

**ENVIRONMENTAL PROTECTION**



**NRA**

*National Rivers Authority*

*South West Region*

**River Plym Catchment  
River Water Quality  
Classification 1990**

**NOVEMBER 1991**

**WQP/91/011**

**B L MILFORD**

**GORDON H BIELBY BSc**  
**Regional General Manager**

**C V M Davies**  
**Environmental Protection**  
**Manager**

## ACKNOWLEDGEMENTS

The Water Quality Planner acknowledges the substantial contributions made by the following staff:

- R. Broome - Co-ordinator and Editor
- A. Burrows - Production of Maps and editorial support
- P. Grigorey - Production of Maps and editorial support
- B. Steele - Production of Forepage
- C. McCarthy - Administration and report compilation

Special thanks are extended to A. Burghes of Moonsoft, Exeter for computer support and the production of statistical schedules.

The following NRA sections also made valuable contributions:

- Pollution Control
- Field Control and Wardens
- Water Resources

Thanks also to R. Hamilton and J. Murray-Bligh for their contributions.

---

Suggestions for improvements that could be incorporated in the production of the next Classification report would be welcomed.

---

Further enquiries regarding the content of these reports should be addressed to:

Freshwater Scientist,  
National Rivers Authority,  
Manley House,  
Kestrel Way,  
EXETER,  
Devon                      EX2 7LQ

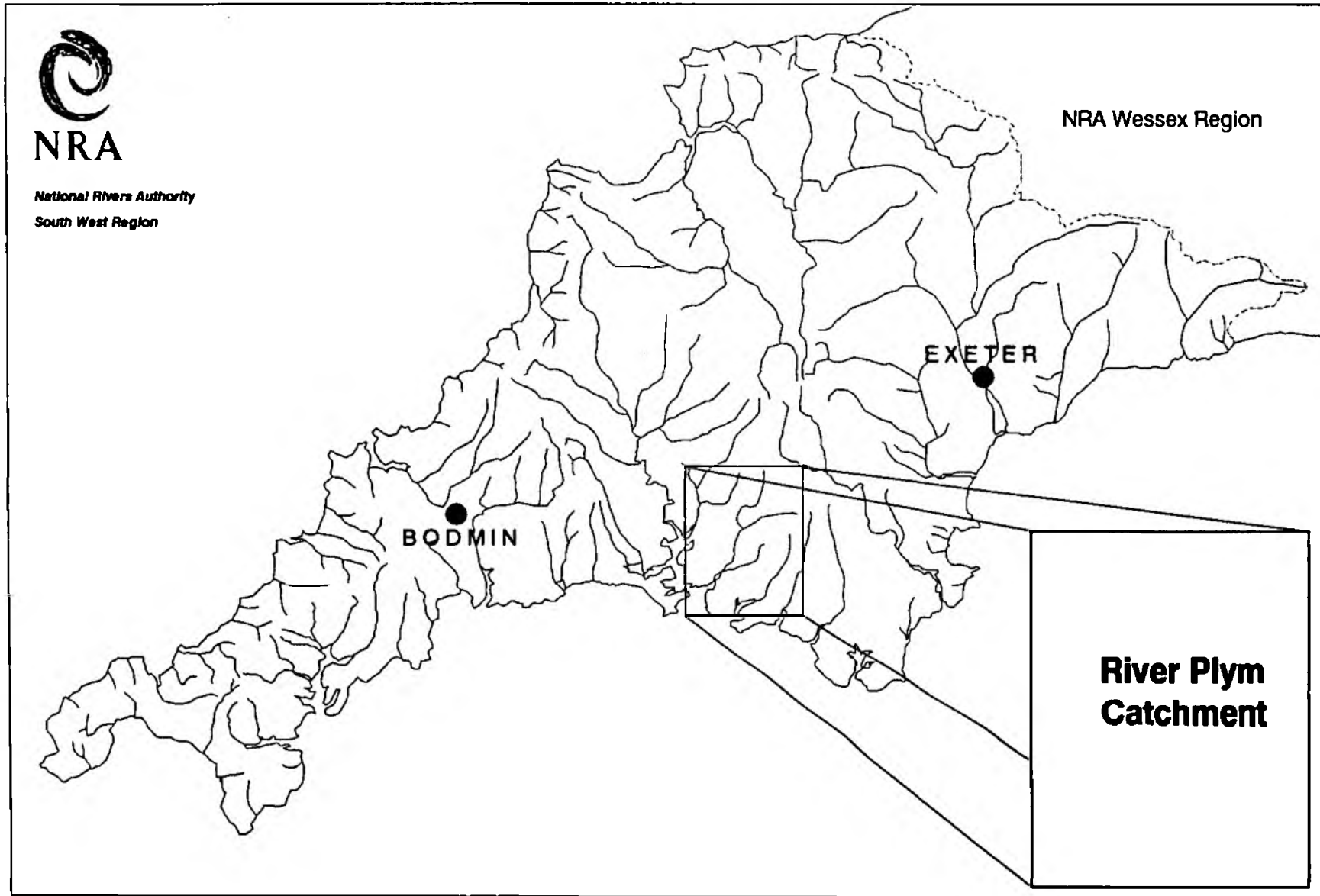


# RIVER WATER QUALITY IN THE RIVER PLYM CATCHMENT

## LIST OF CONTENTS

	Page No.
1 Introduction	1
2 River Plym Catchment	1
3 National Water Council's River Classification System	2
4 1990 River Water Quality Survey	3
5 1990 River Water Quality Classification	3
6 Non-compliance with Quality Objectives	4
7 Causes of Non-compliance	4
8 Glossary of Terms	5
9 References	5
10 Appendices:	
10.1 River Quality Objectives including Monitoring points	
10.2 Basic Determinand Analytical Suite	
10.3 National Water Council (NWC) River Classification System	
10.4 NWC Criteria for Non-Metallic Determinands - Regional Variation	
10.4.1 NWC Criteria for Metallic Determinands - Regional Variation	
10.5 1990 River Water Quality Classification - tabular format	
10.6 1990 River Water Quality Classification - map format	
10.7 Calculated Determinand Statistics used for Quality Assessment	
10.8 Compliant/Non-Compliant River Reaches	
10.9 Number of Samples Results exceeding quality standards	
10.10 Percentage Exceedance of Determinand Statistics from Quality Standard	
10.11 Identification of Possible Causes of Non-Compliance with River Quality Objectives	

# National Rivers Authority South West Region



River Plym Catchment

**River Plym  
Catchment**

## 1. INTRODUCTION

Monitoring to assess the quality of river waters is undertaken in thirty-two catchments within the region. As part of this monitoring programme samples are collected routinely from selected monitoring points at a pre-determined frequency per year, usually twelve spaced at monthly intervals. Each monitoring point provides data for the water quality of a river reach (in kilometres) upstream of the monitoring point.

River lengths have been re-measured and variations exist over those recorded previously.

Each water sample collected from each monitoring point is analysed for a range of chemical and physical constituents or properties known as determinands. The analytical results for each sample are entered into a computer database called the Water Quality Archive.

Selected data are accessed from the Archive so that the quality of each river reach can be determined based on a River Classification System developed by the National Water Council (NWC), (9.1).

This report presents the river water quality classification for 1990 for monitored river reaches in the River Plym catchment.

