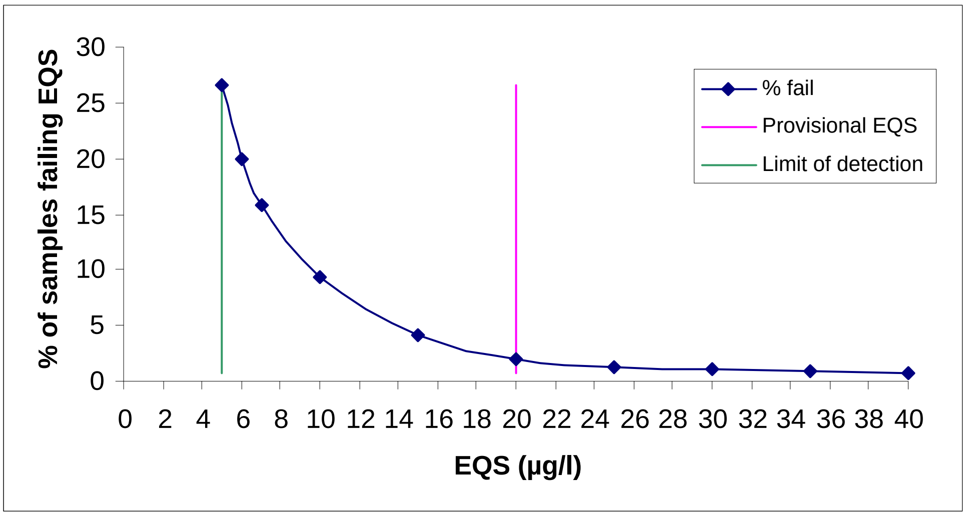

Figure 3.5 Degree of potential compliance versus any given nickel EQS for Environment Agency monitoring data (2004 only)

4 Conclusions

The following conclusions can be drawn from this preliminary assessment of a tiered approach to nickel compliance in surface waters:

- Sufficient data were obtained from the Environment Agency to assess the proposed tiered approach using a combination of individual year data (1995), which allowed a comparison of compliance versus river ecological status, and a range of data (1993–2004) for determining trends in compliance. These were applied to Tier 1 and Tier 2 of the assessment. Tier 3 may be completed at a later date if the Ni-BLM is made available.

- Trends over the past decade show a significant decrease in dissolved nickel concentrations across England and Wales with a commensurate increase in levels of compliance to up to around 99 per cent in 2004, based on average river concentrations and a provisional EQS of 20 µg/l.

- The proposed nickel EQS is a provisional value. Any significant decrease in this value, particularly below 10 µg/l, would increase the level of non-compliance significantly.

- Differences between the first two tiers of the assessment in terms of levels of compliance are limited because of the relatively small background addition (3.6 µg/l) to the 20 µg/l EQS for nickel.

- Sites where the provisional EQS is exceeded are mainly in either heavily urbanised catchments receiving industrial wastewater or water bodies receiving contaminated minewater drainage.

- For certain sites (e.g. those in the south west of England), non-compliance at both tiers of assessment was observed, but the water was still classified as of at least fair quality based on ASPT and BMWP scores and the number of taxa present. This may be due to:

  - the adaptation of organisms to high metal background concentrations, in which case the use of a global (and quite conservative) background value for nickel may not be applicable in metalliferous areas;

  - the possibility that these biological indices are a poor measure of metal pollution.

- The uncertainty over the final EQS and the setting of appropriate background concentrations for nickel means that definitive assessments of the impact of their use at Tier 2 cannot be fully evaluated at this stage.

5 Recommendations

Based on the interim data provided, a number of recommendations can be made to improve and strengthen the conclusions provided in Section 4:

- The Tier 3 assessment should be completed once a validated Ni-BLM is received.
- The assessment should be revised in light of any changes in the provisional nickel EQS of 20 µg/l upon completion of the RAR, particularly via the identification of appropriate eco-regions in conjunction with 'normalisation' for bioavailability.
- The assessment should be revised in light of any changes in agreed background nickel concentrations for the UK, particularly if more localised values are introduced.

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List of abbreviations

AF	assessment factor
ASPT	average score per taxon
BG_{med}	median background concentration
BLM	biotic ligand model
BMWP	Biological Monitoring Working Party
BOD	biochemical oxygen demand
DO	dissolved oxygen
DOC	dissolved organic carbon
EC10	concentration effective against 10 per cent of the organisms tested
EQI	ecological quality index
EQS	environmental quality standard
EU	European Union
GQA	General Quality Assessment
NOEC	no observed effect concentration
PEC	predicted environmental concentration
PNEC	predicted no-effect concentration
$PNEC_{add}$	predicted no-effect concentration to be added to background
RAR	risk assessment report
SSD	species sensitivity distribution
TGD	Technical Guidance Document
UK	United Kingdom
WIMS	Water Information Management System

Annex A Summary of selected sites and data available for the tiered assessment (1995 only)

			Concentration (mg/l)										
RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
MARLEY GAP BK	OUSE, STOCKS BR STIVE	19951004	4.48	0.35	----	94.64	1	17.17	5.33	0.73	16.67	F	0.466997
STOUR (09)	STURMINSTER NEWTON (90**)	19950409	2.75	0.18	219.04	89.74	1.67	4.33	5.33	2	8.33	F	0.466997
RED (06)	Rosecroggan Bridge	19951020	2.77	1.28	901.68	96.67	1	96.67	36.67	2	----	F	0.516605
ROCK DRYERS STREAM	BELOW ROCK DRIERS CP20/6	19951012	1.09	1.08	150.81	85.95	1	395	40	2	----	F	0.516605
LYNHER	Notter Bridge	19950330	1.33	0.06	45.96	96.42	1	8.14	5	2	21.43	F	0.570191
PENPONT WATER	Trelyn Bridge	19950410	0.57	0.02	16.71	97.89	----	2.5	5	----	----	F	0.570191
GREAT STOUR	BRETTS	19951016	2.1	0.1	265.64	98.8	9	----	7	----	----	E	0.574692
GREAT STOUR	VAUXHALL	19951016	2.36	0.05	266.67	109.36	1	----	7	2	----	E	0.574692
YEALM	BELOW YEALMPTON STW	19950921	1.67	0.1	67.08	96.47	1	2.53	5	2	----	F	0.582278
CONNON STREAM	HERODSFOOT BRIDGE	19950329	1.06	0.08	56.74	97.67	----	2.67	5	----	----	F	0.582278
WHITTING	WHITTINGTON MOOR	19951025	3.03	0.42	274	83.42	1.78	3.37	5.1	1	15.5	E	0.590219
TORRIDGE	100m d/s Rothern Br	19950914	2.56	0.04	54.46	111.17	1	2.39	5.14	2	5	E	0.590219
BY BROOK	MIDDLEHILL	19950320	1.49	0.05	294.76	95.8	----	2.5	5	----	----	E	0.59322
DONCOMBE STREAM	FORD JUST U/S OF ROAD BRIDGE	19950320	1.08	0.02	291.62	101.31	----	2.5	5	----	----	E	0.59322
THE CUT	ABOVE THAMES	19951108	3.13	0.48	324	86.46	3.25	8.5	5.5	1.1	32.75	E	0.599026
SMITHY BROOK (10)	MITCHELL CAMPERS	19950329	1.7	0.07	299.5	85.83	1	1.98	5.47	1	20	E	0.599026
AIRE	CASTLEFORD	19951127	5.02	1.49	210.89	77.28	6.1	5.61	10.01	1.75	27.58	E	0.603476
STOUR	DURWESTON (95**)	19951130	2.38	0.08	249.8	106.5	1	4.67	10	2	----	E	0.603476
FROME	LOWER BROCKHAMTON (95**)	19950515	2.09	0.1	255.27	106.89	----	2.75	5	----	----	E	0.612179
PIDDLE	U/S TURNERS PUDDLE (95**)	19950320	0.88	0.02	265.13	95.7	----	2.67	5	----	----	E	0.612179
ISLE RIVER	MIDELNEY PUMPING STATION (U/S SLUICE)	19950425	1.72	0.09	226.96	79.5	----	4.5	5.5	----	----	E	0.616216
TORRIDGE	50m u/s Beaford Br	19950915	2.25	0.04	52.99	103.17	1	2.56	5.5	2	5.25	E	0.616216
OZLEWORTH BROOK	PARK FARM/ ALDERLEY TROUT FARM	19950303	1.68	0.2	303.55	88.95	1	2.5	5	2	5	E	0.618677
LITTLE AVON	CHARFIELD	19950308	1.81	0.07	300	94.93	----	4	5	----	----	E	0.618677
TORRIDGE	100m u/s Beam Bridge	19950405	2.63	0.06	42.46	106.05	1	2.58	5	2	6.5	E	0.619765
MOLE (06)	50m u/s br park House Drive	19950911	1.8	0.05	46.7	100.86	1	3.38	5	2	5	E	0.619765
BISS	D/S TROWBRIDGE STW	19950501	4.51	0.32	279.11	82.7	1.5	4	5.5	2	8.5	F	0.620567
RODDEN BROOK	10M U/S BR, RODDEN MANOR	19950404	2.31	0.08	163.97	101.83	----	3	5.5	----	----	F	0.620567
COMBE HAVEN	SHEEPWASH GATES	19950523	1.34	0.17	----	59.31	1	----	5.5	1.25	----	E	0.628289
WALLERS HAVEN	BOREHAM BRIDGE	19950523	1.5	0.07	98.78	82.24	1	----	5.5	77.75	----	E	0.628289
MOLE	25m d/s FE discharge	19950911	2.43	0.14	49.3	100.2	1	3.35	5	2	----	E	0.633043
PEAGHAM STREAM	40m u/s rd br B3220	19950919	1.55	0.13	66.28	96.92	1	2.5	5	2	5	E	0.633043
DERWENT (02)	CLKBN DRF	19951122	2	0.07	233.75	105	1.12	2.95	5.2	1	11	E	0.634021
PIDDLE	WEST MILLS (90**)	19950509	1.82	0.04	258.19	100.71	1.4	2.5	5.2	2.5	11.3	E	0.634021
GWINDRA STREAM	Goonabarn	19951013	0.93	0.1	41.25	92.44	1	3.73	5	2	----	E	0.636364
CREEDY	150m u/s Field Bridge Westacott Cott.	19950504	1.87	0.06	105.11	96.84	1	2.5	5	2	----	E	0.636364
YEO (09)	NORTHOVER (30 M U/S ILCHESTER BRIDGE)	19950313	2.1	0.1	257.3	92.46	----	3	6	----	----	E	0.637838
FIVEHEAD RIVER	FIVEHEAD BRIDGE (43M D/S BRIDGE)	19950424	1.99	0.07	226.83	82.75	----	3.5	6	----	----	E	0.637838
PIDDLE	WEST MILLS (90**)	19950927	1.82	0.04	216.41	100.71	4.5	2.5	5.83	2	9.33	D	0.645045
NENT	ALSTON	19951010	1.6	0.03	252.33	97	1	2	5.78	19.33		D	0.645045
LEE (07)	AT WATERHALL	19951130	1.15	0.12	304.33	95.08	2.33	5.1	7	1.53	17.67	D	0.656772
BEULT	CROSS AT HAND	19950418	2.75	0.09	----	82.44	1	----	7	1.3	----	D	0.656772
BRISTOL AVON	COWHAM HANHAM GREEN 1	19950420	2.69	0.17	286.27	93.8	1.4	2.92	5.4	2	7.8	D	0.665557
OTTER	50m u/s ft br Dotton Mill	19951003	1.83	0.05	166.42	105.75	1	2.5	5.4	3.4	9.2	D	0.665557
AXE	100M U/S BRIDGE, NEAR LOXTON	19950424	1.99	0.12	321.83	86	----	2.5	5	----	----	D	0.667939
CHEDDAR YEO	10M U/S BOW BRIDGE, CROSS	19950411	1.34	0.06	263.52	103.57	----	2.5	5	----	----	D	0.667939
AIRE	D/S HICKSON & WELCH	19950411	5.52	0.89	162	68.5	7.89	4.12	5.29	1.06	26	D	0.671053
THAMES	AT TEDDINGTON WEIR 2	19950514	1.65	0.24	296	96.51	1	4.97	5.33	0.7	9	D	0.671053
OZLEWORTH BROOK	D/S NIND FISH FARM	19950308	2.05	0.32	290.9	87.71	1	2.5	5	2	5	D	0.672131
OZLEWORTH BROOK	PARK FARM/ ALDERLEY TROUT FARM	19950904	1.68	0.2	312.88	88.95	1.75	1.3	5	2	----	D	0.672131
PARRETT RIVER	WESTOVER BRIDGE (5M U/S TRIB. CONFLUENCE)	19951012	2.52	0.1	287.22	91.8	2	3.33	7	2.67	9.33	D	0.672185
YEO (09)	GOLDINGS LANE	19950321	1.42	0.07	335.15	93.2	----	2.5	7	----	----	D	0.672185
TONE RIVER	BISHOPS HULL (D/S	19950330	2.12	0.07	182.97	90.77	----	2.75	5	----	----	D	0.676157

