Environmental Protection Report

River Dart Catchment River Water Quality Classification 1991

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South West Region

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R Broome - Co-ordinator and Editor
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Suggestions for improvements that could be incorporated in the production of the next Classification report would be welcomed.

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RIVER WATER QUALITY IN THE RIVER DART CATCHMENT

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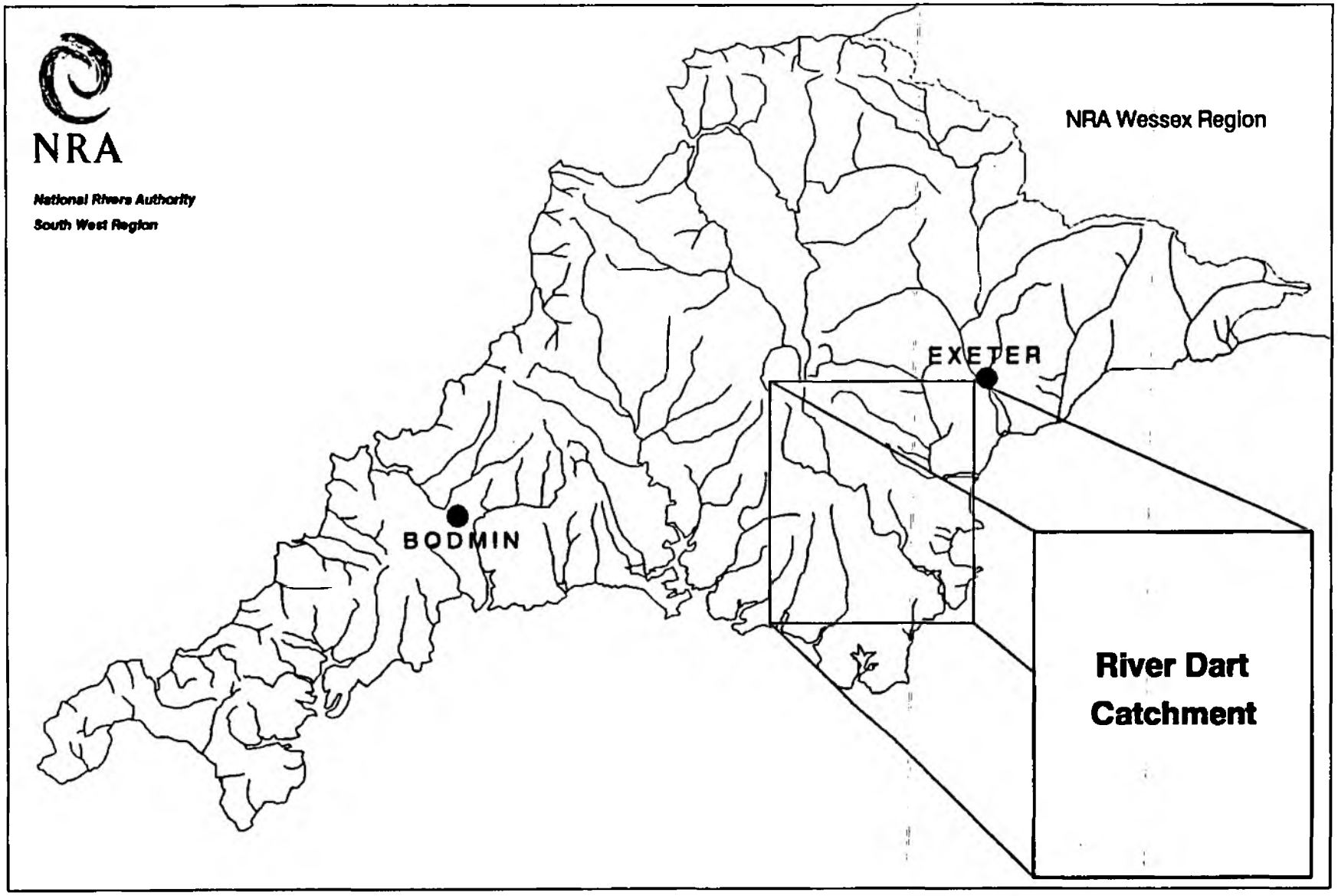
National Rivers Authority
South West Region



River Dart Catchment

1. INTRODUCTION

Monitoring to assess the quality of river waters is undertaken in thirty-four 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.