## 2. RIVER PLYM CATCHMENT

The River Plym flows over a distance of 21.3 km from its source to the tidal limit, (Appendix 10.1). Water quality was monitored at six locations on the main river; four of these sites were monitored at approximately monthly intervals and one site was sampled on twenty occasions because of no recent water quality data. The site at Plym Bridge, which is a National Water Quality monitoring point, was sampled fortnightly.

Throughout the Plym catchment three secondary tributaries of the River Plym were monitored.

In addition Burrator Reservoir was monitored at one location at approximately monthly intervals.

### 2.1 SECONDARY TRIBUTARIES

The Tory Brook flows over a distance of 10.5 km from its source to the confluence with the River Plym, (Appendix 10.1) and was monitored at four sites at approximately monthly intervals. A further one site was sampled on twenty occasions in 1990 because of no recent water quality data.

The River Meavy flows over a distance of 15.1 km and was monitored at approximately monthly intervals at four locations between its source and confluence with the River Plym, (Appendix 10.1).

Blacka Brook flows over a distance of 1.7 km from its source to the confluence with the River Plym, (Appendix 10.1) and was monitored at one location at approximately monthly intervals.

Each sample was analysed for a minimum number of determinands (Appendix 10.2) plus additional determinands based on local knowledge of the catchment. In addition, at selected sites, metal analyses were carried out.

The analytical results from all of these samples have been entered into the Water Quality Archive and can be accessed through the Water Act Register, (9.2).

### 3. NATIONAL WATER COUNCIL'S RIVER CLASSIFICATION SYSTEM

#### 3.1 River Quality Objectives

In 1978 river quality objectives (RQOs) were assigned to all river lengths that were part of the routine monitoring network and to those additional watercourses, which were not part of the routine network, but which received discharges of effluents.

For the majority of watercourses long term objectives were identified based on existing and assumed adequate quality for the long term protection of the watercourse. In a few instances short term objectives were identified but no timetable for the achievement of the associated long term objective was set.

The RQOs currently in use in the River Plym catchment are identified in Appendix 10.1.

#### 3.2 River Quality Classification

River water quality is classified using the National Water Council's (NWC) River Classification System (see Appendix 10.3), which identifies river water quality as being one of five quality classes as shown in Table 1 below:

Table 1 - National Water Council - River Classification System

<u>Class</u>	<u>Description</u>
1A	Good quality
1B	Lesser good quality
2	Fair quality
3	Poor quality
4	Bad quality

Using the NWC system, the classification of river water quality is based on the values of certain determinands as arithmetic means or as 95 percentiles (5 percentiles are used for pH and dissolved oxygen) as indicated in Appendices 10.4.1 and 10.4.2.

The quality classification system incorporates some of the European Inland Fisheries Advisory Commission (EIFAC) criteria (Appendix 10.3) recommended for use by the NWC system.

#### 4. 1990 RIVER WATER QUALITY SURVEY

The 1990 regional classification of river water quality also includes the requirements of the Department of the Environment quinquennial national river quality survey. The objectives for the Department of the Environment 1990 River Quality Survey are given below:

- 1) To carry out a National Classification Survey based on procedures used in the 1985 National Classification Survey, including all regional differences.
- 2) To classify all rivers and canals included in the 1985 National Classification Survey.
- 3) To compare the 1990 Classification with those obtained in 1985.

In addition, those watercourses, which were not part of the 1985 Survey and have been monitored since that date, are included in the 1990 regional classification of river water quality.

#### 5. 1990 RIVER WATER QUALITY CLASSIFICATION

Analytical data collected from monitoring during 1988, 1989 and 1990 were processed through a computerised river water quality classification programme. This resulted in a quality class being assigned to each monitored river reach as indicated in Appendix 10.5.

The quality class for 1990 can be compared against the appropriate River Quality Objective and previous annual quality classes (1985-1989) also based on three years combined data, for each river reach in Appendix 10.5.

The river water classification system used to classify each river length is identical to the system used in 1985 for the Department of the Environment's 1985 River Quality Survey. The determinand classification criteria used to determine the annual quality classes in 1985, subsequent years and for 1990 are indicated in Appendices 10.4 and 10.4.1.

Improvements to this classification system could have been made, particularly in the use of a different suspended solids standard for Class 2 waters. As the National Rivers Authority will be proposing new classification systems to the Secretary of State in the near future, it was decided to classify river lengths in 1990 with the classification used for the 1985-1989 classification period.

The adoption of the revised criteria for suspended solids in Class 2 waters would have affected the classification of the Tory Brook at all sites except Tolchmoor.

The river quality classes for 1990 of monitored river reaches in the catchment are shown in map form in Appendix 10.6.

The calculated determinand statistics for pH, temperature, dissolved oxygen, biochemical oxygen demand (BOD), total ammonia, un-ionised ammonia, suspended solids, copper and zinc from which the quality class was determined for each river reach, are indicated in Appendix 10.7.

## 6. NON-COMPLIANCE WITH QUALITY OBJECTIVES

Those monitored river reaches within the catchment, which do not comply with their assigned (RQO), are shown in map form in Appendix 10.8.

Appendix 10.9 indicates the number of samples analysed for each determinand over the period 1988 to 1990 and the number of sample results per determinand, which exceed the determinand quality standard.

For those non-compliant river reaches in the catchment, the extent of exceedance of the calculated determinand statistic with relevant quality standard (represented as a percentage), is indicated in Appendix 10.10.

## 7. CAUSES OF NON-COMPLIANCE

For those river reaches, which did not comply with their assigned RQOs, the cause of non-compliance (where possible to identify) is indicated in Appendix 10.11.