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
	TYTHERLEIGH HOUSE POOL)												
HALSEWATER	TONE VALE (35M D/S ROAD BRIDGE)	19950329	1.62	0.07	162.46	92.08	----	2.5	5	----	----	D	0.676157
FELBRIDGE WATER	WOODCOCK BRIDGE	19950413	2.27	0.4	----	67.55	1	----	24	1	----	D	0.6768
FELBRIDGE WATER	WOODCOCK BRIDGE	19951023	2.27	0.4	----	67.55	31	----	24.67	2	----	D	0.6768
THE CUT	ABOVE THAMES	19950330	3.13	0.48	305.67	86.46	1	4.93	5.67	1	12.9	D	0.677228
YEO (09)	YEOVIL (15 M U/S A30 BRIDGE)	19950313	2.12	0.11	263.04	95.22	----	2.7	5.6	----	----	D	0.677228
HAMPSHIRE AVON	U/S RINGWOOD STW (95**)	19950530	1.71	0.05	241.52	101.32	3	2.5	5	2	5	D	0.680751
DITCHEND BROOK	REDBROOK (95**)	19950419	1.8	0.04	31.52	95.55	----	2.5	5	----	----	D	0.680751
CAUNDLE BROOK	CORNFORD BRIDGE (95**)	19950322	2.64	0.13	188.9	88.66	----	3.5	5.33	----	----	D	0.681373
SHERFORD RIVER	SHERFORD BRIDGE (95**)	19950403	1.96	0.07	172.7	88.47	----	3	5.33	----	----	D	0.681373
BRSITOL AVON	KEYNSHAM D/S WIER U/S ROAD BRIDGE 1	19950502	3.01	0.39	288.6	89.06	1	3	5	2	6	D	0.681518
ST. CATHERINES BROOK	A4 U/S OF CONFLUENCE WITH AVON	19950309	2.09	0.04	299.76	93.5	----	2.5	5	----	----	D	0.681518
CRANE (07)	AT NORTHCOTE ROAD, ISLEWORTH	19950918	4.03	0.26	311	90.25	1	8.4	5.5	2.2	21.5	D	0.682261
GREAT STOUR	VAUXHALL	19950330	2.36	0.05	279.33	109.36	1	----	5.5	0.5	----	D	0.682261
ADUR EAST	WORTLEFORD BRIDGE	19951031	2.74	0.15	----	83.71	1	----	6	2	----	D	0.683241
EASTERN YAR	BRADING	19950512	1.55	0.13	157	88.08	1	----	6	0.5	----	D	0.683241
STANBRIDGE STREAM	50M D/S PETERSFIELD STW	19950512	2.94	1.02	----	82.99	1	----	5.33	1.5	----	D	0.686924
GREAT STOUR	WYE	19950330	2.31	0.17	261.33	89.05	1	----	5.33	1.23	----	D	0.686924
THAMES	AT TEDDINGTON WEIR 2	19951122	1.65	0.24	264.33	96.51	2	5.27	5	1.13	16	E	0.688433
COLNE (07)	AT BUSHEY MILL LANE	19950911	2.44	0.09	343	92.18	1	35.65	5	4.6	39	E	0.688433
HONEYBALL STREAM	U/S STW	19950405	2.6	1.1	----	77.39	1	3.8	150	2	120	D	0.691011
CARNON	Devoran Bridge	19950322	1.49	0.43	169.24	89.72	6.25	525.79	81.05	12.8		D	0.691011
PIX BROOK	RESERVOIR OUTLET LETCHWORTH	19950904	3.63	0.22	----	119.95	1	6.4	22	3.2	36	D	0.705491
GREAT STOUR	WYE	19951016	2.31	0.17	253	89.05	2	----	22.33	2.33	----	D	0.705491
BANWELL	40M U/S BRIDGE, WAYWICK	19950425	2.02	0.27	265.48	81.83	----	2.5	5	----	----	D	0.707269
CONGRESBURY YEO	25M U/S BEAM BRIDGE, WRINGTON	19950314	1.76	0.14	301.17	91.46	----	2.5	5	----	----	D	0.707269
DERWENT (10)	LOW HUTTON	19951108	1.53	0.15	231	90.73	1	1.25	1.37	1	5	D	0.709163
DERWENT (02)	EDDYS BR	19951109	1.4	0.05	58.56	95	1	1.21	1.35	1.54	15.2	D	0.709163
BODILLY STREAM	Bodilly Mill	19950313	0.55	0.04	43.33	95.88	----	2.75	5	----	----	D	0.713128
INNY	St Clether Bridge	19950410	0.94	0.02	56.18	99.35	----	2.5	5	----	----	D	0.713128
STOUR	D/S GILLINGHAM STW (92**)	19950330	2.2	0.14	253.33	97.09	1	2.75	5	2	5	D	0.715753
STOUR	U/S GILLINGHAM STW (95**)	19950330	2.52	0.05	216.65	100.5	1	2.5	5	2	7.5	D	0.715753
FOWEY	Respryn Bridge	19950324	1.07	0.02	27.81	98.89	1	2.58	5	2	9.33	D	0.715867
FOWEY	Respryn Bridge	19950906	1.07	0.02	17.18	98.89	1	2.67	5	2	6.17	D	0.715867
KIRKBY BROOK	PTC RIVER ALT	19951004	4.1	0.26	191	81.68	2.09	8.59	8.17	1.6	----	D	0.716561
CALDER (10)	D/S HEBDEN BRIDGE	19950515	2.08	0.22	53.78	95.32	1.71	6.03	8.35	1.09	20	D	0.716561
CARNON	Devoran Bridge	19951017	1.49	0.43	395.17	89.72	5	329.5	60	10.5		D	0.717728
CARNON	Bissoe Bridge	19951019	2.04	0.23	126.39	92.58	5	500	66.67	10	2800	D	0.717728
ANCHOLME	NEW RIVER ANCHOLME HORKSTOW BRIDGE	19950925	3.1	0.14	439	122.43	1	3.1	6	0.5	2	D	0.719368
NEW BEDFORD / HUNDRED FT R	EARITH BR 1	19950522	2.79	0.08	383.88	107.32	1	4.63	6	1.03	6	D	0.719368
CONNON STREAM	Trevillis Wood	19950329	0.99	0.06	55.51	96.45	----	3.33	5	----	----	D	0.719858
WEST LOOE	Churchbridge	19950324	1.01	0.03	64.39	98.58	----	2.5	5	----	----	D	0.719858
MERE	150m u/s Farm Br Greatwood	19950922	2.11	0.1	80.2	89.64	1	2.83	5	5	6.67	E	0.723327
MARAZION	Truthwell Mill Bridge	19950302	0.94	0.02	84.25	94.69	----	5	5	----	----	E	0.723327
BY BROOK	BATHFORD D/S ROAD BRIDGE	19950907	1.87	0.19	288.63	93.46	2	3.7	5	2	----	D	0.727955
LITTLE AVON	WICKWAR D/S STW	19950303	1.81	0.15	289.32	85.07	----	4	5	----	----	D	0.727955
BRISTOL AVON	MONKTON HOUSE	19950501	2.93	0.17	281.98	88.23	----	4	6	----	----	D	0.732943
BERRYFIELD BROOK	HOLBROOK FARM	19950419	2.75	0.15	311.2	74.15	1	5	6	2	10	D	0.732943
TORRIDGE	125m d/s Newbridge	19950915	2.56	0.05	59.98	102.53	1	7.38	6	2	7.5	D	0.737769
BOLINGEY STREAM	Ponsmere Bridge	19950315	0.66	0.04	98.77	86.31	----	4	6	----	----	D	0.737769
PARRETT RIVER	WESTOVER BRIDGE (5M U/S TRIB. CONFLUENCE)	19950424	2.52	0.1	267.43	91.8	1.25	3.92	5	2	6	D	0.738596
SUTTON BINGHAM STREAM (EAST)	FARMERS END	19950426	1.63	0.03	242.22	97.77	----	2.5	5	----	----	D	0.738596
DIVELISH	U/S ROLLS MILL (95**)	19950327	2.28	0.12	212.56	96.05	----	3.17	5.33	----	----	D	0.740402
FONTMELL BROOK	D/S FONTMELL PARVA (95**)	19950327	1.29	0.05	249.4	94	----	2.67	5.33	----	----	D	0.740402
PYESTOCK TRIBUTARY	AT IVELEY ROAD, FARNBOROUGH	19951120	2.21	0.4	244	80.69	1.33	17.4	6	0.53	44.33	E	0.740812
NENE	WANSFORD OLD ROAD BRIDGE 1	19950411	2.64	0.09	355.43	100.35	1	2.5	6	2	5	E	0.740812
BYDEMILL BROOK	D/SCORSHAM STW/ THINGLEY STW	19950412	1.73	0.41	333.14	93.07	1.5	3.5	8	2	9.5	D	0.743842
BRISTOL AVON	BITTON	19950504	2.74	0.14	262.18	96.72	1	3	8	2	7	D	0.743842
BRUE	150M U/S BASON BRIDGE	19950308	2.89	0.19	309.16	84.69	----	3.5	5.5	----	----	D	0.745421
HUNTSPILL	200M U/S BRIDGE, SLOWAY LANE, HUNTSPILL	19950308	3.91	0.14	346.95	102.75	----	3.5	5.5	----	----	D	0.745421

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
BRISTOL AVON	U/S LACKHAM COLLEGE STW D/S CHIPPENHAM STW	19950412	2.36	0.15	270.2	91.48	1	3.25	6	2	9	D	0.752918
BRISTOL AVON	MELKSHAM ABOVE ROAD BRIDGE	19950419	2.9	0.14	279.27	94.56	----	3	6	----	----	D	0.752918
BLACKBURN BROOK (10)	AT A6109	19951005	2.34	0.37	251.5	78.26	1.5	4.25	11.84	1.01	15	D	0.755627
AXE	25M U/S BRIDGE, LOWER WEARE	19951115	2.46	0.11	380.02	89.43	1.33	2.2	10.83	2	----	D	0.755627
WHITTING	WHITTINGTON MOOR	19950523	3.03	0.42	244.5	83.42	1.71	2.23	5.28	1.36	21	D	0.756318
HOOKE	HOOKE (95**)	19950308	1.63	0.12	----	93.38	1.5	3.13	5.25	2.5	16	D	0.756318
BRISTOL AVON	CHIPPENHAM	19950412	2.13	0.12	273.06	93.86	1	3	6	2	6	D	0.757282
CHARLTON STREAM	CHARLTON/MILBOURNE	19950327	1.62	0.06	263.63	101.54	----	2.5	6	----	----	D	0.757282
OTTER	Cottarson,50m d/s Weir,100m d/s farm house	19950424	2.17	0.08	117.56	99.92	1	2.5	5	2	----	D	0.757679
OTTER	Cottarson,50m d/s Weir,100m d/s farm house	19951009	2.17	0.08	139.71	99.92	3.5	2.9	5	2	----	D	0.757679
TAVY	Denham Bridge	19950406	1.42	0.02	31.75	99.01	1	4.14	5	2	8.71	D	0.758123
TAVY	Denham Bridge	19950904	1.42	0.02	32.88	99.01	1	4.83	5	2	7.17	D	0.758123
CARBIS STREAM	prior to Par River	19951113	1.04	0.06	33.42	94.39	1	4.83	5	2	----	D	0.758993
CAMEL	Polbrock	19950327	1.24	0.03	45.02	95.37	1	2.92	5	2	9.17	D	0.758993
MERE	300m u/s A386 Br 50m u/s Pylons	19950922	1.46	0.12	66.2	88.52	1	2.25	5.75	2	----	D	0.759328
MERE	150m u/s Farm Br Greatwood	19950329	2.11	0.1	58.87	89.64	1	2.5	5.75	2	7.5	D	0.759328
CRANE (07)	AT NORTHCOTE ROAD, ISLEWORTH	19950427	4.03	0.26	322.5	90.25	1.5	9.35	6	3	19.5	D	0.760649
RAY	AT MOREDON BRIDGE, SWINDON	19951115	2.47	0.17	350	77.7	1	7.5	6	2.6	35	D	0.760649
SEMINGTON BROOK	WHISTLEY BRIDGE	19950306	3.91	0.61	258.76	81.63	1	8.5	7	3	20	D	0.763203
CAMEL	BELOW WENFORD DRIES	19951011	3.61	0.04	146.38	90.57	1	4.83	7	2	----	D	0.763203
FAL	Kernick Bridge	19951016	0.99	0.09	56.38	96.07	1	6.5	8	2	----	C	0.765372
HAYLE	Godolphin Bridge	19950303	0.93	0.04	84.55	98.91	----	85	8	----	----	C	0.765372
BRISTOL AVON	D/S AVONCLIFF WEIR	19950502	3.48	0.19	255.54	95.92	1	3	6	2	5	C	0.768939
SEMINGTON BROOK	BULKINGTON	19950310	1.72	0.04	282.67	93	----	2.5	6	----	----	C	0.768939
FAL	Tregoney Gauging Station	19950321	1.28	0.19	51.55	96.54	1	3.83	5	2	31.67	C	0.772727
GWINDRA STREAM	Gwindra Bridge	19950320	0.87	0.07	37.67	98.36	----	3.33	5	----	----	C	0.772727
HYNDBURN BROOK	PTC RIVER HYNDBURN	19951011	2.47	0.4	167.25	90.44	1.31	5.09	5	0.91	104.85	C	0.775348
WYRE (03)	D/S ST. MICHAELS BRIDGE	19951012	3.35	0.18	137.13	94.66	1	2.49	5	0.69	6.52	C	0.775348
WASHFORD RIVER	KENTS FORD FARM (60M U/S WEIR)	19950419	1.58	0.1	146	97.55	----	2.5	5	----	----	C	0.779886
DONIFORD STREAM	STOGUMBER STATION (25M U/S)	19950421	1.36	0.06	156.45	95.69	----	3	5	----	----	C	0.779886
COBER	Trenear Bridge	19950313	0.84	0.02	33.76	95.85	----	10	5	----	----	C	0.786164
KENNAL	Tregolls Bridge	19950314	0.93	0.01	31.93	95.22	----	6	5	----	----	C	0.786164
BRUE	200M D/S BRIDGE, ALFORD	19950323	1.77	0.14	290.4	94.46	----	2.5	5	----	----	C	0.786618
BRUE	150M U/S BRIDGE, GANTS MILL (U/S BRUTON STW)	19950320	1.69	0.12	263.76	96	----	2.5	5	----	----	C	0.786618
SOUTH TYNE	HALTWHISTLE	19950411	1.4	0.05	79.33	102	1.03	1.55	3.77	5.1	125.5	C	0.788955
MURK ESK	GROSMONT	19950504	1.4	0.04	45.93	96.84	1	1	4	----	30	C	0.788955
WEST LOOE	Scawn Mill Bridge	19950329	1.44	0.12	74.53	97.17	----	2.5	5	----	----	C	0.791594
LYNHER	Notter Bridge	19950906	1.33	0.06	46.33	96.42	1	8.17	5	2	30	C	0.791594
SOUTH TYNE	WARDEN	19950411	1.8	0.05	90.23	106	1.07	1.42	2.12	4.7	92.67	D	0.792079
WEAR	WOLSINGHAM	19950410	1.4	0.04	77.07	102	1	1.78	2.1	6.98	43	D	0.792079
TREGESEAL STREAM	prior to Sea	19950301	0.8	0.06	49.03	98.94	----	6	5	----	----	C	0.793165
MARAZION	Nancledra	19950302	0.97	0.02	33.14	95.53	----	3.5	5	----	----	C	0.793165
HAMPSHIRE AVON	D/S AMESBURY (95**)	19950503	1.48	0.05	261.95	104.71	----	2.5	5	----	----	C	0.8
HAMPSHIRE AVON	AVON BRIDGE (90**)	19950503	1.53	0.03	266.44	111.43	----	2.5	5	----	----	C	0.8
HILLFARRANCE BROOK	D/S MILVERTON S.T.W. (15M D/S TRACK BRIDGE)	19950329	1.55	0.12	194.43	91.46	----	2.83	5	----	----	C	0.801471
HILLFARRANCE BROOK	U/S MILVERTON S.T.W. (5M U/S BRIDGE)	19950329	1.28	0.03	192.47	91.15	----	3	5	----	----	C	0.801471
SEMINGTON BROOK	SEMINGTON U/S ROAD BRIDGE	19950310	2.19	0.07	304.25	97.15	----	3	6	----	----	E	0.801688
HAMPSHIRE AVON	GALLOWS HILL (95**)	19950503	1.43	0.04	278.7	113.71	----	3.67	6	----	----	E	0.801688
DOVE (10)	DARFIELD	19950315	3.55	1.24	329.85	79.96	1	2.69	7.44	1	20	C	0.804233
MARDEN	STANLEY	19950412	2.46	0.1	308.7	94.06	2	5.75	7.25	2	8.5	C	0.804233
BEVERLEY BROOK	AT MOTSPUR PARK	19950510	7.06	1.4	278.5	63.12	1	6.45	5	1.6	49.5	C	0.807477
MIMMSHILL BROOK	AT WATEREND	19950911	3.07	0.09	282.5	98.6	1.5	8.05	5	1.4	22	C	0.807477
TORTWORTH BROOK	SODAMILL CROMHALL	19950303	1.87	0.23	267.93	85.53	----	4	5.5	----	----	C	0.807985
WELLOW BROOK	50 M D/S DISUSED BRIDGE, WRITHLINGTON	19950511	2.79	0.15	308.3	86.5	1.5	3	5.5	2	9.5	C	0.807985
MEDWAY	HARTLAKE BRIDGE	19950420	3.24	0.19	111	95.8	1	----	5	2	----	C	0.814
MEDWAY	WHILLETS BRIDGE	19951017	2.21	0.17	129	82.83	1.5	----	5	2	----	C	0.814
SHELL BROOK (05)	ARDINGLY TREATMENT WORKS	19950516	1.77	0.1	75.26	93.56	1	----	5	2	----	C	0.81854
SHELL BROOK (05)	ARDINGLY TREATMENT WORKS	19951017	1.77	0.1	87.71	93.56	1	----	5	2	----	C	0.81854
STOUR	ECCLIFFE (95**)	19950330	2.1	0.11	242.81	96	----	2.83	5.33	----	----	C	0.822097
STOUR	LOWER FARM (95**)	19950405	1.73	0.06	258.07	92.55	----	3	5.33	----	----	C	0.822097