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), (7.1).

This report presents the river water quality classification for 1991 for monitored river reaches in the River Dart catchment.

2. RIVER DART CATCHMENT

The River Dart flows over a distance of 47.2 km from its source to the tidal limit, (Appendix 8.1). Water quality was monitored at nine locations on the main river; eight of these sites were sampled at approximately monthly intervals. The site at Totnes Weir, which is a National Water Quality monitoring point, was sampled fortnightly.

Throughout the Dart catchment nine secondary tributaries of the River Dart and one secondary tributary of the River Hems were monitored. In addition Venford Reservoir (1.5 km) was monitored at one location at approximately monthly intervals.

The River Hems flows over a distance of 10.8 km from its source to the tidal limit, (Appendix 8.1) and was monitored at two locations at approximately monthly intervals.

The Bidwell Brook flows over a distance of 8.9 km from its source to the tidal limit, (Appendix 8.1) and was monitored at two sites at approximately monthly intervals.

The River Harbourne flows over a distance of 19.5 km from its source to the tidal limit, (Appendix 8.1) and was monitored at three locations at approximately monthly intervals.

The River Wash flows over a distance of 7.2 km from its source to the tidal limit, (Appendix 8.1) and was monitored at one location at approximately monthly intervals.

2.1 SECONDARY TRIBUTARIES

The East Dart River flows over a distance of 17.9 km from its source to the confluence with the River Dart, (Appendix 8.1) and was monitored at two locations, at approximately monthly intervals.

River Ashburn (10 km), Holly Brook (6.6 km), River Swincombe (6.6 km), Cherry Brook (7.9 km), River Mardle (10.1 km), Blackbrook River (7.9 km) and Cowsic (7.1 km) were all monitored at approximately monthly intervals at one location between their source and confluence with the River Dart, (Appendix 8.1). Monitoring points are all located in the lower reaches of these streams.

The Webburn River flows over a distance of 10.8 km from its source to the confluence with the River Dart, (Appendix 8.1) and was monitored at two locations at approximately monthly intervals.

The Am Brook flows over a distance of 6.7 km from its source to the confluence with the River Hems, (Appendix 8.1) and was monitored at two locations at approximately monthly intervals.

2.2 TERTIARY TRIBUTARIES

Dean Burn flows over a distance of 9.7 km from its source to the confluence with the River Mardle, (Appendix 8.1) and was sampled at one site at approximately monthly intervals.

Walla Brook flows over a distance of 7.3 km from its source to the confluence with the East Dart River, (Appendix 8.1) and was sampled at one location at approximately monthly intervals.

The West Webburn River flows over a distance of 10.2 km from its source to the confluence with the East Webburn River, (Appendix 8.1) and was monitored at one location at approximately monthly intervals.

Monitoring points were all located in the lower reaches of these streams.

Each sample was analysed for a minimum number of determinands (Appendix 8.2) plus additional determinands based on local knowledge of the catchment. In addition, at selected sites, certain 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 Resources Act Register, (7.2).

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 Dart catchment are identified in Appendix 8.1.

3.2 River Quality Classification

River water quality is classified using the National Water Council's (NWC) River Classification System (see Appendix 8.3), 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

Class	Description
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 8.4 and 8.4.1.

The quality classification system incorporates some of the European Inland Fisheries Advisory Commission (EIFAC) criteria (Appendix 8.3) recommended for use by the NWC system.

4. 1991 RIVER WATER QUALITY CLASSIFICATION

Analytical data collected from monitoring during 1989, 1990 and 1991 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 8.5.

The quality class for 1991 can be compared against the appropriate River Quality Objective and previous annual quality classes (1985-1990) also based on three years combined data, for each river reach in Appendix 8.5.

The river water classification system used to classify each river length is identical to the system used both in 1985 and 1990 for the Department of the Environment's Quinquennial River Quality Surveys. The determinand classification criteria used to determine the annual quality classes in 1985, subsequent years and for 1991 are indicated in Appendices 8.4 and 8.4.1.

The river quality classes for 1991 of monitored river reaches in the catchment are shown in map form in Appendix 8.6.

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 8.7.

5. 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 8.8.

Appendix 8.9 indicates the number of samples analysed for each determinand over the period 1989 to 1991 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 the relevant quality standard (represented as a percentage), is indicated in Appendix 8.10.