## 8. GLOSSARY OF TERMS

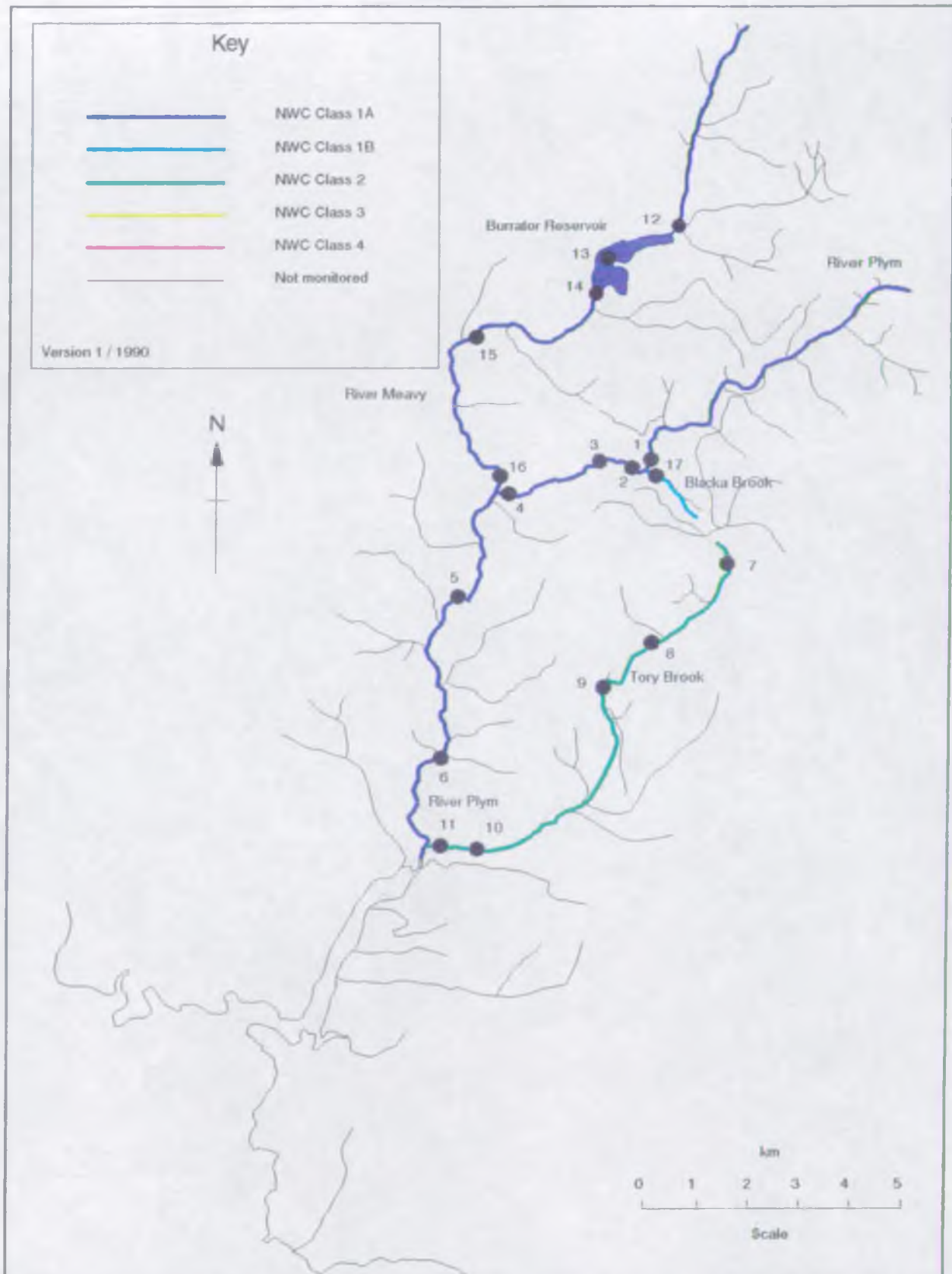
RIVER REACH	A segment of water, upstream from sampling point to the next sampling point.
RIVER LENGTH	River distance in kilometres.
RIVER QUALITY OBJECTIVE	That NWC class, which protects the most sensitive use of the water.
95 percentiles	Maximum limits, which must be met for at least 95% of the time.
5 percentiles	Minimum limits, which must be met for at least 95% of the time.
BIOLOGICAL OXYGEN DEMAND (5 day carbonaceous ATU)	A standard test measuring the microbial uptake of oxygen - an estimate of organic pollution.
pH	A scale of acid to alkali.
UN-IONISED AMMONIA	Fraction of ammonia poisonous to fish, $\text{NH}^3$ .
SUSPENDED SOLIDS	Solids removed by filtration or centrifuge under specific conditions.
USER REFERENCE NUMBER	Reference number allocated to a sampling point.
INFERRED STRETCH	Segment of water, which is not monitored and whose water quality classification is assigned from the monitored reach upstream.

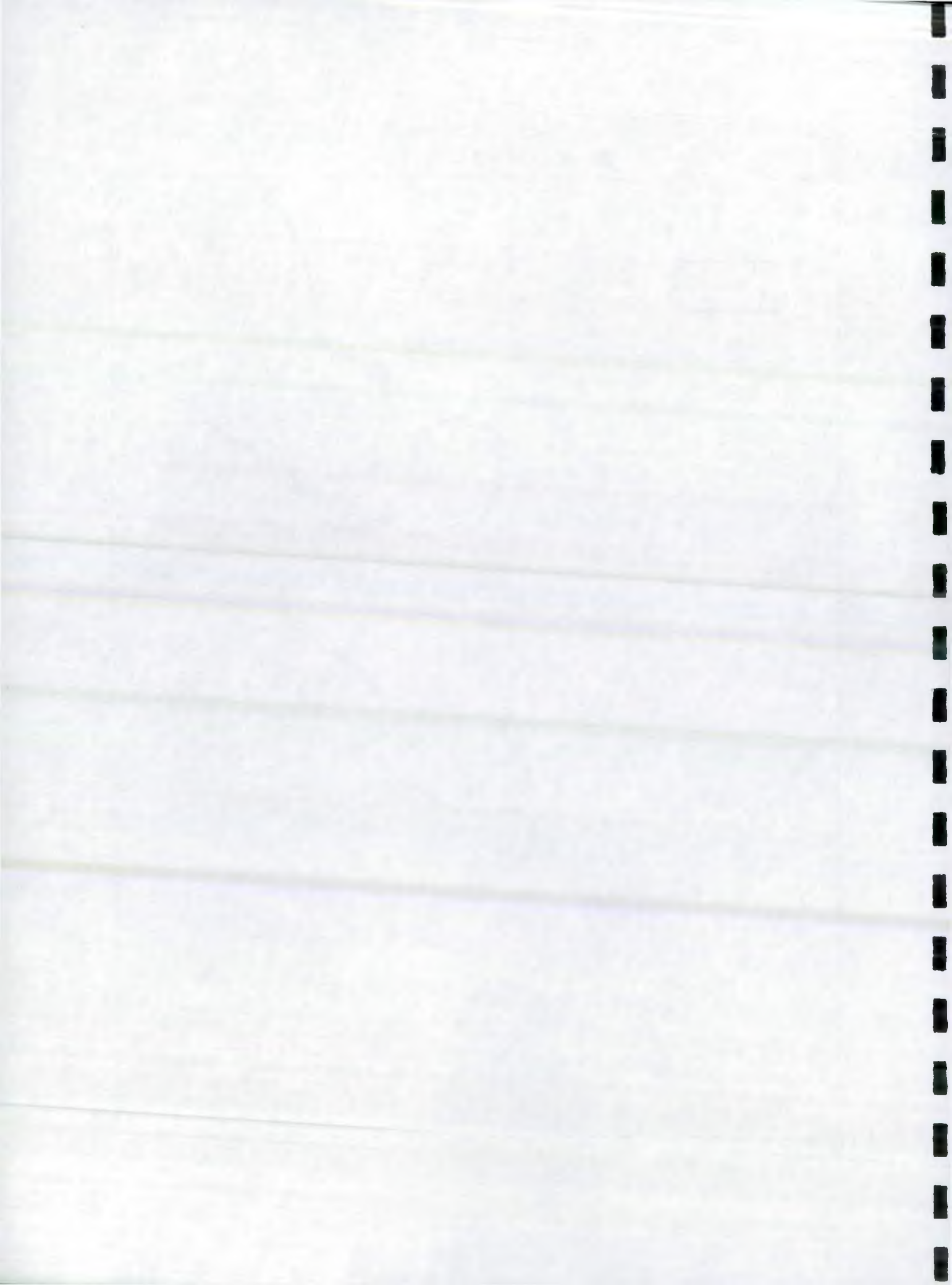
## 9. REFERENCES

### Reference

- 9.1 National Water Council (1977). River Water Quality: The Next Stage. Review of Discharge Consent Conditions. London.
- 9.2 Water Act 1989 Section 117
- 9.3 Alabaster J. S. and Lloyd R. Water Quality Criteria for Freshwater Fish, 2nd edition, 1982. Butterworths.