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
				Concentration (mg/l)									
NANCEGOLLAN STREAM	Trenwheal	19950303	1.09	0.05	65.34	94.29	----	10	5	----	----	C	0.823214
HAYLE	Binner Bridge	19950303	1.19	0.04	68.07	94.56	----	10	5	----	----	C	0.823214
FOSS	WEST LILLING	19951031	2.33	0.1	357.67	128.5	1.08	1.03	1	1	11.67	C	0.825
DERWENT (10)	LOFTSOME BRIDGE 1	19951108	1.51	0.07	276	94	1	0.76	1	1	5	C	0.825
SEMINGTON BROOK	LITTLETON PANELL	19950307	1.48	0.1	301.93	92.4	1	2.5	5	2.5	7.5	C	0.826958
BISS	BROOK HOUSE D/S WEST WILTS TRADING ESTATE	19950424	1.74	0.06	300.99	101.5	----	2.5	5	----	----	C	0.826958
POULSHOT STREAM	JENNY MILL	19950306	2.69	0.53	309.34	85.83	1	4.25	5.75	2.25	12.5	C	0.827715
DERWENT (02)	LINTZFORD	19950523	1.9	0.05	205.67	92	1	2.39	5.77	1.06	21.67	C	0.827715
GAUZE BROOK	RODBOURNE PUMPING STATION	19950330	1.87	0.13	285.54	84.61	----	2.75	5.5	----	----	C	0.829545
MILBOURNE BROOK	PINKNEY FARM	19950310	1.66	0.07	329.54	93.39	----	3	5.5	----	----	C	0.829545
AXE (SOUTH)	10M U/S ROAD BRIDGE, BLEADNEY	19950411	1.86	0.13	285.85	103.71	----	2.5	5	----	----	C	0.830357
AXE	25M D/S GATE ON TRACK, U/S OF PIPE, CLEWER	19950411	1.32	0.05	276.95	98.14	----	2.5	5	----	----	C	0.830357
WISKE	YAFFORTH	19950915	2.09	0.12	394.67	76.4	1	3.08	1.57	1	16.25	C	0.830935
DERWENT (10)	LOFTSOME BRIDGE 1	19950516	1.51	0.07	263	94	1	1.79	1.46	1	20	C	0.830935
SUTTON BINGHAM STREAM (WEST)	NETHERSTOKE	19950426	2.11	0.15	232.38	86.35	----	2.5	5	----	----	C	0.830986
SUTTON BINGHAM STREAM (EAST)	HALSTOCK (U/S BRIDGE & OUTFALL)	19950426	2.79	0.12	229.8	96.92	----	3.5	5	----	----	C	0.830986
MOORS	D/S A31 ROADBRIDGE (95**)	19950531	1.88	0.03	202.89	87.27	----	2.5	5	----	----	C	0.832061
CRANE	ROMFORD (95**)	19950508	1.93	0.03	243.31	101.36	----	2.5	5	----	----	C	0.832061
SOUTH TYNE	WARDEN	19950926	1.8	0.05	193.33	106	1.09	1	1.02	1.06	12.87	C	0.841121
COMBE BECK	AT NY224253	19950306	1.13	0.02	12	98.81	0.5	0.5	1.04	1.56	13.4	C	0.841121
COWAGE BROOK	LOWBRIDGE	19950412	1.96	0.22	272.33	85.15	----	3.25	5	----	----	C	0.842478
BRISTOL AVON	DAUNTSEY PARK D/S WEIR	19950330	1.5	0.08	307.34	91.25	----	2.5	5	----	----	C	0.842478
WASHFORD RIVER	ROADBRIDGE (D/S ROADWATER FISH FARM)	19950419	1.43	0.04	114.63	93.82	1	2.5	5	2	----	C	0.843396
WASHFORD RIVER	ROADBRIDGE (D/S ROADWATER FISH FARM)	19951009	1.43	0.04	148.45	93.82	3.67	1.7	5	2.67	----	C	0.843396
GODOLPHIN STREAM	Gwedna	19950314	1.13	0.05	85.04	95.78	----	65	6	----	----	C	0.844055
HOLYWELL STREAM	Trelaske	19950315	0.82	0.02	122.81	93.98	----	3	6	----	----	C	0.844055
HAMPSHIRE AVON	DOWNTON (90**)	19950522	2.58	0.12	260.14	90.73	2.67	2.5	5	2	5.67	C	0.844444
CAUNDLE BROOK	WARR BRIDGE (90**)	19950322	1.82	0.11	186.81	81.32	----	3.17	5	----	----	C	0.844444
GREAT STOUR	LONGPORT BRIDGE	19950330	2.18	0.2	----	93.24	1.33	----	6	1.27	----	C	0.845173
MEDWAY	U/S ALLINGTON SLUICES	19950420	2.96	0.1	146.93	97.51	2.9	----	6	3	----	C	0.845173
FROSTWATER (CADBROOK)	BROOK GREEN (35M U/S ROAD BRIDGE)	19950406	1.82	0.08	151.61	86.92	----	3.67	5.33	----	----	C	0.846918
CREEDY	150m u/s Field Bridge Westacott Cott.	19951006	1.87	0.06	187.17	96.84	1	1.77	5.33	2	----	C	0.846918
TORY BROOK	Portworthy Bridge	19950406	0.96	0.05	25.7	97.09	----	3	5	----	----	C	0.847122
CAMEL	Polbrock	19950914	1.24	0.03	54.9	95.37	1	2.83	5	2	9.17	C	0.847122
TINKER BROOK	PTC WHITE ASH BROOK	19950321	2.21	0.3	101.52	97.01	1.41	20.78	5.6	2.36	----	D	0.848197
DART	10m d/s Dart Bridge Buckfastleigh	19951030	1.46	0.01	29.28	99.33	1	1.8	5.6	5.8	----	D	0.848197
CHERWELL	AT MARSTON ROAD, OXFORD	19951023	2.49	0.2	305.75	92.5	1.25	5.4	5	0.65	6.75	C	0.848263
THAMES	AT WATER INTAKE, BUSCOT	19951114	2.04	0.1	316	95.35	17.67	4.6	5	0.8	14.67	C	0.848263
PAR BROOK	PARBROOK BRIDGE	19950505	4.53	0.43	----	68.64	1.33	----	5	1.6	----	C	0.851638
TEST	BROADLANDS (LONGBRIDGE)	19950421	1.98	0.07	----	105.22	1	----	5	1.5	----	C	0.851638
NEW BLIND YEO	70M U/S BRIDGE,WT STATION (D/S OF CLEVEDON)	19950419	2.57	0.11	342.58	100.5	----	2.5	5	----	----	C	0.85283
TETBURY AVON	BACK BRIDGE	19950327	1.53	0.04	292.05	92.6	----	2.5	5	----	----	C	0.85283
EAST LOOE	Trussel Bridge	19950329	2.33	0.07	92.48	97.28	----	2.67	5	----	----	C	0.855754
BOKIDDICK BROOK	Lowertown Farm	19950323	0.79	0.07	37.46	86.22	----	2.5	5	----	----	C	0.855754
CEFNI	U/S CEINT	19950419	5.13	0.29	116.4	95.9	1.25	3.37	18.67	----	4	C	0.857143
CALDER (10)	D/S HEBDEN BRIDGE	19950928	2.08	0.22	93.18	95.32	8.7	5.7	18.73	1.78	39.85	C	0.857143
BRISTOL AVON	STAVERTON U/S OF WEIR AT NESTLES FACTORY	19950501	2.68	0.11	289.07	98.2	----	3.5	5	----	----	C	0.858779
WOOLLEY BROOK	A4 ROAD BRIDGE AT LAMBRIDGE	19950309	1.56	0.03	292.27	96.57	----	2.5	5	----	----	C	0.858779
LYDDEN	U/S CANNINGS COURT (95**)	19950322	3.12	0.48	201.4	87.49	----	3	5	----	----	C	0.858801
WONSTON	D/S WONSTON (95**)	19950322	2.38	0.14	173.94	87.94	----	3	5	----	----	C	0.858801
SUTTON BINGHAM STREAM	U/S RAILWAY BRIDGE, STOFORD	19950426	2.31	0.14	225.58	87.08	----	2.5	5	----	----	C	0.859287
CAM	BRIDGEHAMPTON	19950313	1.55	0.07	349.59	88.39	----	2.5	5	----	----	C	0.859287
CALDER (03)	200M U.S. RAILWAY BRIDGE NEAR SELLAFIELD	19951011	0.95	0.29	----	103.48	1	0.95	5	0.5	5	C	0.860963
MARRON	10M D.S. WOODEND BRIDGE	19950314	1.63	0.06	----	98.82	0.51	0.84	5	0.5	5	C	0.860963