6. 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, 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.

7. REFERENCES

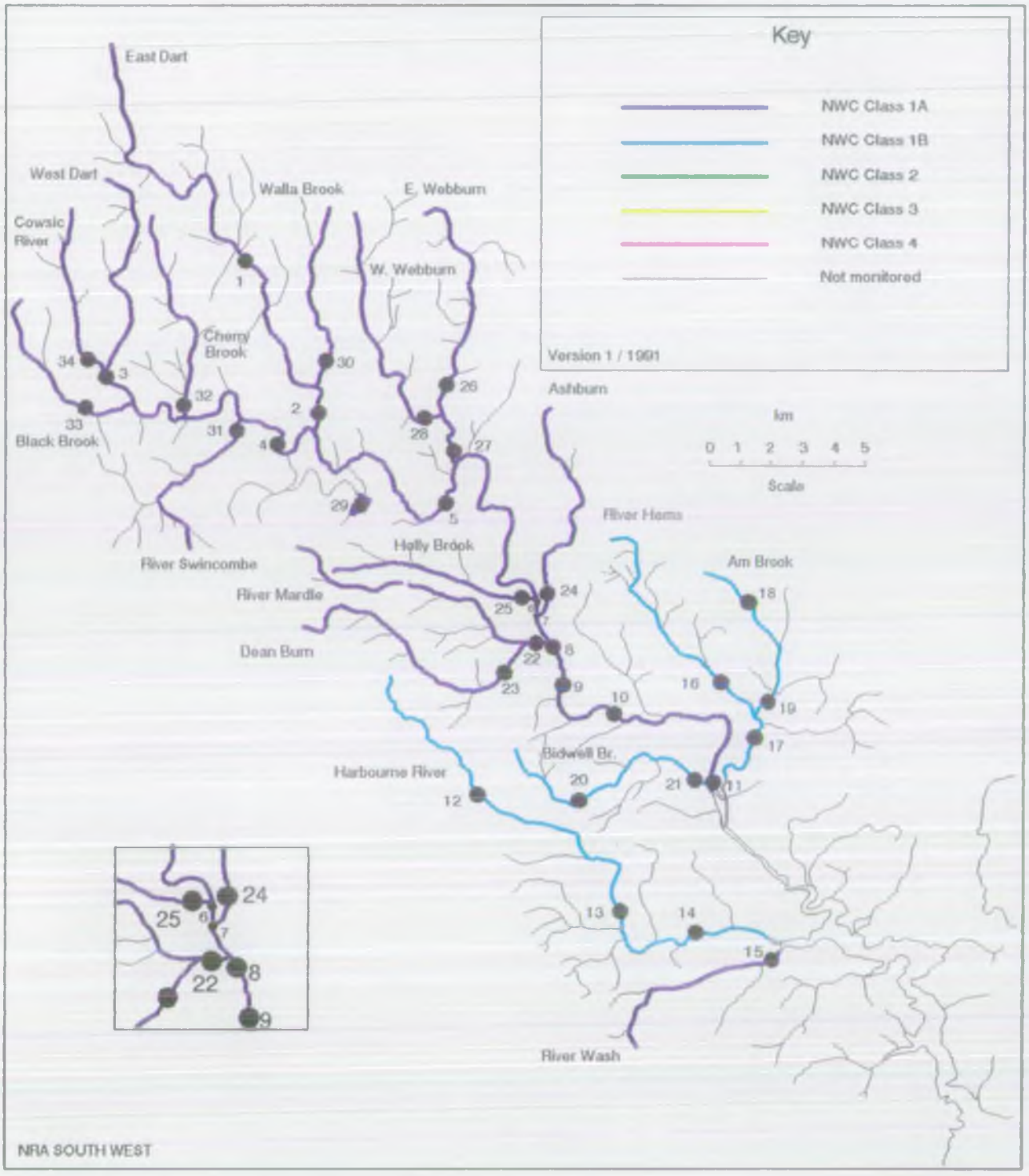
Reference

7.1 National Water Council (1977). River Water Quality: The Next Stage. Review of Discharge Consent Conditions. London.

7.2 Water Resources Act 1991 Section 190.

7.3 Alabaster J. S. and Lloyd R. Water Quality Criteria for Freshwater Fish, 2nd edition, 1982. Butterworths.

Dart 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 CaCO3

Chloride as mg/l Cl

Orthophosphate (total) as mg/l P

Silicate reactive dissolved as mg/l SiO2

Sulphate (dissolved) as mg/l SO4

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 CaCO3

NWC RIVER QUALITY CLASSIFICATION SYSTEM

River Class	Quality criteria	Remarks	Current potential uses
	Class limiting criteria (95 percentile)		
1A Good Quality	(i) Dissolved oxygen saturation greater than 80% (ii) Biochemical oxygen demand not greater than 3 mg/l (iii) Ammonia not greater than 0.4 mg/l (iv) Where the water is abstracted for drinking water, it complies with requirements for A2* water (v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 1.5 mg/l (ii) Visible evidence of pollution should be absent	(i) Water of high quality suitable for potable supply abstractions and for all abstractions (ii) Game or other high class fisheries (iii) High amenity value
1B Good Quality	(i) DO greater than 60% saturation (ii) BOD not greater than 5 mg/l (iii) Ammonia not greater than 0.9 mg/l (iv) Where water is abstracted for drinking water, it complies with the requirements for A2* water (v) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 