## Plym Catchment River Quality Objectives





## BASIC DETERMINAND ANALYTICAL SUITE FOR ALL CLASSIFIED RIVER SITES

pH as pH Units  
Conductivity at 20 C as uS/cm  
Water temperature (Cel)  
Oxygen dissolved & saturation  
Oxygen dissolved as mg/l O  
Biochemical oxygen demand (5 day total ATU) as mg/l O  
Total organic carbon as mg/l C  
Nitrogen ammoniacal as mg/l N  
Ammonia un-ionised as mg/l N  
Nitrate as mg/l N  
Nitrite as mg/l N  
Suspended solids at 105 C as mg/l  
Total hardness as mg/l CaCO<sub>3</sub>  
Chloride as mg/l Cl  
Orthophosphate (total) as mg/l P  
Silicate reactive dissolved as mg/l SiO<sub>2</sub>  
Sulphate (dissolved) as mg/l SO<sub>4</sub>  
Sodium (total) as mg/l Na  
Potassium (total) as mg/l K  
Magnesium (total) as mg/l Mg  
Calcium (total) as mg/l Ca  
Alkalinity as pH 4.5 as mg/l CaCO<sub>3</sub>

## MVC RIVER QUALITY CLASSIFICATION SYSTEM

River Class	Quality criteria	Remarks	Current potential uses
	Class limiting criteria (95 percentile)		
1A Good Quality	<ul style="list-style-type: none"> <li>(i) Dissolved oxygen saturation greater than 80%</li> <li>(ii) Biochemical oxygen demand not greater than 3 mg/l</li> <li>(iii) Ammonia not greater than 0.4 mg/l</li> <li>(iv) Where the water is abstracted for drinking water, it complies with requirements for A2* water</li> <li>(v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)</li> </ul>	<ul style="list-style-type: none"> <li>(i) Average BOD probably not greater than 1.5 mg/l</li> <li>(ii) Visible evidence of pollution should be absent</li> </ul>	<ul style="list-style-type: none"> <li>(i) Water of high quality suitable for potable supply abstractions and for all abstractions</li> <li>(ii) Game or other high class fisheries</li> <li>(iii) High amenity value</li> </ul>
1B Good Quality	<ul style="list-style-type: none"> <li>(i) DO greater than 60% saturation</li> <li>(ii) BOD not greater than 5 mg/l</li> <li>(iii) Ammonia not greater than 0.9 mg/l</li> <li>(iv) Where water is abstracted for drinking water, it complies with the requirements for A2* water</li> <li>(v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)</li> </ul>	<ul style="list-style-type: none"> <li>(i) Average BOD probably not greater than 2 mg/l</li> <li>(ii) Average ammonia probably not greater than 0.5 mg/l</li> <li>(iii) Visible evidence of pollution should be absent</li> <li>(iv) Waters of high quality which cannot be placed in Class 1A because of the high proportion of high quality effluent present or because of the effect of physical factors such as canalisation, low gradient or eutrophication</li> <li>(v) Class 1A and Class 1B together are essentially the Class 1 of the River Pollution Survey (RPS)</li> </ul>	<ul style="list-style-type: none"> <li>Water of less high quality than Class 1A but usable for substantially the same purposes</li> </ul>
2 Fair Quality	<ul style="list-style-type: none"> <li>(i) DO greater than 40% saturation</li> <li>(ii) BOD not greater than 9 mg/l</li> <li>(iii) Where water is abstracted for drinking water it complies with the requirements for A3* water</li> <li>(iv) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)</li> </ul>	<ul style="list-style-type: none"> <li>(i) Average BOD probably not greater than 5 mg/l</li> <li>(ii) Similar to Class 2 of RPS</li> <li>(iii) Water not showing physical signs of pollution other than humic colouration and a little foaming below weirs</li> </ul>	<ul style="list-style-type: none"> <li>(i) Waters suitable for potable supply after advanced treatment</li> <li>(ii) Supporting reasonably good coarse fisheries</li> <li>(iii) Moderate amenity value</li> </ul>

3 Poor Quality	(i) DO greater than 10% saturation (ii) Not likely to be anaerobic (iii) BOD not greater than 17 mg/l. This may not apply if there is a high degree of re-aeration	Similar to Class 3 of RPS	Waters which are polluted to an extent that fish are absent only sporadically present. May be used for low grade industrial abstraction purposes. Considerable potential for further use if cleaned up
----------------	---	---------------------------	--

4 Bad Quality	Waters which are inferior to Class 3 in terms of dissolved oxygen and likely to be anaerobic at times	Similar to Class 4 of RPS	Waters which are grossly polluted and are likely to cause nuisance
---------------	---	---------------------------	--

X	DO greater than 10% saturation		Insignificant watercourses and ditches not usable, where the objective is simply to prevent nuisance developing
---	--------------------------------	--	---

- es
- (a) Under extreme weather conditions (eg flood, drought, freeze-up), or when dominated by plant growth, or by aquatic plant decay, rivers usually in Class 1, 2, and 3 may have BODs and dissolved oxygen levels, or ammonia content outside the stated levels for those Classes. When this occurs the cause should be stated along with analytical results.
  - (b) The BOD determinations refer to 5 day carbonaceous BOD (ATU). Ammonia figures are expressed as NH<sub>4</sub>. \*\*
  - (c) In most instances the chemical classification given above will be suitable. However, the basis of the classification is restricted to a finite number of chemical determinands and there may be a few cases where the presence of a chemical substance other than those used in the classification markedly reduces the quality of the water. In such cases, the quality classification of the water should be down-graded on the basis of biota actually present, and the reasons stated.
  - (d) EIFAC (European Inland Fisheries Advisory Commission) limits should be expressed as 95 percentile limits.

EC category A2 and A3 requirements are those specified in the EEC Council directive of 16 June 1975 concerning the Quality of Surface Water intended for Abstraction of Drinking Water in the Member State.

Ammonia Conversion Factors

(mg NH<sub>4</sub>/l to mg N/l)

Class 1A	0.4 mg NH <sub>4</sub> /l = 0.31 mg N/l
Class 1B	0.9 mg NH <sub>4</sub> /l = 0.70 mg N/l
	0.5 mg NH <sub>4</sub> /l = 0.39 mg N/l

## NWC RIVER CLASSIFICATION SYSTEM

## CRITERIA USED BY NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION FOR NON-METALLIC DETERMINANDS

River Class	Quality Criteria
1A	Dissolved oxygen % saturation greater than 80% BOD (ATU) not greater than 3 mg/l O Total ammonia not greater than 0.31 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 21.5 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
1B	Dissolved oxygen % saturation greater than 60% BOD (ATU) not greater than 5 mg/l O Total ammonia not greater than 0.70 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 21.5 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
2	Dissolved oxygen & saturation greater than 40% BOD (ATU) not greater than 9 mg/l O Total ammonia not greater than 1.56 mg/l N Non-ionised ammonia not greater than 0.021 mg/l N Temperature not greater than 28 C pH greater than 5.0 and less than 9.0 Suspended solids not greater than 25 mg/l
3	Dissolved oxygen % saturation greater than 10% BOD (ATU) not greater than 17 mg/l O
4	Dissolved oxygen % saturation not greater than 10% BOD (ATU) greater than 17 mg/l O

## STATISTICS USED BY NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION

Determinand	Statistic
Dissolved oxygen	5 percentile
BOD (ATU)	95 percentile
Total ammonia	95 percentile
Non-ionised ammonia	95 percentile
Temperature	95 percentile
pH	5 percentile
	95 percentile
Suspended solids	arithmetic mean

## NWC RIVER CLASSIFICATION SYSTEM

## CRITERIA USED BY NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION FOR METALLIC DETERMINANDS

## SOLUBLE COPPER

Total Hardness (mean) mg/l CaCO <sub>3</sub>	Statistic	Soluble Copper*	
		Class 1 ug/l Cu	Class 2
0 - 10	95 percentile	< = 5	> 5
10 - 50	95 percentile	< = 22	> 22
50 - 100	95 percentile	< = 40	> 40
100 - 300	95 percentile	< = 112	> 112

\* Total copper is used for classification until sufficient data on soluble copper can be obtained.