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
WINDRUSH	AT GS, NEWBRIDGE	19950517	1.95	0.07	299	100.73	15.33	2	5	0.5	2.67	C	0.861446
WINDRUSH	AT GS, NEWBRIDGE	19951002	1.95	0.07	286	100.73	1	2.9	5	0.5	7	C	0.861446
BACK BROOK	D/S DIMMER TIP (8M U/S ROAD BRIDGE,LOVINGTON)	19950404	4.13	0.56	407.88	81	2.75	4.75	6.5	2	5	C	0.862715
BULKINGTON DROVE STREAM	GASTON GREEN	19950310	3.61	0.2	290.3	83.15	----	3.5	6.5	----	----	C	0.862715
PIDDLE	TRIGON (95**)	19950509	1.65	0.06	268.16	94.78	1.75	2.5	5	2	8	C	0.863014
PIDDLE	HYDE (95**)	19950509	1.28	0.04	269.43	104.13	----	2.5	5	----	----	C	0.863014
FAL	Retew Bridge	19951016	1.14	0.12	39.42	92.76	1	2.83	5	2	----	C	0.868376
CARBIS STREAM	d/s Wheal Prosper Mica Dam	19951013	1.08	0.03	23.78	94.85	1	2.8	5	2	----	C	0.868376
TORY BROOK	Marsh Mills Bridge	19950405	1.09	0.04	52.42	99.8	----	5.33	5	----	----	C	0.870796
TAMERTON FOLIOT STREAM	Tamerton Foliot (d/s Trib)	19950406	1.24	0.03	92.45	95.99	----	2.5	5	----	----	C	0.870796
AIRE	CALVERLEY BRIDGE	19950920	4.97	0.29	189.75	76.13	7.41	8.06	8.81	1.18	23.33	C	0.87108
FAL	Tregoney Gauging Station	19951016	1.28	0.19	63.18	96.54	1	5.71	8.71	2	45.71	C	0.87108
TEN MILE	DENVER SLUICE 2	19951127	2.74	0.16	328.4	99.3	0.66	4.89	4.47	0.54	23.17	C	0.874755
GAUNLESS	US R WEAR	19950503	1.8	0.08	----	99	1.27	7.28	4.5	1.62	20	C	0.874755
SOMERSET FROME	50M U/S BR, FRESHFORD	19950515	2.32	0.1	231.73	98.55	2	4	5	2	----	C	0.875472
BISS	NORTH BRADLEY	19950424	1.62	0.1	268.37	97.31	----	4	5	----	----	C	0.875472
CLAW	Claw Bridge	19950418	2.69	0.09	34.98	90.06	----	2.88	5	----	----	C	0.877224
CAREY	Boldford Bridge	19950411	1.52	0.04	34.76	91.28	----	2.5	5	----	----	C	0.877224
SOUTH BROOK	MELKSHAM D/S STW	19950419	8.21	4.1	310.09	68.54	3	4	5	2	7	C	0.877863
BRISTOL AVON	MELKSHAM AT SCOTLAND ROAD	19950419	2.83	0.12	279.07	94.53	----	3	5	----	----	C	0.877863
CRIMPLE BECK	BLACKSTONES	19951025	4.44	2.25	174.5	77	1	6.18	2.65	1.09	54.65	C	0.877953
DERWENT (02)	RUFFSIDE	19950511	1.1	0.05	26.97	97	1	1.06	2.67	12.95	87.5	C	0.877953
ISLE RIVER	BEREMILLS FARM (13M U/S FIELD BRIDGE)	19950406	3.36	0.45	----	90.94	1	4.6	5	2	6.8	C	0.878229
ISLE RIVER	BRADON BRIDGE (100M U/S BRIDGE)	19950424	2.3	0.14	182.89	87.77	----	3	5	----	----	C	0.878229
BRISTOL AVON	MALFORD CHURCH D/S SUTTON BENGER STW	19950404	1.71	0.16	304	91.86	----	2.67	5	----	----	C	0.883721
BRISTOL AVON	MALMESBURY D/S BRIDGE	19950327	1.75	0.04	292.88	93.55	----	2.5	5	----	----	C	0.883721
RIVERS BROOK	QUMERFORD U/S CONFLUENCE WITH MARDEN	19950405	2.14	0.29	390.53	92	1	2.5	9.67	2	10	C	0.88535
ARUN	WELLCROSS BRIDGE	19950503	3.88	0.25	----	78.43	2.67	----	10	1.5	----	C	0.88535
TORRIDGE	300m d/s town Mills Torrington	19950914	2.29	0.05	53.22	103.08	1	2.5	5	2	21.25	C	0.886538
ST ERTH STREAM	Treloweth	19950302	0.86	0.04	99.58	94.18	----	5.5	5	----	----	C	0.886538
WEAR	SHINCLIFFE	19950410	2.1	0.24	143.87	86	2.15	2.06	2.85	3	31.67	C	0.889094
DON (10)	DUNFORD BRIDGE	19950322	1.45	0.07	34.07	91.88	1	1.47	2.91	1.42	20	C	0.889094
PILL RIVER	BILBROOK FORD (20M U/S BRIDGE)	19950419	1.79	0.07	276.48	96.31	----	2.5	5	----	----	C	0.889098
AVILL	FRACKFORD BRIDGE (30M U/S)	19950418	1.21	0.02	101.8	96.57	----	3.17	5	----	----	C	0.889098
EAGLEY BROOK	U/S CHARLES TURNER	19950524	2.22	0.12	28.63	86.78	90.03	3.27	5	1.09	14.78	C	0.889908
EAGLEY BROOK	U/S CHARLES TURNER	19951129	2.22	0.12	58.73	86.78	215.33	4.01	5	1.51	19.43	C	0.889908
SOWE	BAGINTON MILL	19950911	1.82	0.11	----	88	3.15	4.02	5.53	2.59	10.52	C	0.890838
ASKER	CONEYGAR (91**)	19950301	1.76	0.04	222.86	102.22	----	3.25	5.5	----	----	C	0.890838
BRISTOL FROME	FRAMPTON COTTERELL	19950310	2.36	0.12	248.31	96.08	----	4	5.33	----	----	C	0.893788
SISTON BROOK	WILLSBRIDGE D/S OF BRIDGE	19950313	2.13	0.08	292.22	97.77	----	4.67	5.33	----	----	C	0.893788
KIRKBY BROOK	PTC RIVER ALT	19950526	4.1	0.26	200.5	81.68	1.08	7.12	5.55	1.48	----	C	0.894636
THAME	AT DORCHESTER BRIDGE	19950918	1.83	0.07	330.8	88.02	9.2	5.02	5.6	0.52	12.4	C	0.894636
PIDDLE	TRIGON (95**)	19950927	1.65	0.06	231.69	94.78	1.5	0.85	5.5	2	----	C	0.894636
FROME	EAST BURTON (95**)	19950524	1.94	0.04	234.35	107.64	----	2.58	5.5	----	----	C	0.894636
AIRE	U/S CONONLEY BECK	19950926	1.86	0.16	177	80.32	1	2.27	1.46	1	15	B	0.896078
BARLOW BROOK	SHEEPBRIDGE	19951025	2.33	0.14	163.5	83.67	1	1	1.42	4.29	9.8	B	0.896078
TINKER BROOK	PTC WHITE ASH BROOK	19951011	2.21	0.3	205.33	97.01	1	29.85	5.71	1.84	1038	C	0.898785
MIDFORD BROOK	MIDFORD BROOK M	19950501	1.78	0.07	315.75	94.08	2.14	4.14	5.71	2.14	6.71	C	0.898785
NEWLYN	Skimmel Bridge	19950302	0.78	0.03	40.6	98.55	----	2.5	5	----	----	B	0.9
MYLOR CREEK	Mylor Bridge	19950314	0.93	0.02	78.27	96.39	----	2.5	5	----	----	B	0.9
YEALM	Popple's Bridge	19950405	1.32	0.04	41.89	96.1	----	2.5	5	----	----	B	0.902574
YEALM	u/s Fardel Moor Weir d/s Lake	19950405	0.76	0.02	20.29	97.35	----	2.5	5	----	----	B	0.902574
HEMBAL BROOK	BELOW BLACKPOOL	19951017	0.97	0.54	190.27	94.67	1	70	40	2	----	B	0.904192
BRENT	AT UXBRIDGE ROAD HANWELL	19950405	5.05	0.4	----	70.71	----	1010	58	0.12		B	0.904192
CHEW	30M U/S BRIDGE, CHEW MAGNA	19950426	2.51	0.15	----	89.07	1.5	2.75	5	2	9.5	B	0.90595
LADDEN BROOK	COGMILL FARM	19950310	1.95	0.09	260.09	87.15	----	3.33	5	----	----	B	0.90595
MONKSILVER STREAM	WILLITON (40M U/S A39 ROAD BRIDGE)	19950419	1.22	0.02	157.26	97.92	----	2.5	5	----	----	B	0.907251
DONIFORD STREAM	SWILL BRIDGE (85M D/S)	19950421	1.28	0.02	201.39	96.92	----	2.5	5	----	----	B	0.907251
BOVEY	u/s Arm Of Meander Twinyeo Farm	19950516	2	0.13	31.31	95.58	1	2.5	5	2	----	B	0.908411
BOVEY	u/s Arm Of Meander Twinyeo Farm	19951023	2	0.13	37.74	95.58	1	1.97	5	2	----	B	0.908411
HOOKE	U/S MAIDEN NEWTON (95**)	19950308	1.54	0.07	216.91	102.22	----	2.5	5	----	----	B	0.910543
FROME	BRADFORD PEVERELL STW (95**)	19950501	1.79	0.05	236.93	97.64	----	2.67	5	----	----	B	0.910543
GREAT STOUR	BRETTS	19950330	2.1	0.1	270.69	98.8	1	----	6	----	----	B	0.911111
VINEHALL STREAM	U/S EWWC ABSTRACTION	19950421	1.5	0.04	86.25	81.02	1	----	6	1	----	B	0.911111
HAYLE	B3303 Bridge Crowan	19950303	1.13	0.03	36.69	95.87	----	3.75	5	----	----	B	0.911392
HAYLE	Drym Farm	19950303	1.04	0.02	57.18	97.83	----	3.5	5	----	----	B	0.911392
SAIL BECK	AT NY175170	19950314	1.15	0.02	----	99.05	0.5	0.51	5	0.5	5	C	0.914729
HAWKCOMBE	PORLOCK (12M U/S	19950418	1.05	0.01	35.41	96.27	----	3.33	5	----	----	C	0.914729

			Concentration (mg/l)										
		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
RIVERS BROOK STREAM	BUNGALOW BRIDGE)												
TARSET BURN	REDMIRE	19950921	1.4	0.06	133.75	97	1	1	1	1	16.25	B	0.914934
TYNE (02)	CHOLLERFORD	19950920	1.5	0.02	57.1	92	1	1	1	1	16.25	B	0.914934
WHARFE	RYTHER 1	19950424	2.05	0.1	276.33	91.54	1.23	1.35	1	1.14	20	B	0.915285
URE	ALDWARK TOLL BRIDGE 1	19950928	1.98	0.08	288.33	103.6	1	2.19	1	1.08	8.77	B	0.915285
SUTTON BINGHAM STREAM	U/S SUPPLY STW	19950426	2.03	0.17	188.11	94.08	1.33	2.5	5	2	5	B	0.915921
SUTTON BINGHAM STREAM	U/S SUPPLY STW	19950906	2.03	0.17	182.77	94.08	1	1.98	5	2	----	B	0.915921
HORNER WATER	BOSSINGTON (20M U/S GREEN BRIDGE)	19950418	0.99	0.01	27.13	97	----	2.5	5	----	----	B	0.918544
ALLER RIVER	WEST LYNCH BRIDGE (5M U/S)	19950418	1.59	0.01	146.41	100.64	----	2.67	5	----	----	B	0.918544
OUSE (05)	BARCOMBE MILLS	19951102	2.28	0.1	117.04	90	1	----	8	----	----	B	0.919521
ADUR WEST	BINES BRIDGE	19951102	2.1	0.08	191.6	78.05	1	----	8	2	----	B	0.919521
WHARFE	RYTHER 1	19951019	2.05	0.1	249	91.54	1	2.14	1.78	1.47	16	B	0.920755
TEST	GREATBRIDGE	19950413	1.73	0.05	271.43	97.9	1	----	2	0.5	----	B	0.920755
NORTON SUB HAMDON STREAM	D/S ODCOMBE TIP (D/S FOOTBRIDGE,BAGNELL FARM)	19950914	1.64	0.19	376.75	92.58	1.67	4.23	10	2	----	B	0.921902
TREGILLOWE STREAM	Gwallon	19950302	0.78	0.07	152.36	82.88	----	55	10	----	----	B	0.921902
MERE	300m u/s A386 Br 50m u/s Pylons	19950413	1.46	0.12	54.68	88.52	1	2.5	5	2	----	C	0.922939
WOOLEIGH STREAM	25m d/s B3220 rd br	19950919	1.79	0.05	68.71	95.92	1	2.57	5	2	5	C	0.922939
AXE	25M U/S BRIDGE, LOWER WEARE	19950503	2.46	0.11	342.17	89.43	1.33	2.67	5	2.67	35	B	0.923221
CHEDDAR YEO	10M U/S FOOTBRIDGE, D/S HYTHE STW	19950425	1.69	0.06	255.43	115.36	1	2.5	5	10	55	B	0.923221
CRIMPLE BECK	BLACKSTONES	19950316	4.44	2.25	172.4	77	1	3.84	3.3	1	20	B	0.925134
WEAR	LAMBTON	19950928	3	1.46	342.5	93	1.59	3.47	3.26	1.27	20.4	B	0.925134
PARK BECK (03)	AT NY144205	19950314	1.41	0.02	----	97.43	0.5	0.88	5	0.5	5	B	0.925664
WARNSCALE BECK	AT NY189148	19950314	0.87	0.01	----	92.59	0.5	1.08	5	0.5	15.6	B	0.925664
TONE RIVER	NYNEHEAD (120M D/S HORNSHAY BRIDGE)	19950330	1.73	0.08	77.25	90.23	1	2.83	5	2	6	B	0.925996
TONE RIVER	GREENHAM (60M U/S BRIDGE)	19950323	1.63	0.07	84.46	91.27	----	2.5	5	----	----	B	0.925996
FOSS	STRENSALL	19950502	2.22	0.3	358.67	73.09	1.26	3.23	1.74	1	20	B	0.927856
TARSET BURN	REDMIRE	19950502	1.4	0.06	44	97	1	1.15	1.71	1	20	B	0.927856
FOSS	WEST LILLING	19950502	2.33	0.1	382	128.5	3.23	2.09	1.67	1	20	B	0.929348
BENTLEY BROOK (10)	D/S FLOCKTON	19951026	1.64	0.08	310.73	90.75	1	1.16	1.67	1	7.5	B	0.929348
STOUR	BLACKWATER JUNCTION (91**)	19950516	3.11	0.06	243.26	100.75	----	2.5	5	----	----	B	0.930048
ASHFORD WATER	D/S FORDINGBRIDGE (95**)	19951106	1.23	0.04	253.59	96.55	1	2.5	5	2	----	B	0.930048
THRUSHEL	Stowford Bridge (townleigh)	19950411	1.56	0.06	50.44	92.33	----	2.5	5	----	----	C	0.933198
CAREY	Ashmill Bridge	19950413	1.38	0.06	37	92.45	----	2.5	5	----	----	C	0.933198
ALLEN	U/S WALFORD MILL (95**)	19950421	1.58	0.02	273.8	86.58	----	2.5	5	----	----	C	0.933468
ALLEN	D/S WITCHAMPTON BRIDGE (95**)	19950424	1.49	0.02	267.64	100.1	----	2.5	5	----	----	C	0.933468
CAMEL	D/S BODMIN (NANSTALLON) STW	19950914	1.19	0.08	80.64	95.62	1	2.4	5	2	----	C	0.934046
TREGESFAL	TREGESEAL BRIDGE	19950301	0.98	0.05	44.25	99.38	----	5	5	----	----	C	0.934046
BLACKWATER (01)	B1090 RD BDG	19950501	1.55	0.09	386.5	104.06	1	2.7	5	0.5	3	B	0.934615
BLACKWATER (01)	B1090 RD BDG	19951127	1.55	0.09	356	104.06	1	2.8	5	0.5	8	B	0.934615
BLACKBURN BROOK (10)	AT A6109	19950516	2.34	0.37	294.2	78.26	1.12	4.2	19.7	1	44.33	B	0.936455
BEULT	CROSS AT HAND	19951101	2.75	0.09	----	82.44	1.2	----	19.4	2	----	B	0.936455
ERME	500m u/s Sequer's Bridge	19951108	4.3	0.05	59.13	99.28	1	2.58	5	3	7.67	B	0.938433
TORRIDGE	100m d/s Rothern Br	19950405	2.56	0.04	40.39	111.17	1	2.5	5	2	----	B	0.938433
AIRE	APPERLEY BRIDGE	19950920	5.75	0.3	223	83.07	1.73	7.87	8.96	1.16	24	C	0.938856
BENNY STREAM	Trewerry Mill	19950315	0.92	0.22	93.63	95.08	----	3.67	9	----	----	C	0.938856
CAM	QUEEN CAMEL	19950313	1.75	0.09	331.08	95.23	----	2.5	5	----	----	B	0.940217
YEO (09)	BICKNELL'S BRIDGE	19950426	1.66	0.08	283.25	81.21	----	3.17	5	----	----	B	0.940217
HOOKE	HOOKE (95**)	19951127	1.63	0.12	264.39	93.38	1.5	1.65	7.5	2.5	----	B	0.94148
MARDEN	BUCK HILL	19950405	1.86	0.09	313.83	95.11	1.5	2.5	7.5	2	5	B	0.94148
TOM RUDD BECK	40M U.S. LORTON ROAD	19950306	2.06	0.09	----	95.97	0.5	0.6	5	0.5	5.95	B	0.942593
KENSEY	Newport	19950410	1.02	0.03	52.55	96.61	----	2.67	5	----	----	B	0.942593
CHAR	Charmouth (95**)	19950301	2.76	0.25	146.04	94.42	----	4	5	----	----	B	0.943802
BRIT	SKILLING HILL (91**)	19950301	1.96	0.15	197.53	105.99	----	2.5	5	----	----	B	0.943802
FROME	WOOL BRIDGE (91**)	19950524	1.75	0.05	234.83	91.6	----	2.5	6	----	----	C	0.94453
PIDDLE	U/S PUDDLETOWN (95**)	19950320	0.94	0.02	284.29	96.64	----	2.5	6	----	----	C	0.94453
ARUN	WELLCROSS BRIDGE	19951102	3.88	0.25	----	78.43	1.67	----	17.67	2	----	B	0.945902
PIX BROOK	CHURCH END ARLESEY	19950904	2.69	0.12	----	106	1.33	44.57	17.33	2.17	47.33	B	0.945902
TORRIDGE	100m u/s Beam Bridge	19950914	2.63	0.06	56.21	106.05	1	2.6	5.2	2	7	C	0.946886
AVILL TRIBUTARY	TIMBERSCOMBE (D/S GREAT HOUSE FISH FARM)	19951101	1.43	0.04	151.21	97.69	1	1.75	5.25	2	----	C	0.946886
AIRE	APPERLEY BRIDGE	19950502	5.75	0.3	174.78	83.07	2.03	4.49	4.32	1.1	37	B	0.947573
COLNE (07)	AT BUSHEY MILL LANE	19950316	2.44	0.09	270.67	92.18	1.33	9.27	4.33	1.67	15	B	0.947573
COBB'S CROSS STREAM	BELOW MILLWOOD FISH FARM, ANDERSFIELD	19950321	2.37	0.08	208.02	92.1	1	2.5	5	2	5	B	0.949275
COBB'S CROSS STREAM	BELOW MILLWOOD FISH FARM, ANDERSFIELD	19950906	2.37	0.08	219.29	92.1	1.67	1.63	5	2	----	B	0.949275
BEVERLEY BROOK	AT MOTSPUR PARK	19950927	7.06	1.4	244.5	63.12	1	4.5	5	1.45	35	B	0.949799