2 mg/l (ii) Average ammonia probably not greater than 0.5 mg/l (iii) Visible evidence of pollution should be absent (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 (v) Class 1A and Class 1B together are essentially the Class 1 of the River Pollution Survey (RPS)	Water of less high quality than Class 1A but usable for substantially the same purposes
2 Fair Quality	(i) DO greater than 40% saturation (ii) BOD not greater than 9 mg/l (iii) Where water is abstracted for drinking water it complies with the requirements for A3* water (iv) Non-toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available)	(i) Average BOD probably not greater than 5 mg/l (ii) Similar to Class 2 of RPS (iii) Water not showing physical signs of pollution other than humic colouration and a little foaming below weirs	(i) Waters suitable for potable supply after advanced treatment (ii) Supporting reasonably good coarse fisheries (iii) Moderate amenity value

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

Notes (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_4. **

(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.

* EEC 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

($mg\ NH_4/l$ to $mg\ N/l$)

Class 1A 0.4 $mg\ NH_4/l$ = 0.31 $mg\ N/l$
Class 1B 0.9 $mg\ NH_4/l$ = 0.70 $mg\ N/l$
0.5 $mg\ NH_4/l$ = 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 CaCO3	Statistic	Soluble Copper* ug/l Cu Class 1	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 CaCO3	Statistic	Total Zinc ug/l Zn Class 1	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
1991 RIVER WATER QUALITY CLASSIFICATION
CATCHMENT: DART