## TOTAL ZINC

Total Hardness (mean) mg/l CaCO <sub>3</sub>	Statistic	Total Zinc		
		Class 1 ug/l Zn	Class 2	Class 3
0 - 10	95 percentile	< = 30	< = 300	> 300
10 - 50	95 percentile	< = 200	< = 700	> 700
50 - 100	95 percentile	< = 300	< = 1000	> 1000
100 - 300	95 percentile	< = 500	< = 2000	> 2000

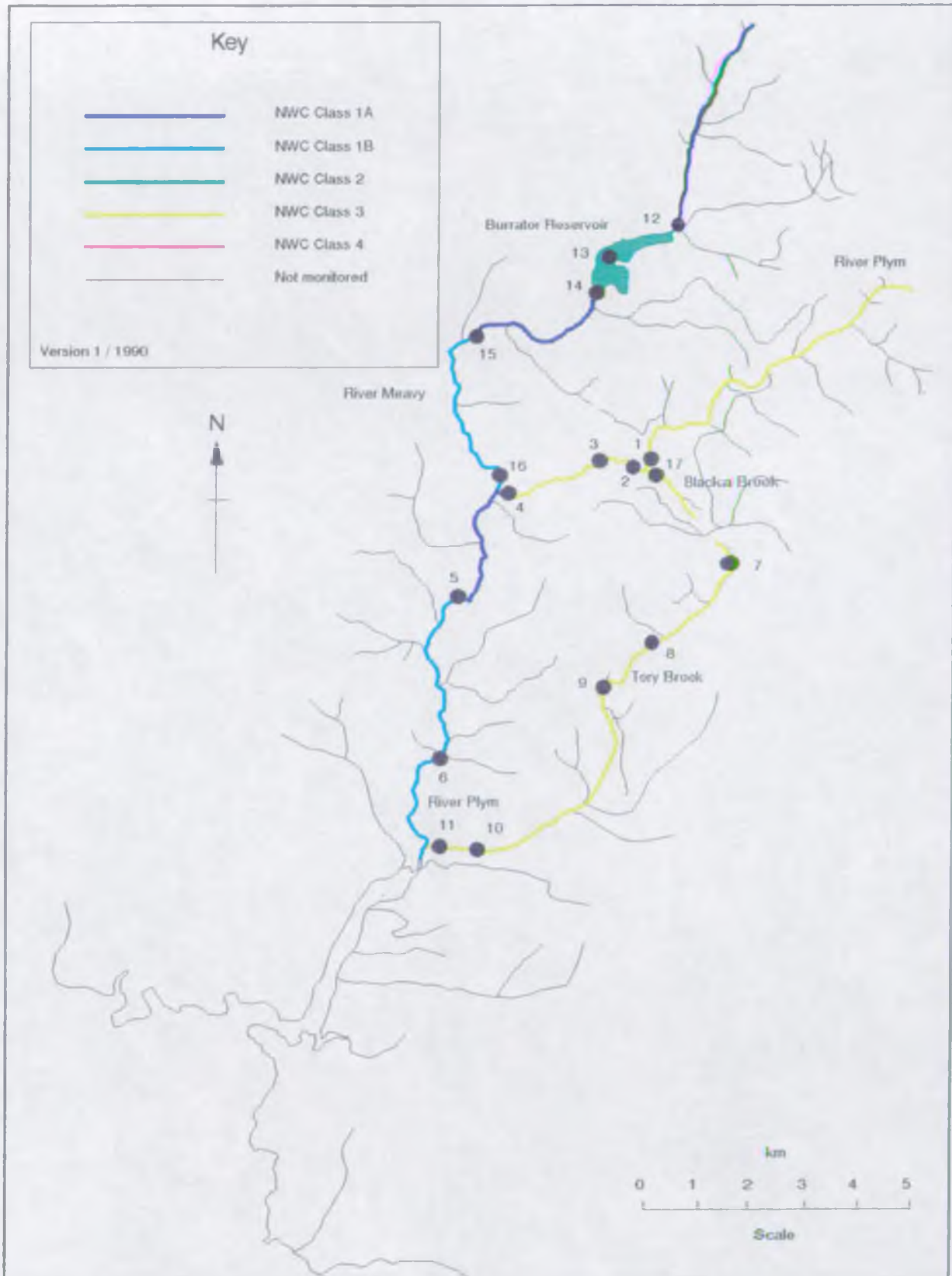


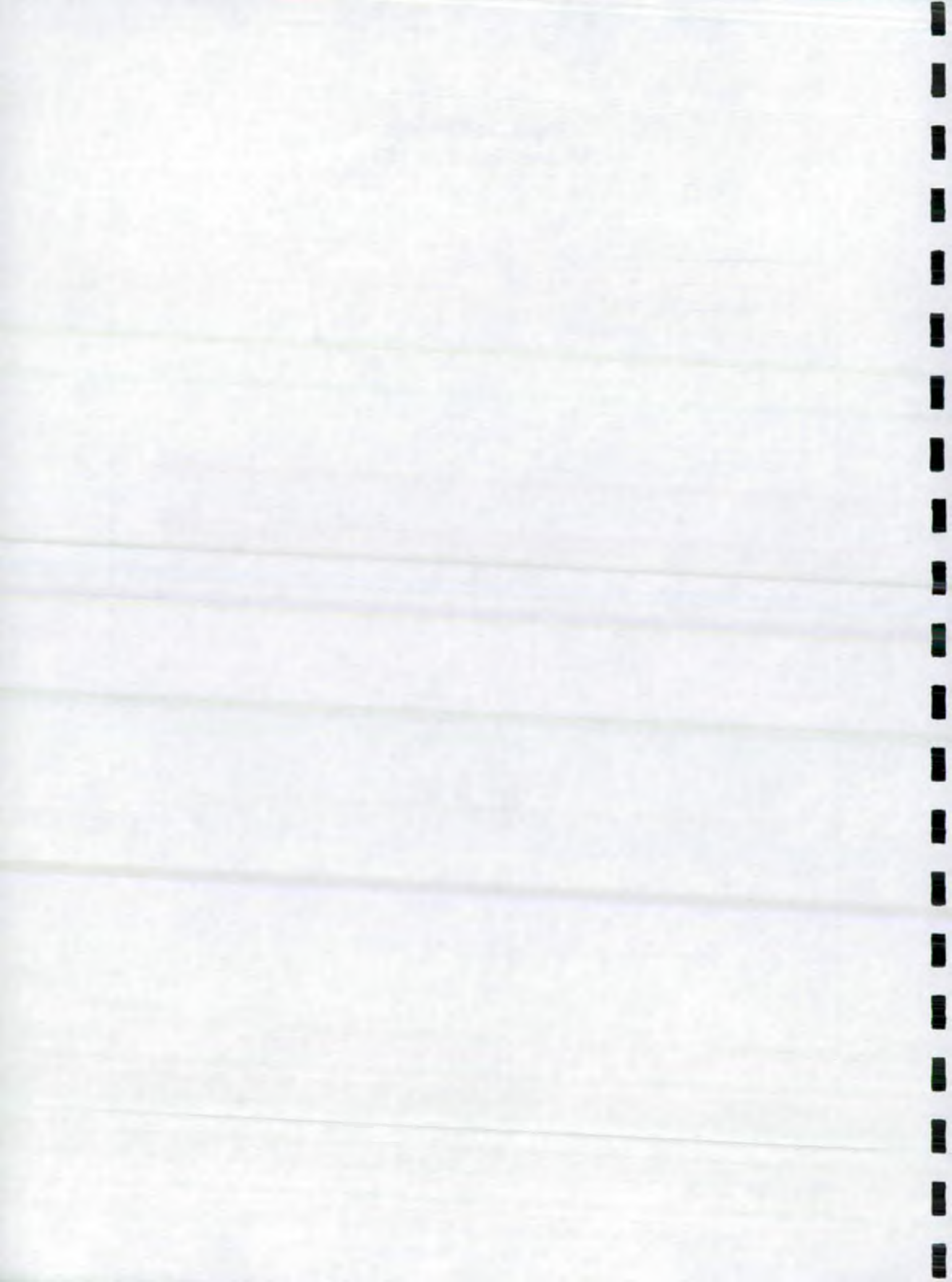
NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION  
 1990 RIVER WATER QUALITY CLASSIFICATION  
 CATCHMENT : PLYM (11)