				Concentration (mg/l)								
RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
MEDWAY	WHILLETS BRIDGE	19950503	2.21	0.17	96.25	82.83	1	----	5	4.1	----	B	0.949799
OZLEWORTH BROOK	BRADLEY GREEN WOTTON STW	19950308	2.23	0.36	304.08	95	1	2.5	5	2	5	B	0.950311
OZLEWORTH BROOK	D/S NIND FISH FARM	19950904	2.05	0.32	321.95	87.71	2	1.4	5	2	----	B	0.950311
CALDER (03)	200M U.S. RAILWAY BRIDGE NEAR SELLAFIELD	19950307	0.95	0.29	----	103.48	1	0.9	5	0.75	5.72	B	0.95057
CALDER (03)	500M U.S. CALDER BRIDGE	19951011	0.8	0.02	61.43	100.39	1.98	0.5	5	0.5	----	B	0.95057
STOUR	HAMMOON (95**)	19950531	2.71	0.15	282.41	91.79	1.5	2.75	5	2	6.5	B	0.951557
STOUR	DURWESTON (95**)	19950531	2.38	0.08	261.29	106.5	1	2.88	5	2	----	B	0.951557
STOGURSEY BROOK	STOLFORD BRIDGE (5M D/S WOOD FOOT BRIDGE)	19950315	2.26	0.11	220.88	93.17	1	6	5	2	10	B	0.95171
CANNINGTON BROOK	CANNINGTON (67M D/S A39 BRIDGE)	19950315	2.4	0.1	165.12	91.29	----	3	5	----	----	B	0.95171
EEA	AT CARTMEL	19950307	1.62	0.09	135.33	88.23	1	1.84	5	0.5	5	C	0.956439
RUSLAND POOL	D/S RUSLAND POOL BRIDGE	19950406	1.33	0.02	38.9	95.45	1	1.08	5	0.5	5	C	0.956439
WEAR	LAMBTON	19950420	3	1.46	175.5	93	7.32	3.39	3.39	5.63	32.53	B	0.956685
NENT	ALSTON	19950412	1.6	0.03	76.97	97	1	2.55	3.63	32.53	989	B	0.956685
MIDFORD BROOK	MIDFORD BROOK M	19950907	1.78	0.07	306	94.08	2.33	5.33	5	2	9.83	B	0.957529
MELLS RIVER	10M U/S BRIDGE, VOBSTER	19950412	1.56	0.06	250.79	99.5	----	2.5	5	----	----	B	0.957529
TONE RIVER	D/S CLATWORTHY RES. (50M D/S GARDENER'S BR.)	19950921	1.62	0.09	40.44	91.8	1	1.88	5	2	----	B	0.958781
TONE RIVER	WASHBATTLE BRIDGE (65M D/S)	19950323	1.45	0.03	42.83	91.73	----	2.63	5	----	----	B	0.958781
NINE MILE RIVER	BULFORD (90**)	19950503	1.23	0.02	227.69	99.36	----	2.5	5	----	----	B	0.959032
TILL (09)	STAPLEFORD (90**)	19950517	1.15	0.02	264.06	110.48	----	2.5	5	----	----	B	0.959032
COLNE (07)	ABOVE THAMES	19950510	2.95	0.15	301.5	87.87	1	10.1	4.45	1.65	17.5	B	0.959381
KENT ROTHER	BLACKWALL BRIDGE	19950531	2.84	0.11	120	99.55	1	----	4.45	1.25	----	B	0.959381
BY BROOK	LONG DEAN	19950320	1.51	0.05	294.55	98.23	----	2.5	5	----	----	B	0.959381
BROADMEAD BROOK	NETTLETON SHRUB	19950320	1.66	0.02	299.68	103.92	----	2.5	5	----	----	B	0.959381
WEY	D/S RADIPOLE (95**)	19950306	1.87	0.1	266.82	99.81	----	3.25	28	----	----	B	0.959416
LITTLE DON	DEEPCAR	19951004	2.04	0.08	90.79	89.83	2.57	10.14	30.4	5.92	40.67	B	0.959416
MONKSILVER STREAM	MONKSILVER (13M U/S ROAD BRIDGE)	19950410	1.13	0.04	75.1	95.75	1	2.5	5	2	5	B	0.960526
MONKSILVER STREAM	MONKSILVER (13M U/S ROAD BRIDGE)	19951009	1.13	0.04	108.63	95.75	1	1.05	5	2	----	B	0.960526
ALHAM	U/S ALFORD HOUSE BRIDGE	19950504	1.65	0.15	321.63	81.08	----	3	7	----	----	B	0.962199
YEO (09)	THORNFORD (15 M D/S FOOTBRIDGE)	19950321	1.94	0.12	329.54	94.15	----	2.5	7	----	----	B	0.962199
NIDD	SKIP BRIDGE	19950511	2.13	0.09	140	94.12	1	2.44	1.64	2.11	21	B	0.962825
OUSE BURN	JESMOND DENE	19951129	2.3	0.05	224	95	1	3.68	1.64	1.27	9	B	0.962825
AIRE	SNAITH 1	19951004	3.9	1.03	----	70.54	2.49	18.6	16.05	1.07	32	B	0.964164
CEFNI	A5 ROAD BRIDGE	19950419	3.15	0.19	143.6	102.3	1	5.57	15.33	2	4.33	B	0.964164
DERWENT (02)	RUFFSIDE	19951109	1.1	0.05	81.05	97	1	1.02	1.19	3.84	96.6	B	0.964727
TYNE (02)	CHOLLERFORD	19950503	1.5	0.02	65.3	92	1	1.22	1.2	1	20	B	0.964727
HORSE EYE SEWER	D/S HAILSHAM SOUTH NEW STW	19950926	2.17	2.24	----	63.38	1.5	----	7.25	3	----	B	0.964981
DITTON BROOK	CART BRIDGE LANE HALEWOOD GREEN	19951123	8.61	1.94	168.14	60.7	1.04	18.83	7.06	1.98	29.85	B	0.964981
YEO (BARNSTAPLE)	50m u/s Riversmead Bridge	19950313	1.45	0.04	53.09	100.14	1	2.5	5	2	6.25	B	0.965451
TAW	Chapelton 200m u/s ft br	19950905	2.31	0.03	63.61	104.67	1	2.58	5	2	5.17	B	0.965451
CALDER (10)	MIRFIELD	19950906	8.6	2.14	204	88.45	10.12	7.46	6.29	1.93	30.5	B	0.965732
BRISTOL FROME	OLDBURY COURT	19950310	1.79	0.07	288.97	95.08	----	3.33	6.33	----	----	B	0.965732
STANBRIDGE STREAM	50M D/S PETERSFIELD STW	19951107	2.94	1.02	----	82.99	1.33	----	7.67	2	----	B	0.965753
PAR BROOK	PARBROOK BRIDGE	19951026	4.53	0.43	----	68.64	1.5	----	7.75	3	----	B	0.965753
OUSE (10)	ACASTER MALBIS 1	19951010	2.29	0.5	286.46	86.93	1	2.37	1.16	1.51	11.79	B	0.966252
DASH BECK	AT NY216310	19950310	1.44	0.04	16.2	98.29	0.5	1.42	1.13	0.5	11.1	B	0.966252
AIRE	CASTLEFORD	19950411	5.02	1.49	161.67	77.28	3.53	3.97	4.64	1.07	27.33	B	0.966601
CEFNI	A5 ROAD BRIDGE	19950913	3.15	0.19	148.25	102.3	1.07	10.08	4.67	2	12	B	0.966601
PARRETT RIVER	CHISELBOROUGH HOUSE (10M D/S BYME BRIDGE)	19950509	2.49	0.14	306.24	87.87	----	2.5	5	----	----	B	0.968284
PARRETT RIVER	THORNEY (15M U/S ROAD BRIDGE, 150M D/S WEIR)	19950505	1.98	0.08	313.98	101.54	----	2.5	5	----	----	B	0.968284
SWALE	THORNTON BRIDGE 1	19950531	1.93	0.1	251.5	99.17	1	2.08	1	2.11	20	B	0.968379
SWALE	THORNTON BRIDGE 1	19950915	1.93	0.1	304.25	99.17	1	2.25	1	2.06	16.5	B	0.968379
NIDD	KNARESBOROUGH	19950912	1.96	0.16	108.67	98.55	1	1.94	1.31	1.63	16.67	B	0.974122
DERWENT (02)	ALLENFORD	19951109	1.3	0.05	69.8	98	1	1.18	1.31	1.63	17.6	B	0.974122
WELLAND	CROWLAND BRIDGE	19951004	1.95	0.11	348.83	116.64	1	3.1	5	0.5	11	B	0.974359
BURE	D/S HORSTEAD MILL	19950515	1.19	0.04	338.8	98.51	1	1.6	5	0.5	2	B	0.974359
HICK'S MILL STREAM	Hick's Mill	19951019	1.26	0.27	59.97	96.13	----	132.5	9.54	2		B	0.977456
CARNON	Twelveheads	19950322	0.95	0.03	72.32	95.51	----	160.71	9.64	2	923.	B	0.977456
WISKE	YAFFORTH	19950302	2.09	0.12	347	76.4	1.23	4.04	2.77	1	20	B	0.9783
DON (10)	DUNFORD BRIDGE	19951013	1.45	0.07	32.87	91.88	1	1.36	2.79	1	15.33	B	0.9783
HUCKLES BROOK	HUCKLES BROOK FARM (90**)	19950418	1.72	0.14	30.54	88.88	----	2.5	5	----	----	B	0.979817
HAMPSHIRE AVON	AVON CAUSEWAY (90**) 1	19950530	1.94	0.04	245.7	97.48	2	2.5	5	2	5	B	0.979817
AXE (06)	300m u/s Whitford Bridge	19950420	1.82	0.08	151.9	104.49	1.14	2.93	5	2	5.43	B	0.983019
OTTER	50m u/s ft br Dotton Mill	19950424	1.83	0.05	136.5	105.75	1.17	2.83	5	2	5.83	B	0.983019
DEER	Rydon Bridge	19950418	3.13	0.3	48.49	92.28	----	3.38	5	----	----	B	0.983051
SMALL BROOK	Headon Bridge	19950418	2.12	0.12	43.5	87.91	----	2.5	5	----	----	B	0.983051
LYDDEN	U/S BAGBER BRIDGE	19950327	2.04	0.22	204.93	80.72	----	3	5	----	----	B	0.984772