1991 Map Position Number	River	Reach upstream of	User Reference Number	National Grid Reference	Reach Length (km)	Distance from source (km)	River Quality Objective	85 RWC Class	86 RWC Class	87 RWC Class	88 RWC Class	89 RWC Class	90 RWC Class	91 RWC Class
1	EAST DART RIVER	POSTBRIDGE	R07B001	SX 6478 7893	10.2	10.2	1A	1A	1B	1A	1A	1B	3	3
2	EAST DART RIVER	CLAPPER BRIDGE DARTMEET	R07B002	SX 6720 7320	7.6	17.8	1A	1A	1B	1A	1A	1B	2	2
	EAST DART RIVER	DART CONFLUENCE (INFERRED STRETCH)			0.1	17.9	1A	1A	1B	1A	1A	1B	2	2
3	WEST DART RIVER	TWO BRIDGES	R07B003	SX 6080 7499	7.9	7.9	1A	1A	2	1A	1A	2	3	3
4	WEST DART RIVER	HUCCABY	R07B004	SX 6588 7292	8.4	16.3	1A	1A	2	1A	1A	2	2	2
5	DART	NEW BRIDGE	R07B005	SX 7116 7090	9.0	25.3	1A	1A	1A	1A	1A	1B	2	2
6	DART	BUCKFAST ABBEY	R07B007	SX 7430 6730	9.6	34.9	1A	1A	1A	1A	1A	1A	1A	1B
7	DART	BELOW BUCKFAST PLATING(DART BRIDGE)	R07B038	SX 745 668	0.7	35.6	1A	1A	1A	1A	1A	1A	1A	1A
8	DART	AUSTIN'S BRIDGE	R07B008	SX 7500 6600	1.0	36.6	1A	1A	1A	1A	1A	1A	1B	1B
9	DART	BELOW BUCKFASTLEIGH STW	R07B053	SX 7536 6531	0.8	37.4	1A	1A	1B	1B	1B	1A	1B	1B
10	DART	RIVERFORD BRIDGE	R07B009	SX 7720 6372	3.5	40.9	1A	1A	1B	1B	1B	1A	3	3
11	DART	TOTNES WEIR	R07B010	SX 8010 6122	6.3	47.2	1A	1A	2	1B	1B	1B	1B	1B
12	HARBOURNE RIVER	HARBOURNEFORD	R07A001	SX 7175 6232	4.4	4.4	1B	1B	1A	1A	1A	1A	2	1B
13	HARBOURNE RIVER	LEIGH BRIDGE	R07A002	SX 7710 5666	9.7	14.1	1B	1A	1A	1A	1A	1B	2	1B
14	HARBOURNE RIVER	BEENLEIGH	R07A003	SX 7973 5660	3.8	17.9	1B	1A	1A	1A	1A	1B	2	3
	HARBOURNE RIVER	NORMAL TIDAL LIMIT (INFERRED STRETCH)			1.6	19.5	1B	1A	1A	1A	1A	1B	2	3
15	WASH	TUCKENHAY	R07A004	SX 8176 5590	7.0	7.0	1A	1A	1A	1A	1A	1B	1B	1B
	WASH	NORMAL TIDAL LIMIT (INFERRED STRETCH)			0.2	7.2	1A	1A	1A	1A	1A	1B	1B	1B
16	HEMS	PORTBRIDGE	R07B011	SX 7889 6588	4.9	4.9	1B	1B	1B	3	3	3	3	3
17	HEMS	LITTLEHEMPSTON	R07B012	SX 8115 6237	5.9	10.8	1B	1B	1B	3	3	3	3	3
18	AM BROOK	COLLACOMBE BRIDGE	R07B016	SX 8107 6745	2.2	2.2	1B	2	3	3	3	3	3	3
19	AM BROOK	FISHACRE BRIDGE	R07B017	SX 8190 6445	3.7	5.9	1B	2	1B	2	2	3	3	3
	AM BROOK	HEMS CONFLUENCE (INFERRED STRETCH)			0.8	6.7	1B	2	1B	2	2	3	3	3
20	BIDWELL BROOK	TIGLEY	R07B018	SX 7573 6086	3.5	3.5	1B	2	3	3	2	2	3	2
21	BIDWELL BROOK	DARTINGTON LODGE	R07B019	SX 7990 6150	5.2	8.7	1B	2	3	3	2	2	3	2
	BIDWELL BROOK	DART CONFLUENCE (INFERRED STRETCH)			0.2	8.9	1B	2	3	3	2	2	3	2
22	MARDLE	RAILWAY BRIDGE BUCKFASTLEIGH	R07B014	SX 7472 6612	10.1	10.1	1A	1A	1A	1A	1A	1A	1A	1B
23	DEAN BURN	B3380 BRIDGE	R07B052	SX 7328 6511	8.2	8.2	1A	1A					2	2
	DEAN BURN	MARDLE CONFLUENCE (INFERRED STRETCH)			1.5	9.7	1A	1A					2	2
24	ASHBURN	DART BRIDGE	R07B050	SX 7456 6678	9.8	9.8	1A	1B					1B	2
	ASHBURN	DART CONFLUENCE (INFERRED STRETCH)			0.2	10.0	1A	1B					1B	2
25	HOLY BROOK	NORTHWOOD BUCKFAST	R07B020	SX 7401 6767	6.5	6.5	1A	1A	2	1A	1B	1B	1B	1B
	HOLY BROOK	DART CONFLUENCE (INFERRED STRETCH)			0.1	6.6	1A	1A	2	1A	1B	1B	1B	1B
26	EAST WEBBURN RIVER	COCKINGFORD	R07B036	SX 7168 7508	6.9	6.9	1A		1A	1A	1A	1B	1B	1A