1990 Map Position Number	River	Reach upstream of	User Reference Number	National Grid Reference
1	PLYM	ABOVE BLACKABROOK	R11B001	SX 5648 6446
2	PLYM	BELOW BLACKABROOK	R11B002	SX 5639 6450
3	PLYM	CADOVER BRIDGE	R11B003	SX 5556 6465
4	PLYM	SHAUGH BRIDGE (WOODEN)	R11B004	SX 5335 6368
5	PLYM	BICKLEIGH	R11B018	SX 5270 6181
6	PLYM	PLYM BRIDGE	R11B006	SX 5237 5867
	PLYM	NORMAL TIDAL LIMIT (INFERRED STRETCH)		
7	TORY BROOK	TOLCHMOOR BRIDGE	R11A001	SX 5786 6173
8	TORY BROOK	COLELAND BRIDGE	R11A002	SX 5655 6075
9	TORY BROOK	PORTWORTHY BRIDGE	R11A003	SX 5565 6008
10	TORY BROOK	STATION ROAD PLYMPTON	R11A004	SX 5392 5655
11	TORY BROOK	MARSH MILLS BRIDGE	R11A005	SX 5275 5660
	TORY BROOK	NORMAL TIDAL LIMIT (INFERRED STRETCH)		
12	MEAVY	WEIR ABOVE BURRATOR RESERVOIR	R11B008	SX 5669 6925
13	MEAVY	BURRATOR RESERVOIR	R11B028	SX 5551 6856
14	MEAVY	BELOW BURRATOR RESERVOIR	R11B009	SX 5514 6791
15	MEAVY	GRATTON FORD BRIDGE	R11B010	SX 5295 6704
16	MEAVY	SHAUGH AT CONFLUENCE WITH RIVER PLYM	R11B011	SX 5330 6375
	MEAVY	PLYM CONFLUENCE (INFERRED STRETCH)		
17	BLACKABROOK	AT CONFLUENCE WITH RIVER PLYM	R11B007	SX 5646 6441
	BLACKABROOK	PLYM CONFLUENCE (INFERRED STRETCH)		

Reach Length (km)	Distance from source (km)	River Quality Objective	85 NWC Class	86 NWC Class	87 NWC Class	88 NWC Class	89 NWC Class	90 NWC Class
8.4	8.4	1A	1B	1B	3	1B	3	3
0.1	8.5	1A	1B	1B	1A	1B	3	3
1.2	9.7	1A	1B	1B	3	1B	3	3
2.7	12.4	1A	1B	1B	1A	1B	3	3
2.9	15.3	1A	1A	1A	1A	1B	1B	1A
3.9	19.2	1A	1A	1A	1A	1B	1B	1B
2.1	21.3	1A	1A	1A	1A	1B	1B	1B
1.3	1.3	2	3	3			3	3
1.8	3.1	2	3	3			3	3
1.3	4.4	2	3	3			3	3
4.6	9.0	2	3	3			3	3
1.2	10.2	2	3	3			3	3
0.3	10.5	2	3	3			3	3
4.8	4.8	1A	1A	1A	1A	1A	1A	1A
2.0	6.8	1A	1A	1A	1A	1B	2	2
0.0	6.8	1A	1A	1A	1A	1B	2	1A
3.4	10.2	1A	1A	1A	1A	1A	1A	1A
4.8	15.0	1A	1A	1A	1A	1A	1B	1B
0.1	15.1	1A	1A	1A	1A	1A	1B	1B
1.6	1.6	1B	1B	1B	3		3	3
0.1	1.7	1B	1B	1B	3		3	3