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
	(95**)												
LYDDEN	D/S TWOFORDS BRIDGE (95**)	19950327	2.71	0.07	198.29	89.57	----	3.25	5	----	----	B	0.984772
AIRE	SNAITH 1	19950404	3.9	1.03	----	70.54	3.48	6.24	5.69	1.04	28	B	0.985685
BOYD	BITTON U/S ROAD BRIDGE	19950313	1.7	0.08	297.05	95.39	----	2.67	5.67	----	----	B	0.985685
ROTHER	CANKLOW	19950516	4.47	2.41	308.08	77.96	1.39	5.48	10.79	1.03	21.17	B	0.986667
AIRE	D/S HICKSON & WELCH	19951127	5.52	0.89	216.33	68.5	7.24	7.1	10.43	1.98	39	B	0.986667
FAL	BELOW MELBUR PLANT LEAT CP31	19951016	0.91	0.09	57.74	97.35	1	6.73	8.67	2	----	B	0.991468
EASTLOOE	BELOW MOORSWATER	19951010	2.62	0.04	302.27	92.83	1	2.3	8.67	2	----	B	0.991468
TREVERBYN STREAM	BELOW INNIS MOOR MICA DAM	19951012	0.93	0.08	38.78	86.64	1	1.05	5	2	----	B	0.992236
GWINDRA STREAM	BELOW CURRIAN CP	19951013	0.5	0.05	32.38	89.24	1	1.73	5	2	----	B	0.992236
ADUR EAST	WORTLEFORD BRIDGE	19950526	2.74	0.15	----	83.71	1.33	----	4.33	1.5	----	A	0.996205
NEW BEDFORD / HUNDRED FT R	EARITH BR 1	19951115	2.79	0.08	331.2	107.32	1.14	5.79	4.43	0.46	10.17	A	0.996205
LOW MOOR BECK	D/S NEW TIP SITE	19950316	41.63	3.61	188	79.73	2.59	5.49	7.87	1.66	57	A	0.996587
CERNEY WICK BROOK	AT SPINE ROAD, SOUTH CERNEY	19951121	3.46	2.03	304	75.18	1	2.9	8	4.7	26	A	0.996587
OUSE (10)	ACASTER MALBIS 1	19950531	2.29	0.5	205	86.93	1.02	1.76	1.07	2.04	20	A	1
SOUTH TYNE	ALSTON	19951010	1.5	0.02	131.7	98	1.04	1.34	1.08	3.95	49	A	1
ERME	500m u/s Sequer's Bridge	19950523	4.3	0.05	60.91	99.28	1	2.5	5	2.2	5.8	A	1.00365
AVON (06)	150m u/s Hatch Bridge 500m d/s New Bridge	19951102	1.34	0.02	74.8	100.03	1	2.5	5	2	7.2	A	1.00365
WELLOW BROOK	D/S WELLOW STW	19950501	2.75	0.14	321.64	94.58	----	4	5	----	----	A	1.003883
CAM BROOK	U/S VIADUCT	19950501	1.91	0.11	325.25	95.15	----	2.75	5	----	----	A	1.003883
GREAT STOUR	LONGPORT BRIDGE	19951016	2.18	0.2	----	93.24	1.67	----	21.67	2	----	B	1.00624
REDRUTH STREAM	BELOW OLD CONCORD MINERALS	19951020	0.71	0.02	70.5	98.58	1	66.67	20	2	----	B	1.00624
IVEL	A600 RB LANGFORD	19950321	2.33	0.18	----	107	1.5	8.05	7	0.55	12.5	A	1.00625
WELLAND	CROWLAND BRIDGE	19950404	1.95	0.11	364.86	116.64	1	2.5	7	2	5	A	1.00625
TONE RIVER	D/S CLATWORTHY RES. (50M D/S GARDENER'S BR.)	19950323	1.62	0.09	35.88	91.8	1	2.5	5	2	5.25	A	1.006838
KILVE STREAM	RECTORY BRIDGE (25M D/S WEIR)	19950421	1.18	0.02	136.7	93.31	----	2.5	5	----	----	A	1.006838
INGREBOURNE	A13 ROAD BRIDGE	19951121	1.51	0.42	318	79.58	1	10	9.33	1.93	37.67	A	1.007886
TEST	LONGSTOCK	19951019	1.74	0.04	259.5	102.99	1.5	----	9.5	2	----	A	1.007886
ANCHOLME	NEW RIVER ANCHOLME HORKSTOW BRIDGE	19950320	3.1	0.14	527.43	122.43	----	2.6	18	----	----	A	1.009231
PIX BROOK	CHURCH END ARLESEY	19950323	2.69	0.12	----	106	2	23.7	18	1.7	32.5	A	1.009231
WORTH	KEIGHLEY GARFORTH ROAD	19950919	2.47	0.2	81.9	86.88	1.61	2.96	1.25	1.34	16.67	A	1.012681
COSTA BECK	KIRBY MISPERTON	19950405	1.56	0.09	252.73	99.5	1	1.35	1.29	1	20	A	1.012681
TAW	Chapelton 200m u/s ft br	19950413	2.31	0.03	49.72	104.67	1	2.5	5	2	5	A	1.013035
NORTH RADWORTHY	25m d/s Barham Bridge	19950911	0.72	0.01	38.64	101.19	1	2.5	5	2	5	A	1.013035
WYLYE	HENSFORD MARSH (93**)	19950510	1.7	0.24	285.29	105	1	2.5	5	2	5	A	1.014975
WYLYE	D/S QUIDHAMPTON (95**)	19950514	1.37	0.02	263.02	110.57	----	2.5	5	----	----	A	1.014975
CERNEY WICK BROOK	AT SPINE ROAD, SOUTH CERNEY	19950530	3.46	2.03	303.33	75.18	1	2.53	6.67	1.77	15.33	A	1.018519
DERWENT (02)	CLKBN DRF	19950523	2	0.07	222	105	1.25	2.69	6.64	1.18	21	A	1.018519
MEDWAY	U/S ALLINGTON SLUICES	19951103	2.96	0.1	204.12	97.51	1	----	13	2	----	A	1.021417
EDEN (05)	DELAWARE FARM	19951106	2.52	0.09	----	91.18	1.14	----	12.71	2	----	A	1.021417
LEE (07)	AT WATERHALL	19950329	1.15	0.12	295	95.08	3.03	5.45	6.13	0.67	17.73	A	1.02144
TADNOLL BROOK	MOIGNE COMBE (95**)	19950410	1.62	0.1	234.38	96.52	----	2.5	6	----	----	A	1.02144
HAMPSHIRE AVON	PETERSFINGER (95**)	19950522	1.99	0.03	268.83	104	1.5	2.5	5	2	5	A	1.021773
HAMPSHIRE AVON	D/S SALISBURY (95**)	19950517	2.24	0.03	274.59	97.74	----	2.5	5	----	----	A	1.021773
WOTTER BROOK	BELOW CP38/6	19950925	0.97	0.06	36.96	102.33	1	4.4	6.33	2	----	A	1.022654
PIDDLE	PIDDLEHINTON (91**)	19950320	1.59	0.03	284.02	99.65	----	2.5	6.33	----	----	A	1.022654
FOSS	STRENSALL	19951031	2.22	0.3	328.33	73.09	1	3.94	1.59	1	11.67	A	1.024779
OUSE BURN	JESMOND DENE	19950522	2.3	0.05	379	95	1	3.44	1.61	1	20	A	1.024779
HAMPSHIRE AVON	HALEPARK	19950522	2.4	0.1	266.11	90.94	2.5	2.5	5	2	5	A	1.025765
HAMPSHIRE AVON	LONGFORD CASTLE (95**)	19950522	1.86	0.03	258.2	97.46	----	2.5	5	----	----	A	1.025765
DIBB	HARTLINGTON BRIDGE	19950314	1.33	0.04	79.43	102.7	1	1.03	1.06	4.17	20	A	1.026217
SOUTH TYNE	ALSTON	19950412	1.5	0.02	55.65	98	1.84	1.87	1.07	8.22	44	A	1.026217
AIRE	CALVERLEY BRIDGE	19950502	4.97	0.29	169	76.13	1.89	4.56	3.72	1.68	23.25	A	1.02669
WEAR	SHINCLIFFE	19950928	2.1	0.24	356.67	86	1	2.6	3.67	1.02	15	A	1.02669
PORTHTOWAN STREAM	Porthtowan Bridge	19950306	1.01	0.55	103.69	85.79	----	195	20	----	1350	A	1.027113
ALLEN (06)	Knightsmill Bridge	19950331	1.37	0.02	77.17	94.85	----	2.5	20	----	----	A	1.027113
LEW	Combebow Bridge	19950413	1.5	0.05	45.78	95.32	----	2.5	5	----	----	B	1.027132
CALDER (03)	500M U.S. CALDER BRIDGE	19950307	0.8	0.02	17.67	100.39	1	0.62	5	0.5	----	B	1.027132
HAMPSHIRE AVON	RINGWOOD (95**)	19950531	1.63	0.05	245.54	97.15	----	2.5	5	----	----	A	1.028169
STANNON STREAM	BELOW STANNON CHINA CLAY	19950915	1.14	0.03	19.01	98.98	1	1.57	5	2	----	A	1.028169
KEWARD BROOK	25M U/S CONFLUENCE R.SHEPPEY, COXLEY	19950504	4.21	0.33	295.4	63.62	3.5	8	5	2	90	A	1.02907
BRUE	50M U/S COW BRIDGE	19950324	2.17	0.17	277.99	94.08	----	2.83	5	----	----	A	1.02907
LYD	Greenlanes Bridge	19950411	1.17	0.06	45.35	97.03	----	2.67	5	----	----	A	1.029091
QUITHER BROOK	prior to River Lyd	19950410	1.28	0.02	50.55	98.48	----	2.5	5	----	----	A	1.029091
TONE RIVER	BATHPOOL (20M U/S TRACK BRIDGE)	19950331	2.29	0.13	198.45	92.18	----	2.83	5	----	----	A	1.029644
BACK STREAM	FITZROY (25M U/S	19950329	1.53	0.07	204.12	93.58	----	2.63	5	----	----	A	1.029644

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
	ROAD BRIDGE)												
CEFNI	U/S CEINT	19950913	5.13	0.29	133.67	95.9	0.93	9.88	4	2	13	A	1.031008
TEST	LONGSTOCK	19950413	1.74	0.04	281	102.99	1	----	4	0.5	----	A	1.031008
CALDER (10)	MIRFIELD	19950428	8.6	2.14	97.18	88.45	7.85	4.88	5.05	1.32	24.5	A	1.031189
HYNDBURN BROOK	PTC RIVER HYNDBURN	19950324	2.47	0.4	130.5	90.44	1.8	10.48	5.09	1.29	345.25	A	1.031189
KENNET (07)	ABOVE THAMES	19950426	2.64	0.09	274	92.75	1	3.1	5	1.3	10.67	A	1.031189
KENNET (07)	ABOVE THAMES	19950915	2.64	0.09	295	92.75	2.33	5.8	5	0.97	23.33	A	1.031189
YEO (09)	OVERCOMPTON MILL	19950426	3.55	0.27	260.22	88.75	2.75	2.88	6.75	2	6.5	A	1.03125
BRADLEY BROOK	PYE CORNER	19950310	2.22	0.07	330.9	90.08	----	3.33	6.67	----	----	A	1.03125
HORSE EYE SEWER	D/S HAILSHAM SOUTH NEW STW	19950516	2.17	2.24	----	63.38	1	----	5	2.13	----	A	1.034615
OUSE (05)	BARCOMBE MILLS	19950505	2.28	0.1	110.78	90	1	----	5	----	----	A	1.034615
EDEN (05)	PENSHURST CLAPPERS SLUICE	19950407	3.12	0.1	140	87.43	1	----	5	0.5	----	A	1.035785
TEISE	SMALLBRIDGE	19950510	1.63	0.06	88.03	98.48	1	----	5	2	----	A	1.035785
TRAPHOLE STREAM	TRAPHOLE TROUT PONDS (15M U/S ROAD BRIDGE)	19950419	1.32	0.02	117.93	94	1	2.5	5	2	----	A	1.036364
TRAPHOLE STREAM	TRAPHOLE TROUT PONDS (15M U/S ROAD BRIDGE)	19951009	1.32	0.02	132.18	94	3.33	1.23	5	3.33	----	A	1.036364
EXE	100m d/s br Thorverton	19951013	1.7	0.04	64.57	100.38	1	2.5	5	2	7.5	A	1.037879
BATHERM	500m u/s rd br Bowbier Hill Under Pylons	19950501	1.41	0.03	88.84	97.67	1	2.5	5	2	5	A	1.037879
DITTON BROOK	CART BRIDGE LANE HALEWOOD GREEN	19950404	8.61	1.94	235.5	60.7	1.31	12.45	6.35	0.65	21.83	A	1.038156
PIX BROOK	RESERVOIR OUTLET LETCHWORTH	19950323	3.63	0.22	----	119.95	2.6	6.2	6.5	3.05	38.5	A	1.038156
WALLERS HAVEN	BOREHAM BRIDGE	19951115	1.5	0.07	87.37	82.24	1	----	5	2	----	A	1.038229
VINEHALL STREAM	U/S EWWC ABSTRACTION	19951031	1.5	0.04	74.15	81.02	1	----	5	2	----	A	1.038229
KENSEY	Truscott Bridge	19950410	0.86	0.04	46.88	94.45	----	3	5	----	----	A	1.038938
PLYM	Cadover Bridge	19950920	0.78	0.01	7.3	100.29	1	1.47	5	2	----	A	1.038938
BENTLEY BROOK (10)	D/S FLOCKTON	19950427	1.64	0.08	374	90.75	1	3.64	14.18	1	20.25	A	1.04
TEST	GREATBRIDGE	19951019	1.73	0.05	258.5	97.9	1	----	14	2	----	A	1.04
SOMERSET FROME	IMMEDIATELY D/S NEW BRIDGE, SPRING GARDENS	19950404	3.01	0.26	161.78	97.36	1	3	5	2	7.5	A	1.042146
NUNNEY BROOK	50M U/S BR, VALLIS	19950412	1.98	0.22	265.66	93.92	----	2.83	5	----	----	A	1.042146
BRUNSOW BECK	AT NY072406	19950403	2.45	0.96	129.67	86.69	2	1.62	1.16	2.5	5	A	1.042254
WEAR	WOLSINGHAM	19951023	1.4	0.04	160.33	102	1	1.6	1.18	1.81	19.53	A	1.042254
KEY BROOK	U/S WEST ORCHARD (95**)	19950329	3.22	1.01	205.47	50.47	----	5.25	6.25	----	----	A	1.043077
SEMINGTON BROOK	LITTLETON PANELL	19950915	1.48	0.1	308.55	92.4	2	2.3	6.25	2	----	A	1.043077
CONGRESBURY YEO	U/S A370 ROAD BRIDGE, CONGRESBURY	19950503	1.72	0.15	343.8	95.69	----	2.5	5	----	----	A	1.044316
LAND YEO	25M U/S BRIDGE, STONE-EDGE-BATCH	19950419	1.91	0.05	357.4	113.46	----	2.5	5	----	----	A	1.044316
CHERWELL	AT MARSTON ROAD, OXFORD	19950425	2.49	0.2	312.5	92.5	1	3.65	5	1.25	5	A	1.045455
GWINDRA STREAM	BELOW DRINNICK	19951013	0.97	0.1	39.73	93.84	1	3.67	5	2	----	A	1.045455
THAME	AT DORCHESTER BRIDGE	19950524	1.83	0.07	360.75	88.02	1.25	4.2	4.83	0.68	7.25	A	1.045455
DUBBERS STREAM	BELOW DUBBERS 11/4	19951013	0.5	0.03	39.15	96.93	1	2.03	5	2	----	A	1.045455
BLUMER BECK	PTC R. DERWENT	19950310	2	0.03	59.87	104.53	0.65	0.86	0.5	0.5	6.78	A	1.046939
NEWLANDS BECK	D.S. COLEDALE B. CONFL.	19950306	1.07	0.03	8.81	98.15	0.5	0.7	0.86	5.17	59.7	A	1.046939
STOUR (09)	LONGHAM (90**)	19950529	2.77	0.11	274.19	92.82	----	3	5	----	----	A	1.048356
HAMPSHIRE AVON	FORDINGBRIDGE (90**)	19950522	2.2	0.07	270.69	89.84	----	3.13	5	----	----	A	1.048356
LOWER WITHAM	LANGRICK BRIDGE 1	19950912	3.53	0.16	456.6	135.57	1	2.9	5	0.5	2	A	1.04878
YEO (BARNSTAPLE)	50m u/s Riversmead Bridge	19950906	1.45	0.04	76.61	100.14	1	2.5	5	2	6.25	A	1.04878
COBB'S CROSS STREAM	GOATHURST (25M D/S GABLES BRIDGE)	19950321	2.3	0.32	208.18	72.7	1	2.5	5	2	5	A	1.049632
COBB'S CROSS STREAM	GOATHURST (25M D/S GABLES BRIDGE)	19950906	2.3	0.32	209.36	72.7	1.33	1.83	5	2	----	A	1.049632
DERWENT (10)	LOW HUTTON	19950516	1.53	0.15	265.5	90.73	1.01	1	1	1	20	A	1.05029
COSTA BECK	KIRBY MISPERTON	19951026	1.56	0.09	257.33	99.5	1	1	1	1	8.33	A	1.05029
CHEW	100M D/S OF BRIDGE, PUBLOW	19950428	2.11	0.08	291.48	93.58	----	2.5	5	----	----	A	1.050388
WINFORD BROOK	60M D/S BRIDGE, CHEW MAGNA	19950426	1.84	0.05	275.65	99.58	----	2.75	5	----	----	A	1.050388
EASTERN AVON	U/S SCALES BRIDGE (95**)	19950425	1.7	0.1	289.68	101.71	----	2.5	5	----	----	A	1.051071
BOURNE	LAVERSTOCK (95**)	19950514	1.27	0.02	256.13	107.45	----	2.5	5	----	----	A	1.051071
SHEPPEY	IMMED D/S RED FT BR, U/S RD BR, LOWER GODNEY	19950322	2.14	0.17	312.53	83.64	----	2.83	5	----	----	A	1.052738
AXE	IMMEDIATELY U/S BRIDGE, HENLEY	19950411	1.39	0.1	270.25	100.86	----	2.5	5	----	----	A	1.052738
MOLE (07)	ABOVE THAMES	19950502	2.35	0.4	212.33	96.68	2	3.87	7	0.73	13.67	A	1.055932
DERWENT (02)	LINTZFORD	19951122	1.9	0.05	236	92	1	2.85	6.99	1	16.25	A	1.055932
LEVY (DRAGLEY) BECK	U/S LOW MILL BRIDGE	19950407	1.9	0.09	93.67	92.5	1	2.28	5	0.5	5	A	1.056673
POAKA BECK	U/S WTP DISCHARGE	19950426	2.6	0.06	64.63	85.82	5.55	1.09	5	2.26	7.7	A	1.056673
SOMERSET FROME	20M U/S BULL'S BRIDGE	19950405	2.73	0.26	118.53	86.18	----	3	5	----	----	A	1.057034
WHATLEY BROOK	100M U/S BR, MURDER COMBE (D/S WHATLEY QUARRY	19950412	0.97	0.02	249.53	100.36	----	3.67	5	----	----	A	1.057034