Appendix 8.5

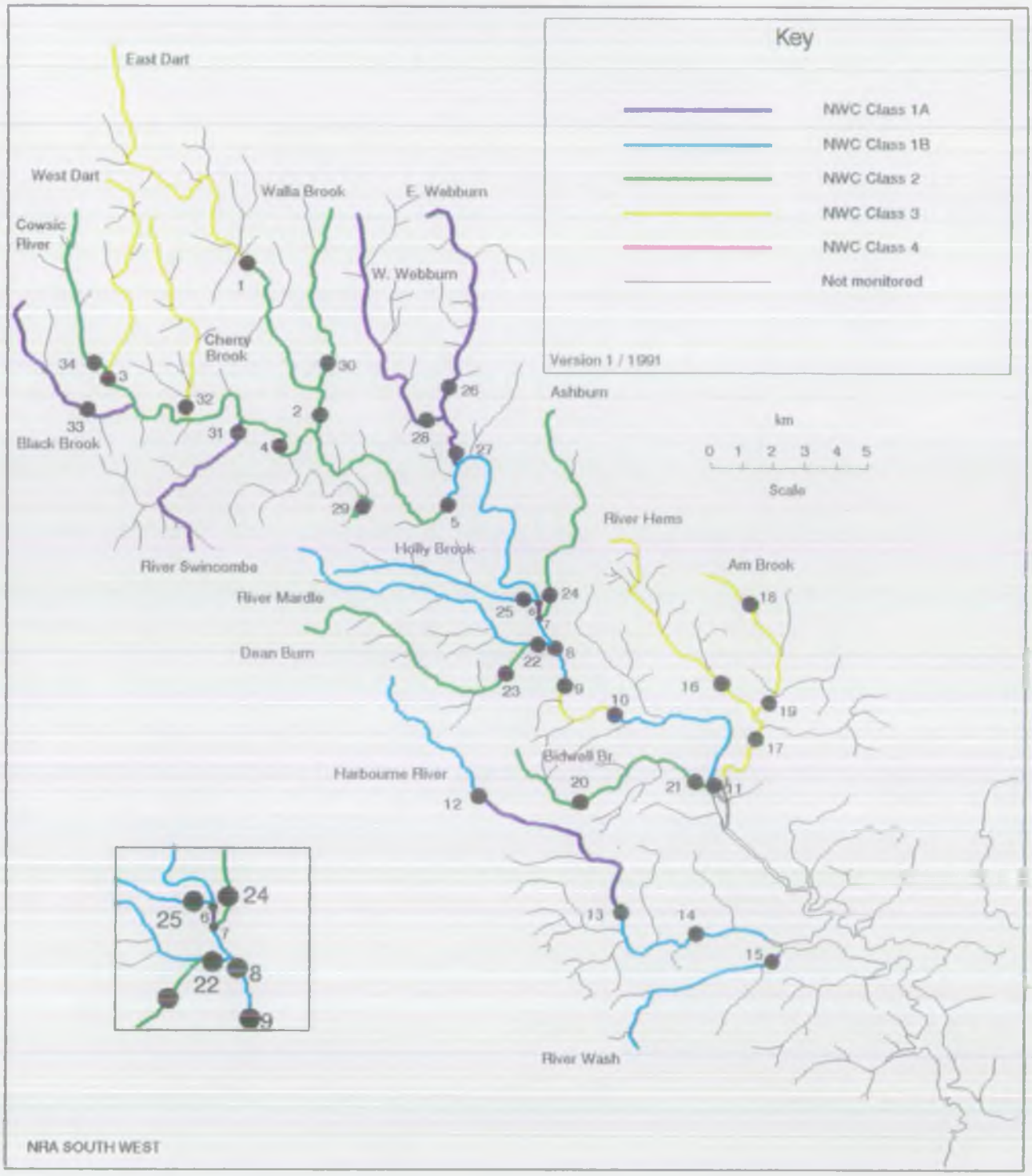
NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
CATCHMENT: DART