### Plym Catchment Water Quality - 1990

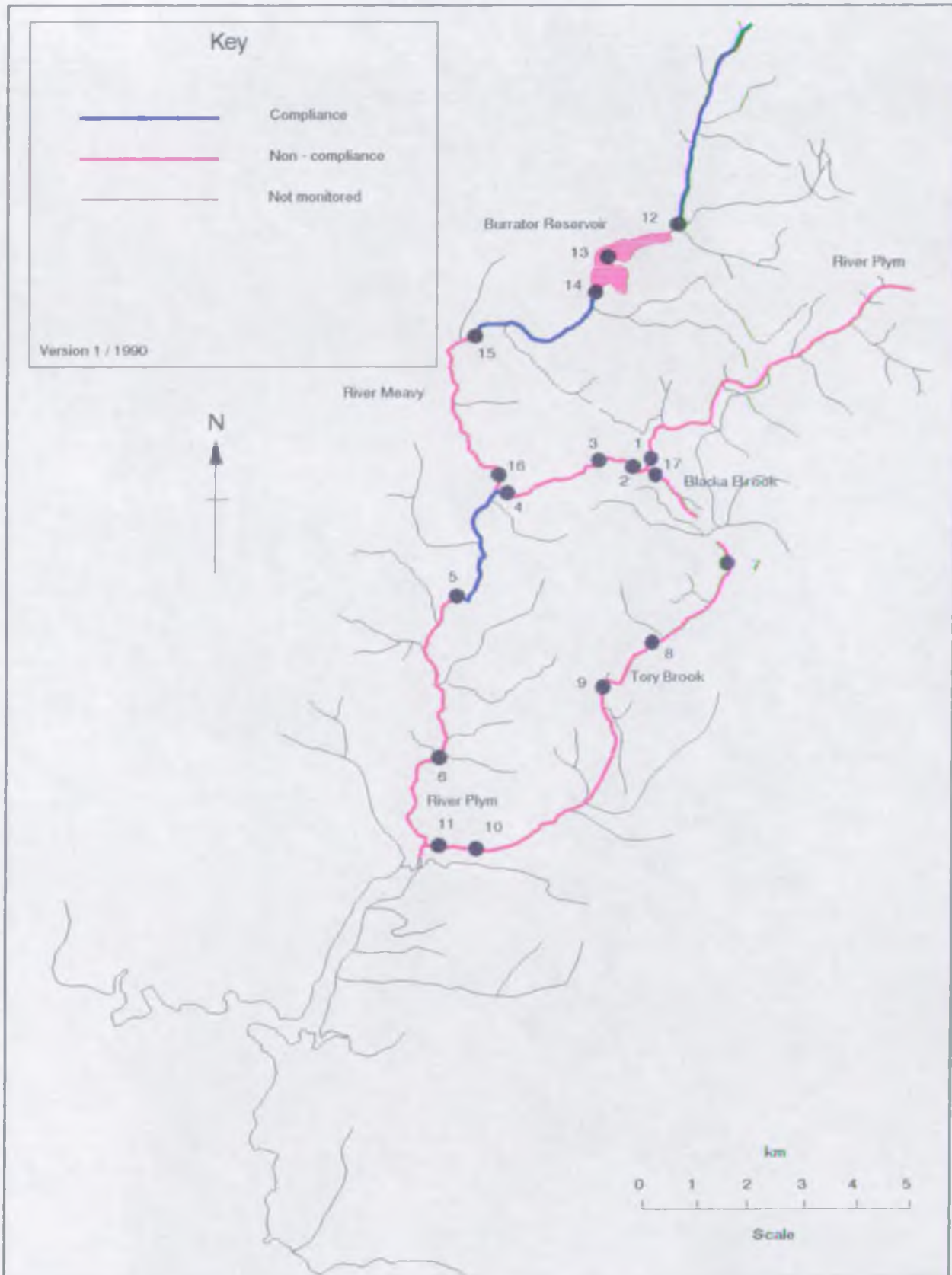




NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION  
 1990 RIVER WATER QUALITY CLASSIFICATION  
 CALCULATED DETERMINED STATISTICS USED FOR QUALITY ASSESSMENT  
 CRUICKSHANK : FLEM (11)

River	Reach upstream of	User Ref. Number	90 NMC Class	Calculated Determined Statistics used for Quality Assessment																			
				pH Lower Class 5tile		pH Upper Class 95tile		Temperature Class 95tile		DO (%) Class 5tile		BOD (AKU) Class 95tile		Total Ammonia Class 95tile		Union. Ammonia Class 95tile		S.Solids Class Mean		Total Copper Class 95tile		Total Zinc Class 95tile	
FLEM	ABOVE BLACKBROOK	[R11B001]	3	3	4.3	1A	6.8	1A	18.7	1B	73.5	1B	3.6	1A	0.035	1A	0.010	1A	1.4	2	13.0	1A	21.0
FLEM	BELOW BLACKBROOK	[R11B002]	3	3	4.4	1A	6.7	1A	18.8	1A	85.7	1A	2.9	1A	0.045	1A	0.010	1A	1.3	1A	4.0	2	90.0
FLEM	LONGOVER BRIDGE	[R11B003]	3	3	4.5	1A	7.1	1A	20.2	1A	90.0	1A	3.0	1A	0.040	1A	0.010	1A	8.4	1A	5.0	1A	20.6
FLEM	SEWAGE BRIDGE (WOODEN)	[R11B004]	3	3	4.8	1A	7.7	1A	17.1	1A	84.4	1B	3.1	1A	0.040	1A	0.010	1A	3.5	1A	3.0	2	33.0
FLEM	RICKLEIGH	[R11B018]	1A	1A	6.2	1A	8.0	1A	15.0	1A	90.1	1A	3.0	1A	0.069	1A	0.010	1A	4.4	1A	7.0	1A	7.0
FLEM	FLEM BRIDGE	[R11B006]	1B	1A	6.3	1A	7.4	1A	16.3	1A	87.6	1B	3.9	1A	0.063	-	-	1A	5.8	1A	6.9	1A	21.1
TORY BROOK	WELCHPOOR BRIDGE	[R11A001]	3	3	4.0	1A	7.4	1A	16.9	1A	86.0	1B	3.9	1A	0.597	1A	0.010	3	132.6	2	42.0	1A	30.0
TORY BROOK	CLELAND BRIDGE	[R11A002]	3	3	3.2	1A	7.3	1A	17.4	1A	90.0	1A	2.7	1A	0.197	1A	0.010	3	78.0	2	49.0	1A	104.0
TORY BROOK	FORDMORRIS BRIDGE	[R11A003]	3	3	4.1	1A	7.5	1A	17.7	1A	85.2	1A	2.7	1A	0.255	1A	0.010	3	42.2	-	-	-	-
TORY BROOK	SUTTON FORD FLEMPTON	[R11A004]	3	1A	6.3	1A	7.6	1A	17.4	1A	85.6	1B	3.3	1B	0.474	1A	0.010	3	33.5	1A	36.0	1A	53.0
TORY BROOK	DURSH MILLS BRIDGE	[R11A005]	3	1A	5.8	1A	7.8	1A	17.2	1B	67.4	1B	3.5	2	0.812	1A	0.010	3	44.3	1A	26.0	1A	59.0
MENY	WEIR ABOVE HLEBROOK RESERVOIR	[R11B008]	1A	1A	5.3	1A	6.9	1A	15.0	1A	89.2	1A	2.6	1A	0.027	1A	0.010	1A	2.0	1A	5.0	1A	12.5
MENY	HLEBROOK RESERVOIR	[R11B028]	2	1A	5.8	1A	7.0	2	21.6	2	50.0	1B	3.2	1A	0.040	-	-	1A	3.3	-	-	-	-
MENY	BELOW HLEBROOK RESERVOIR	[R11B009]	1A	1A	5.7	1A	7.1	1A	18.0	1A	87.3	1A	2.8	1A	0.040	1A	0.010	1A	1.7	1A	6.2	1A	9.4
MENY	GRANTON FORD BRIDGE	[R11B010]	1A	1A	6.0	1A	7.2	1A	16.7	1A	88.3	1A	2.8	1A	0.056	1A	0.010	1A	3.5	1A	5.0	1A	8.0
MENY	SEWAGE AT CONFLUENCE WITH RIVER FLEM	[R11B011]	1B	1A	6.0	1A	7.3	1A	15.4	1A	88.6	1B	3.1	1A	0.055	1A	0.010	1A	4.0	1A	5.2	1A	11.2
BLACKBROOK	AT CONFLUENCE WITH RIVER FLEM	[R11B007]	3	3	4.2	1A	7.2	1A	19.9	1B	61.5	1A	2.9	1A	0.030	1A	0.010	1A	1.7	2	6.0	2	48.0

### Plym Catchment Compliance - 1990



NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION

1990 RIVER WATER QUALITY CLASSIFICATION

NUMBER OF SAMPLES (N) AND NUMBER OF SAMPLES EXCEEDING QUALITY STANDARD (P)

COMMENT : FLUM (11)