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
IVEL	A600 RB LANGFORD	19950918	2.33	0.18	----	107	2.33	10.3	13	0.77	14.33	A	1.057239
CARNON	Twelveheads	19951019	0.95	0.03	70.53	95.51	----	50.63	13.85	2	689.23	A	1.057239
DOCKENS WATER	BLASHFORD (90**)	19950418	0.93	0.08	67.72	89.6	----	2.5	6.67	----	----	A	1.061824
BATHERM	500m u/s rd br Bowbier Hill Under Pylons	19951010	1.41	0.03	149.29	97.67	1	2.5	6.67	2	7.67	A	1.061824
CULM	350m d/s br d/s Silverton Mill	19951017	2.38	0.11	165.51	94.92	1	3.5	6.5	2	9	A	1.062264
AXE (06)	300m u/s Whitford Bridge	19951003	1.82	0.08	216.19	104.49	1	2.58	6.5	2	6.33	A	1.062264
ROTHER	CANKLOW	19950908	4.47	2.41	348.9	77.96	1.58	6.58	14.6	1.04	22.81	A	1.06229
BACK BROOK	D/S DIMMER TIP (8M U/S ROAD BRIDGE,LOVINGTON)	19951128	4.13	0.56	429.06	81	1.5	5.05	15	2	----	A	1.06229
NENE	WANSFORD OLD ROAD BRIDGE 1	19950908	2.64	0.09	394.83	100.35	1	8.4	10	0.5	68	A	1.062712
BOLINGEY STREAM	Perranwell	19950315	0.73	0.02	92.11	94.72	----	13	10	----	----	A	1.062712
HICK'S MILL STREAM	Hick's Mill	19950314	1.26	0.27	60.5	96.13	----	115	5	2	507	A	1.063241
BODELLA BROOK	carsella	19951013	6.71	0.05	40.12	85.33	1	4	5	2	----	A	1.063241
MOLE (07)	ABOVE THAMES	19950925	2.35	0.4	237.67	96.68	1.33	3.73	8.67	0.97	15.67	A	1.064407
ROOKHOPE	EASTGATE	19951023	1.2	0.02	191	98	1	5.36	8.53	6.46	205.67	A	1.064407
YEALM	Hele Cross	19950406	0.92	0.17	5.78	97.96	----	2.5	5	----	----	A	1.066914
CULM	350m d/s br d/s Silverton Mill	19950502	2.38	0.11	142	94.92	1	2.75	5	2	9	A	1.066914
BURE	D/S HORSTEAD MILL	19951113	1.19	0.04	305.67	98.51	1	1.3	5	0.5	----	A	1.070896
EXE	100m d/s br Thorverton	19950502	1.7	0.04	53.42	100.38	2	2.5	5	2	5.2	A	1.070896
BOLLIN	WARBURTON MILL HEATLEY	19950322	2.98	0.51	171	89.83	1.62	5.42	5	0.87	13.2	A	1.072993
DEEP MEADOWS BECK	U/S TIDAL DOORS	19950407	1.69	0.09	285.33	94.47	3.05	1.11	5	0.5	5	A	1.072993
DERWENT (02)	EDDYS BR	19950511	1.4	0.05	30.07	95	1.03	1.05	2.27	2.13	27.33	C	1.073022
SOUTH TYNE	HALTWHISTLE	19950926	1.4	0.05	206.5	102	1	1.05	2.44	1	38.2	C	1.073022
MEDWAY	HARTLAKE BRIDGE	19951106	3.24	0.19	145.71	95.8	1	----	8.5	2	----	A	1.073211
TEST	BROADLANDS (LONGBRIDGE)	19951023	1.98	0.07	----	105.22	1	----	8.5	2	----	A	1.073211
COLNE (10)	COLNEBRIDGE	19950428	5.06	0.41	83.44	94.55	5.54	3.54	3.05	1.52	20	A	1.073413
COLNE (10)	COLNEBRIDGE	19950906	5.06	0.41	107.33	94.55	7.71	5.04	3.09	1.6	15	A	1.073413
NOONHOWE SIKE	AT NY548245	19950322	2	0.12	111.33	83.39	1.16	0.82	5	0.5	5	A	1.074906
WENNING	D/S BRIDGE AT HIGH BENTHAM	19950412	1.73	0.03	118.67	103.99	1	1	5	0.5	5	A	1.074906
NORTON SUB HAMDON STREAM	D/S ODCOMBE TIP (D/S FOOTBRIDGE,BAGNELL FARM)	19950425	1.64	0.19	367.43	92.58	1	2.5	7	2	----	A	1.076412
TREVELLAS STREAM	u/s Trevalnance Cove	19950315	0.66	0.01	98.52	98.6	----	20	7	----	----	A	1.076412
BRSITOL AVON	KEYNSHAM D/S WIER U/S ROAD BRIDGE 1	19950906	3.01	0.39	282.57	89.06	1.5	4.42	6.17	4.67	46	A	1.07772
ISLE RIVER	U/S COMBE ST. NICHOLAS S.T.W (7M U/S BRIDGE)	19950920	0.85	0.02	280.17	98.39	1.75	1.73	6.25	2	----	A	1.07772
IWERNE RIVER	STOURPAINE (90**)	19950313	1.87	0.03	306.5	104.27	----	4.75	5	----	----	A	1.07804
SYDLING BROOK	GRIMSTONE (90**)	19950501	1.24	0.02	246.41	109.58	----	2.5	5	----	----	A	1.07804
WORTH	KEIGHLEY GARFORTH ROAD	19950510	2.47	0.2	76.25	86.88	1	2.18	1.66	1.26	20	A	1.084656
DERWENT (02)	ALLENFORD	19950523	1.3	0.05	43.27	98	1	1	1.67	1.94	20.67	A	1.084656
COLNE (07)	ABOVE THAMES	19950921	2.95	0.15	321	87.87	3.67	15.63	5	2.47	25.33	A	1.085603
MIMMSHILL BROOK	AT WATEREND	19950306	3.07	0.09	172.5	98.6	2	25.45	5	2.35	18.5	A	1.085603
DART	25m u/s Totnes Weir	19950517	1.35	0.03	35.89	96.27	1	2.5	5	2	5.83	A	1.089249
DART	10m d/s Dart Bridge Buckfastleigh	19950516	1.46	0.01	23.35	99.33	1	2.5	5	5.5	9.5	A	1.089249
LITTLE AVON	DAMERY/ HUNTINGFORD AT MILL HOTEL	19950308	1.73	0.17	302.14	90.53	1	2.75	5	2	5	A	1.09002
LITTLE AVON	MIDDLE MILL FARM	19950308	1.64	0.06	317.56	92.67	----	2.5	5	----	----	A	1.09002
ADUR WEST	BINES BRIDGE	19950518	2.1	0.08	201.5	78.05	1	----	5	1.25	----	A	1.1
ARUN	PALLINGHAM FOOTBRIDGE	19950505	2.64	0.08	106.5	85.51	1	----	5	2	----	A	1.1
SOMERSET FROME	50M U/S BR, FRESHFORD	19950915	2.32	0.1	256.13	98.55	1.67	2.67	5	2	----	A	1.101145
MELLS RIVER	90M D/S CONFL. BROOKOVER FARM	19950404	1.77	0.09	250.77	101.53	----	2.5	5	----	----	A	1.101145
INGREBOURNE	A13 ROAD BRIDGE	19950307	1.51	0.42	355.67	79.58	1	7.23	6.67	0.53	15.97	A	1.103715
BRISTOL AVON	SALTFORD	19950420	2.5	0.12	288.19	96.14	1	3.5	6.67	2	5	A	1.103715
AIRE	U/S CONONLEY BECK	19950512	1.86	0.16	190	80.32	1	1.9	1.1	1	20	A	1.104762
URE	ALDWARK TOLL BRIDGE 1	19950512	1.98	0.08	185.67	103.6	1	1.3	1.1	2.45	20	A	1.104762
PYESTOCK TRIBUTARY	AT IVELEY ROAD, FARNBOROUGH	19950522	2.21	0.4	187	80.69	2	8.9	8	1.1	44	A	1.105882
LOWER WITHAM	LANGRICK BRIDGE 1	19950413	3.53	0.16	464.5	135.57	1	2.8	8	0.5	5	A	1.105882
KENT ROTHER	BLACKWALL BRIDGE	19951026	2.84	0.11	156.5	99.55	1	----	7	2	----	A	1.111293
CUCKMERE	SHERMAN BRIDGE	19951108	2.73	0.08	121.36	86.23	1	----	7	2	----	A	1.111293
FROME (09)	DORCHESTER (90**)	19950515	1.58	0.04	254.99	105.91	1	2.5	5	2	5	A	1.112811
NADDER RIVER	WILTON (90**)	19950503	1.74	0.04	248.24	103.07	----	2.88	5	----	----	A	1.112811
TEN MILE	DENVER SLUICE 2	19950321	2.74	0.16	575.33	99.3	4.33	6.93	12	0.83	14.67	A	1.114478
LITTLE DON	DEEPCAR	19950420	2.04	0.08	77.98	89.83	1.47	6.65	12.66	3.38	26.33	A	1.114478
EBBLE	BROAD CHALKE (95**)	19950521	1.1	0.05	269.31	97.64	----	2.5	5	----	----	A	1.117541
ASHFORD WATER	D/S FORDINGBRIDGE (95**)	19950419	1.23	0.04	251.32	96.55	----	2.5	5	----	----	A	1.117541
DART	25m u/s Totnes Weir	19951031	1.35	0.03	36.41	96.27	1	2.6	5	2	13.8	A	1.121265
AVON (06)	150m u/s Hatch Bridge 500m d/s New Bridge	19950518	1.34	0.02	67.9	100.03	1	2.5	5	2	5	A	1.121265
NIDD	KNARESBOROUGH	19950511	1.96	0.16	72.13	98.55	1	1.43	1.61	2.54	26.33	A	1.132827
COLEDALE BECK	OPPOSITE CHAPEL WEST OF BRAITHWAITE	19950306	0.96	0.03	7.53	98.9	0.5	0.85	1.63	3.32	137	A	1.132827