1991 Map Position Number	River	Reach upstream of	User Reference Number	National Grid Reference	Reach Length (km)	Distance from source (km)	River Quality Objective	85 RWC Class	86 RWC Class	87 RWC Class	88 RWC Class	89 RWC Class	90 RWC Class	91 RWC Class
27	WEBBURN	BUCKLAND BRIDGE	R07B015	SX 7189 7196	3.9	10.8	1A	1A	1A	1A	1B	2	1B	1A
28	WEST WEBBURN RIVER	PONSWORTHY BRIDGE	R07B037	SX 7011 7390	8.7	8.7	1A		1A	1A	1A	1B	1B	1A
	WEST WEBBURN RIVER	WEBBURN CONFLUENCE (INFERRED STRETCH)			1.5	10.2	1A		1A	1A	1A	1B	1B	1A
	VENFORD BROOK	INFLOW, VENFORD RES. (UNMON. STRETCH)			0.9	0.9	1A						U	U
29	VENFORD BROOK	VENFORD RESERVOIR	R07B048	SX 6858 7105	0.6	1.5	1A						2	2
	VENFORD BROOK	DART CONFLUENCE (UNMONITORED STRETCH)			1.0	2.5	1A						U	U
30	WALLA BROOK	BABENY	R07B051	SX 6730 7516	6.8	6.8	1A	1A					2	2
	WALLA BROOK	EAST DART CONFLUENCE (INFERRED STRETCH)			0.5	7.3	1A	1A					2	2
31	SWINCOMBE	PRIOR TO WEST DART RIVER	R07B021	SX 6475 7370	6.6	6.6	1A	1A	3	1A	1B	1B	3	1A
32	CHERRY BROOK	LOWER CHERRYBROOK BRIDGE	R07B032	SX 6311 7484	6.7	6.7	1A	1B	2	1A	1A	1A	3	3
	CHERRY BROOK	WEST DART CONFLUENCE (INFERRED STRETCH)			1.3	8.0	1A	1B	2	1A	1A	1A	3	3
33	BLACKBROOK RIVER	TOR ROYAL	R07B049	SX 6017 7383	6.0	6.0	1A	1B					1B	1A
	BLACKBROOK RIVER	WEST DART CONFLUENCE (INFERRED STRETCH)			1.9	7.9	1A	1B					1B	1A
34	COMSIC RIVER	BEARDOWN FARM	R07B057	SX 6031 7530	6.6	6.6	1A							2
	COMSIC RIVER	WEST DART CONFLUENCE (INFERRED STRETCH)			0.5	7.1	1A							2

Appendix 8.5

Dart Catchment
Water Quality - 1991

Appendix 8.6



NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
CALCULATED DETERMINAND STATISTICS USED FOR QUALITY ASSESSMENT
CATCHMENT: DART