River	Reach upstream of	User Ref. Number	pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
			N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P
FLUM	ABOVE BLACKBROOK	RL1B001	28	4	28	-	26	-	25	1	27	2	28	-	15	-	28	-	18	3	18	-
FLUM	BELOW BLACKBROOK	RL1B002	28	3	28	-	27	-	26	-	28	-	28	-	20	-	28	-	17	-	17	1
FLUM	CROOVER BRIDGE	RL1B003	29	4	29	-	27	-	27	-	28	-	29	-	21	-	29	2	20	-	20	-
FLUM	SHOUGH BRIDGE (WOODEN)	RL1B004	28	3	28	-	26	-	26	-	26	1	28	-	15	-	28	-	18	-	18	1
FLUM	BROOKSIDE	RL1B016	20	-	20	-	20	-	20	-	19	-	20	-	16	-	20	-	10	-	10	-
FLUM	FLUM BRIDGE	RL1B006	46	-	46	-	45	-	45	-	45	4	46	-	9	-	46	1	41	-	41	-
TIERY BROOK	WELCHPOOR BRIDGE	RL1A001	21	4	21	-	20	-	19	-	21	-	21	-	20	-	21	12	14	-	14	-
TIERY BROOK	COLELAND BRIDGE	RL1A002	26	8	26	-	25	-	25	-	26	-	26	-	20	-	26	16	16	-	18	-
TIERY BROOK	FORDMONEY BRIDGE	RL1A003	21	3	21	-	21	-	21	-	21	-	21	-	20	-	21	11	9	-	9	-
TIERY BROOK	SINGTON ROAD PLANTING	RL1A004	23	-	23	-	23	-	23	-	23	-	23	-	22	-	23	6	19	-	19	-
TIERY BROOK	GREEN MILLS BRIDGE	RL1A005	26	-	26	-	23	-	23	-	26	-	26	-	22	-	26	13	17	-	17	-
HEWY	WEIR ABOVE BURWOOD RESERVOIR	RL1B008	44	1	44	-	43	-	43	1	43	-	44	-	21	-	44	-	34	-	34	-
HEWY	BURWOOD RESERVOIR	RL1B028	12	-	12	-	12	1	11	1	11	1	12	-	6	-	12	-	6	-	6	-
HEWY	BELOW BURWOOD RESERVOIR	RL1B009	46	-	46	-	45	-	45	1	45	1	46	-	37	-	46	-	31	-	32	-
HEWY	KENTON FORD BRIDGE	RL1B010	47	-	47	-	46	-	45	-	46	-	47	-	33	-	47	1	33	-	33	-
HEWY	SHOUGH AT CONFLUENCE WITH RIVER FLUM	RL1B011	48	-	48	-	47	-	47	1	47	2	48	-	33	-	48	1	36	-	36	-
BLACKBROOK	AT CONFLUENCE WITH RIVER FLUM	RL1B007	28	6	28	-	27	-	26	1	27	-	28	-	16	-	28	-	17	1	17	2

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION  
 1990 RIVER WATER QUALITY CLASSIFICATION  
 PERCENTAGE EXCEEDENCE OF DETERMINAND STATISTICS FROM QUALITY STANDARDS  
 CATCHMENT : PLYM (11)

River	Reach upstream of	User Ref. Number	PERCENTAGE EXCEEDENCE OF STATISTIC FROM QUALITY STANDARD									
			pH Lower	pH Upper	Temperature	DO (%)	BOD (ATU)	Total Ammonia	Un-ionised Ammonia	Suspended Solids	Total Copper	Total Zinc
PLYM	ABOVE BLACKABROOK	R11B001	13	-	-	8	21	-	-	-	160	-
PLYM	BELOW BLACKABROOK	R11B002	11	-	-	-	-	-	-	-	-	200
PLYM	CADOVER BRIDGE	R11B003	10	-	-	-	-	-	-	-	-	-
PLYM	SHAUGH BRIDGE (WOODEN)	R11B004	4	-	-	-	2	-	-	-	-	20
PLYM	BICKLEIGH	R11B018	-	-	-	-	-	-	-	-	-	-
PLYM	PLYM BRIDGE	R11B006	-	-	-	-	30	-	-	-	-	-
TORY BROOK	TOLCHMOOR BRIDGE	R11A001	19	-	-	-	-	-	-	430	-	-
TORY BROOK	COLELAND BRIDGE	R11A002	35	-	-	-	-	-	-	212	-	-
TORY BROOK	PORTWORTHY BRIDGE	R11A003	18	-	-	-	-	-	-	69	-	-
TORY BROOK	STATION ROAD PLYMPTON	R11A004	-	-	-	-	-	-	-	34	-	-
TORY BROOK	MARSH MILLS BRIDGE	R11A005	-	-	-	-	-	-	-	77	-	-
MEAVY	WEIR ABOVE BURRATOR RESERVOIR	R11B008	-	-	-	-	-	-	-	-	-	-
MEAVY	BURRATOR RESERVOIR	R11B028	-	-	-	38	7	-	-	-	-	-
MEAVY	BELOW BURRATOR RESERVOIR	R11B009	-	-	-	-	-	-	-	-	-	-
MEAVY	GRATTON FORD BRIDGE	R11B010	-	-	-	-	-	-	-	-	-	-
MEAVY	SHAUGH AT CONFL. WITH RIVER PLYM	R11B011	-	-	-	-	2	-	-	-	-	-
BLACKABROOK	AT CONFLUENCE WITH RIVER PLYM	R11B007	16	-	-	-	-	-	-	-	20	60



NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION  
 IDENTIFICATION OF POSSIBLE CAUSES OF NON-COMPLIANCE WITH RQO  
 CATCHMENT : PLYM (11)

1990 Map Position Number	River	Reach upstream of	User Reference Number	Reach Length (km)	Possible causes of non-compliance
1	PLYM	ABOVE BLACKABROOK	R11B001	8.4	UP-STREAM ABSTRACTIONS, MOORLAND ORIGINS
2	PLYM	BELOW BLACKABROOK	R11B002	0.1	MOORLAND ORIGINS
3	PLYM	CADOVER BRIDGE	R11B003	1.2	MOORLAND ORIGINS
4	PLYM	SHAUGH BRIDGE (WOODEN)	R11B004	2.7	CHINA CLAY DISCHARGES, MOORLAND ORIGINS
6	PLYM	PLYM BRIDGE	R11B006	3.9	LAND RUN-OFF, STORM OVERFLOWS, SPATE
7	TORY BROOK	TOLCHMOOR BRIDGE	R11A001	1.3	CHINA CLAY DISCHARGE, MOORLAND ORIGINS
8	TORY BROOK	COLELAND BRIDGE	R11A002	1.8	CHINA CLAY DISCHARGE, SEWAGE TREATMENT WORKS
9	TORY BROOK	PORTWORTHY BRIDGE	R11A003	1.3	CHINA CLAY DISCHARGE
10	TORY BROOK	STATION ROAD PLYMPTON	R11A004	4.6	CHINA CLAY DISCHARGE, SEWAGE TREATMENT WORKS
11	TORY BROOK	MARSH MILLS BRIDGE	R11A005	1.2	CHINA CLAY DISCHARGE, SEWAGE TREATMENT WORKS
13	MEAVY	BURRATOR RESERVOIR	R11B028	2.0	IMPOUNDMENT, DROUGHT
16	MEAVY	SHAUGH AT CONFLUENCE WITH RIVER	R11B011	4.8	LAND RUN-OFF, SEPTIC TANK, SEWAGE TREATMENT WORKS
17	BLACKABROOK	AT CONFLUENCE WITH RIVER PLYM	R11B007	1.6	MOORLAND ORIGINS