RIVERS BROOK		date	BOD	NH_3	Hardness	DO % sat	Cr	Cu	Ni	Pb	Zn	GQA class	ASPT (obs/pred)
			Concentration (mg/l)										
HALL BECK	AT NY531464	19950306	2.2	0.09	85.6	93.5	1	1.08	5	0.5	5	A	1.136784
KING WATER	30M U.S. ROAD BRIDGE AT WALTON	19950320	1.77	0.04	76.2	102.45	1	1.06	5	0.75	23.4	A	1.136784
CAM BROOK	GOOSARD BRIDGE	19950511	2.43	0.16	248.42	90.13	2.5	3.25	5	2	7.5	A	1.148649
CHEW	15M D/S FOOTBRIDGE, KEYNSHAM	19950428	1.98	0.06	285.25	93.58	----	2.5	5	----	----	A	1.148649
MARLEY GAP BK	OUSE, STOCKS BR STIVE	19950504	4.48	0.35	----	94.64	1	16.9	5	1.53	21	A	1.15343
MOLE (06)	50m d/s North Molton Bridge	19950911	2.07	0.19	39.62	93.71	1	3.38	5	2	5	A	1.15343
EDEN (03)	AT TEMPLE SOWERBY 15M U.S. A66 BRIDGE	19950906	1.49	0.05	202.5	96.66	1.27	0.99	5	0.77	5	A	1.166667
BELAH	20M U.S. NEW BRIDGE NEAR KABER	19950323	1.43	0.01	111.33	107.07	1.16	0.82	5	0.5	5	A	1.166667

Annex B Summary of dissolved nickel concentrations with time (1993–2004)

	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
ALFRETON BROOK AT ALFRETON CHESTERFIELD ROAD	12.2	7.1	7.5	6.2	7.3	6.7	5.8	6.0	7.2			
ALFRETON BROOK AT TOADHOLE FURNANCE	7.8	7.8	6.7	5.7	6.6	6.9	6.2	6.4	16.6	5.9	8.4	10.3
ARROW RIVER CASTLE RD STUDLEY							5.4	5.0	7.5	5.5	3.1	
ARROW RIVER LOWER SPERNAL FARM								11.6	17.5	13.0	16.3	
ARROW RIVER SALFORD PRIORS							6.6	8.7	8.5	7.4	3.9	
AVON LOWER EVESHAM		5.7	5.5	5.8	6.3	7.2	12.5	14.4	13.7	9.7	8.5	
BOTTESFORD BECK AT SNAKE PLANTATION					5.1	5.3	6.4	6.6	6.2	6.2	6.2	4.2
EREWASH CANAL AT SHIPLEY GATE	5.0	6.6	5.7	6.3	5.7	6.7	7.5	11.8	7.8	6.2		
HOTON BROOK AT COTES		5.0	5.3	5.0	5.0	4.9	5.0	5.0	5.0			
HUNDRED FOOT RIVER EARITH RD.BR.	5.5	5.0	5.0	5.3	7.3	5.0	6.0	6.5	5.0	5.3	3.3	4.1
KEADBY PUMPING STATION					15.8	17.4	20.9	19.9	15.1	12.6	21.7	22.4
MIDDLE LEVEL MD MULLICOURT PRIORY SLUICE	6.4	5.5	5.0	6.0	15.8	8.5	12.0	5.0	11.0	12.5	10.1	16.3
MOTHER DRAIN AT BALBY CARR					22.1	22.2	20.3	23.7	33.7	24.9	44.3	95.9
MOTHER DRAIN AT ROSSINGTON BRIDGE					11.4	12.4	12.3	16.7	22.1	15.5	25.8	61.5
NON-TIDAL RIVER TRENT - HANFORD	5.0	5.0	5.0	5.6	5.3	5.1	6.0	5.1	5.2	6.5	3.7	3.6
NON-TIDAL RIVER TRENT - TITTENSOR	5.5	5.2	5.1	5.2	5.0	5.1	6.2	5.3	6.2	7.2	5.4	4.5
NON-TIDAL RIVER TRENT - WHIELDON ROAD S-O-T	5.0	5.0	5.0	5.2	5.0	5.0	5.2	5.1	5.1	5.3	3.8	3.7
NON-TIDAL RIVER TRENT WALTON ON TRENT						33.3	39.9	51.9	57.1	41.2	37.7	46.6
NON-TIDAL RIVER TRENT AT GUNTHORPE	11.0	13.2	9.5	10.5	16.2	15.2	19.2	34.9	28.3	24.6	18.9	
NON-TIDAL RIVER TRENT AT NOTTINGHAM TRENT BRIDGE	11.0	12.1	9.7	12.2	14.5	14.3	21.3	27.7	33.2	27.1	18.1	20.9
NON-TIDAL RIVER TRENT YOXALL BRIDGE	5.0	5.5	5.0	5.0	5.0	5.0	5.1	4.9	5.2	6.2	3.8	4.1
NUT BROOK AT CONFLUENCE	5.0	5.0	5.0	5.0	5.0	5.0						

	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
QUENIBOROUGH BROOK AT CONFLUENCE WITH RIVER WREAKE					5.0	5.0	5.0	5.3	6.7	6.6	7.4	
R BOWYDD, TYN Y CEFN BRIDGE 65/1/RS45					8.0	8.2			8.6	8.0		
R SEVERN (LOWER) HAW BRIDGE		5.0	5.0	5.0	5.0	5.0	5.1	5.6	5.4	5.1	3.0	
R.ANCHOLME HORKSTOW BOTTOM	6.6	5.0	5.0	12.9	11.5	10.0	13.5	11.0	12.0	8.5	11.6	21.5
R.BLACKWATER LANGFORD INTAKE	5.0	5.0	5.0	5.0	5.0	5.8	5.5	5.0	5.0	5.0	2.5	4.0
R.BURE HORSTEAD MILL	5.0	6.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	4.5	3.0	3.9
R.CHELMER LANGFORD INTAKE	5.0	5.0	5.0	5.0	5.0	5.5	5.8	5.0	5.0	5.0	2.3	4.2
R.COLNE EAST MILLS INTAKE	5.0	5.0	5.0	5.8	5.0	5.0	5.0	5.0	5.0	5.7	3.1	4.9
R.MEESE AT GREAT BOLAS						5.0	5.0	5.2	5.0	5.0	2.4	
R.NENE WANSFORD OLD RD.BR.	5.0	5.0	5.0	5.5	5.3	5.0	5.5	5.0	6.7	6.8	1.8	5.4
R.SEVERN AT ATCHAM							5.0	5.0	5.0	5.0	1.7	
R.SEVERN SHELTON INTAKE		5.0	5.0	5.0	5.0	5.0	5.0	5.4	5.7	5.0		
R.STOUR AT STOURPORT		6.9	7.2	6.2	5.5	6.7	8.7	8.9	9.7	8.2	8.8	
R.STOUR LANGHAM INTAKE	5.0	5.0	5.0	5.0	6.3	5.0	5.5	5.0	5.0	5.0	3.7	3.7
R.STOUR WIXOE WQMS INTAKE PIER	5.0	5.0	5.0	5.1	7.3	5.0	6.3	5.0	5.0	5.3	3.1	3.9
R.STRINE AT CRUDGINGTON						8.3	7.6	7.0	6.2	7.8	6.6	
R.TEIGL, PONT RHYD Y SARN. 65/1/RS47					6.0	3.0			3.0	3.0	0.8	
R.TEME AT POWICK		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.3	
R.TERN AT ALLSCOTT							5.1	5.2	5.1	5.4	2.7	
R.TERN AT ATCHAM		5.0	5.0	5.0	5.1	5.2	5.0	5.3	5.1	5.3	3.2	
R.TERN AT LONGDON ON TERN							5.0	5.2	5.0	5.2	2.6	
R.TERN AT WATER UPTON							5.0	5.1	5.0	5.3	2.0	
R.WELLAND CROWLAND BR.	5.0	5.0	5.0	5.5	5.0	5.0	5.0	5.0	5.3	5.5	2.3	3.1
R.WELLAND TINWELL PUMPING STATION	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.3	5.0	1.8	3.2
R.WENSUM SWEET BRIAR ROAD BRIDGE	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		1.7	5.3
R.WITHAM LANGRICK BOTTOM	5.0	5.0	5.0	6.3	6.8	5.3	6.3	5.0	5.3	4.5	2.7	8.5
RHEIDOL: PENYBONT BRIDGE			3.0	3.0	3.0	3.0				7.0		
RIVER AMBER AT AMBERGATE	5.3	6.7	6.7				6.1	6.9	9.5		6.4	6.8
RIVER AMBER AT BULLBRIDGE	5.1	6.5	6.3	5.5	5.7	5.4	5.7	5.7	8.3	5.3	6.7	6.9
RIVER AMBER AT SOUTH WINGFIELD	6.7	5.9	5.5	5.4	5.8	5.6	5.9	5.8	11.9	5.7		
RIVER CHURNET - CHEDDLETON STATION	5.3	5.5	5.2	5.2	5.4	5.6	6.3	5.7	6.9	5.3	3.8	4.9

	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
RIVER CHURNET - CONSALL	5.1	5.5	5.2	5.2	5.6	5.6	6.1	5.7	6.6			5.0
RIVER CHURNET - ROCESTER	5.0	5.5	5.1	5.0	5.2	5.1	5.3	5.3	6.2	5.7	3.7	4.7
RIVER CHURNET - WALL BRIDGE LEEK	5.2	5.5	5.3	5.2	5.5	5.7	6.2	5.5				
RIVER DERWENT AT WHATSTANDWELL						5.1	5.0	5.0	5.0	5.0	2.4	2.1
RIVER DERWENT AT WILNE	5.5	5.2	5.0	5.0	6.9	5.1	5.1	5.0	5.3	5.1	3.3	
RIVER DOVE, MONK'S BRIDGE	5.1	5.0	5.0		5.0	5.1	5.3	5.0	5.6	5.0	3.3	2.7
RIVER EREWASH AT JACKSDALE	8.8	8.8	7.7	9.0	10.5	9.3	10.2	10.1	9.7	10.9	8.6	8.0
RIVER EREWASH AT NEW INLET TO ATTENBOROUGH GRAVEL PITS	6.5	7.8	7.7	6.6	9.5	13.5	14.0	22.8	30.2	24.5	21.3	41.2
RIVER EREWASH AT PYEBRIDGE	8.2	8.7	6.9	6.9	10.4	10.6						
RIVER EREWASH AT SHIPLEY GATE	7.4	9.6	7.7	7.8	9.8	19.3	33.9	33.3	63.5	46.0	48.1	30.7
RIVER EREWASH AT TROWELL							27.7	39.9	54.6	37.5	34.1	28.9
RIVER IDLE (MAUN) - AT BAWTRY	5.0	5.0	5.0	5.0	5.1	5.3	5.2	5.0	5.0	5.4	6.3	7.0
RIVER IDLE (MAUN) - AT MISTERTON					5.7	5.9	5.7	6.5	5.4	5.6	8.8	6.9
RIVER IDLE (MAUN) - AT RETFORD			5.0	5.2	5.7	5.3	6.4	4.9	5.1	5.1	4.1	3.9
RIVER IDLE (MAUN) - AT WHINNEY HILL	5.0	5.5	6.3	6.2	9.0	10.6	11.6	5.2	5.2	5.4	2.5	2.9
RIVER SENCE (SOAR) AT CONFLUENCE WITH RIVER SOAR	5.0	7.7	5.5	14.0	6.7	7.8	7.4	17.1	28.9	14.1	12.0	3.5
RIVER SENCE (SOAR) AT WIGSTON				8.4	9.5	8.0	9.4	26.0	47.6		23.4	
RIVER SOAR AT RED HILL LOCK	5.4	5.2	5.0	5.4	5.2	5.2	5.5	5.7	7.8	5.1		
RIVER SOW - MILFORD	5.0	5.0	5.0	5.0	5.0	5.0	5.1	5.1	5.2	3.3		3.2
RIVER TAME - (OLDBURY) DOWNSTREAM UNION RD OLDBURY	5.7	5.2	5.1	5.6	6.0	8.8	7.5	7.1	10.0	21.3		29.5
RIVER TAME - CHETWYND BRIDGE	36.8	42.5	31.1	32.1	52.1	55.8	77.2	95.9	93.1	74.6	73.8	78.6
RIVER TAME - TWO GATES FAZELEY			13.2							81.7	80.8	101.1
RIVER TAME - COTON LANE NETHER WHITACRE										89.8	90.2	108.2
RIVER TAME - ELFORD										73.7	64.8	73.1
RIVER TEAN - CHECKLEY			5.0	5.0	5.0	5.0	5.0	5.4	6.5			1.7
RIVER TEAN - FOLE 'A'			6.2	5.8	6.3	6.3	6.5	7.6	12.5	9.0	5.8	5.7
RIVER TORNE AT AUCKLEY					5.0	6.3	6.5	7.3	9.5	6.4	8.3	12.5
RIVER TORNE AT ROSSINGTON BRIDGE					5.0	6.6	5.7	6.8	7.6	5.9	3.8	4.5
RIVER TRENT (TIDAL) AT KEADBY (EBB TIDE)						16.0	12.6	13.2	14.9	11.7	10.9	13.9

	2004	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
RIVER WREAKE (EYE) - AT KIRBY BELLARS	5.0	5.0	5.0	5.0	5.3	5.3	5.1	4.8	5.0	5.0	2.1	1.9
RIVER WREAKE (EYE) - UPSTREAM OF MELTON SEWAGE TREATMENT WORKS	5.0	5.0	5.0	5.0	5.0	5.0			5.0	5.0	1.8	
ROLLESTON BROOK (ALDER BROOK) - D/S ROLLESTON STW			5.0	5.0	5.0	5.2	5.6	5.1	9.0	5.2		
SAREDON/WYRLEY/WASH BROOK - A449 ROAD BRIDGE, D/S HMIP (SYNTHETIC CHEMICALS)	5.5	6.8	5.4	6.5	10.3	7.3	7.4	6.8	9.9	9.2	8.2	9.0
SOWE RIVER A45 ROAD BRIDGE							5.0	5.1	5.3	5.3	2.4	
SOWE RIVER BAGINTON MILL							8.1	15.9	7.7	5.5	3.5	
TAME VALLEY CANAL HOLLOWAY BANK	16.5	13.0	13.4	18.8			13.8	25.2	48.8			
TEN MILE R. DENVER SLUICE	5.1	5.0	5.0	5.3	7.8	5.0	5.8	5.0	5.5	7.8	3.8	5.7
THAMES AT CAVERSHAM WEIR	5.0	5.0		5.0	5.0	5.0		5.0				
TIDAL TRENT - RIVER TRENT AT DUNHAM	9.3	12.9	10.2	10.2	14.0	15.7	18.2	22.6	25.0	23.2	16.6	18.3
WYRLEY ESSINGTON CANAL SLACKEY LANE GOSCOTE	11.6	13.5	13.6	17.6	15.4	24.2	29.9	16.0	26.0	27.4	29.8	

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