River	Reach upstream of	User Ref. Number	RQO	Calculated Determinand Statistics used for Quality Assessment																					
				pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
				Class	5%ile	Class	95%ile	Class	95%ile	Class	5%ile	Class	95%ile	Class	95%ile	Class	95%ile	Class	Mean	Class	95%ile	Class	95%ile
EAST DART RIVER	POSTBRIDGE	RO7B001	1A	3	4.9	1A	6.9	1A	14.8	1B	78.6	1A	2.0	1A	0.052	1A	0.010	1A	2.5	1A	5.0	1A	9.9
EAST DART RIVER	CLAPPER BRIDGE DARTMEET	RO7B002	1A	1A	5.2	1A	7.3	1A	16.5	1A	85.2	1A	1.9	1A	0.061	1A	0.010	1A	1.9	2	5.1	1A	10.2
WEST DART RIVER	TWO BRIDGES	RO7B003	1A	3	4.7	1A	6.8	1A	15.8	1A	87.8	1A	1.8	1A	0.055	1A	0.010	1A	1.5	2	5.9	1A	18.2
WEST DART RIVER	HUCCABY	RO7B004	1A	1A	5.5	1A	7.3	1A	16.0	1A	87.0	1A	2.1	1A	0.040	1A	0.010	1A	1.7	2	11.0	1A	12.0
DART	NEW BRIDGE	RO7B005	1A	1A	5.4	1A	7.4	1A	17.1	1B	72.0	1A	3.0	1A	0.101	1A	0.010	1A	1.9	2	6.0	1A	8.9
DART	BUCKFAST ABBEY	RO7B007	1A	1A	6.3	1A	7.4	1A	21.0	1B	77.2	1A	1.8	1A	0.032	1A	0.010	1A	2.2	1A	6.7	1A	12.6
DART	BELOW BUCKFAST PLATING(DART BRIDGE)	RO7E038	1A	1A	6.4	1A	7.7	1A	20.8	1A	93.0	1A	2.1	1A	0.037	1A	0.010	1A	2.4	1A	6.5	1A	70.9
DART	AUSTIN'S BRIDGE	RO7B008	1A	1A	6.8	1A	7.9	1A	20.8	1B	63.3	1A	2.2	1A	0.037	1A	0.010	1A	3.1	1A	5.8	1A	9.5
DART	BELOW BUCKFASTLEIGH STW	RO7B053	1A	1A	6.7	1A	7.8	1A	18.4	1B	67.4	1A	2.6	1B	0.390	1A	0.010	1A	4.1	1A	5.5	1A	27.0
DART	RIVERFORD BRIDGE	RO7B009	1A	1A	6.9	1A	8.3	1A	20.1	1B	78.8	1A	2.1	1A	0.145	3	0.023	1A	6.0	1A	13.0	1A	19.0
DART	TOTNES WEIR	RO7B010	1A	1A	6.9	1A	7.7	1A	18.1	1B	75.9	1A	3.0	1A	0.269	1A	0.010	1A	6.7	1A	7.0	1A	13.0
HARBOURNE RIVER	HARBOURNEFORD	RO7A001	1B	1A	6.8	1A	8.1	1A	15.5	1A	81.1	1B	4.7	1A	0.110	1A	0.010	1A	4.8	–	–	–	–
HARBOURNE RIVER	LEIGH BRIDGE	RO7A002	1B	1A	7.3	1A	8.0	1A	16.7	1A	82.2	1A	2.9	1A	0.275	1A	0.010	1A	7.3	1A	12.6	1A	11.7
HARBOURNE RIVER	BEENLEIGH	RO7A003	1B	1A	7.4	1A	8.3	1A	16.0	1B	71.2	1B	4.9	1B	0.350	1A	0.010	1A	23.3	1A	8.0	1A	27.0
WASH	TUCKENAY	RO7A004	1A	1A	7.4	1A	8.2	1A	15.6	1A	83.9	1A	2.5	1B	0.404	1A	0.010	1A	7.5	1A	5.1	1A	11.1
HEMS	FORDBRIDGE	RO7B011	1B	1A	7.2	1A	8.1	1A	15.9	3	29.1	2	6.4	2	1.503	1A	0.020	3	29.9	1A	53.0	1A	50.0
HEMS	LITTLEHEMPSTON	RO7B012	1B	1A	7.6	1A	8.3	1A	16.0	1B	73.7	2	7.2	2	1.010	1A	0.018	3	26.4	1A	6.0	1A	15.7
AM BROOK	COLLACOMBE BRIDGE	RO7B016	1B	1A	7.4	1A	8.2	1A	15.7	2	56.6	2	7.7	3	4.244	3	0.075	3	29.2	1A	50.0	1A	51.0
AM BROOK	FISHACRE BRIDGE	RO7B017	1B	1A	7.7	1A	8.2	1A	15.0	1B	64.5	2	5.1	3	2.261	3	0.056	1A	15.5	1A	6.0	1A	9.0
BIDWELL BROOK	TEIGLEY	RO7B018	1B	1A	7.5	1A	8.2	1A	15.5	1B	69.2	2	6.2	1B	0.378	1A	0.010	1A	19.8	1A	10.8	1A	52.9
BIDWELL BROOK	DARTINGTON LODGE	RO7B019	1B	1A	7.5	1A	8.0	1A	16.0	2	45.4	2	7.7	2	0.937	1A	0.010	1A	10.1	1A	9.1	1A	20.9
HARLE	RAILWAY BRIDGE BUCKFASTLEIGH	RO7B014	1A	1A	7.3	1A	8.4	1A	18.0	1B	79.6	1A	2.6	1A	0.114	1A	0.010	1A	11.8	1A	22.4	1A	22.0
DEAN BURN	B3380 BRIDGE	RO7B052	1A	1A	6.7	1A	8.0	1A	16.0	2	56.2	1A	2.6	1A	0.180	1A	0.010	1A	14.0	2	47.8	1A	103.0
ASHBURN	DART BRIDGE	RO7B050	1A	1A	7.2	1A	8.5	1A	18.7	2	56.2	2	5.5	1A	0.241	1A	0.010	1A	7.8	1A	6.0	1A	18.2
HOLY BROOK	NORTHWOOD BUCKFAST	RO7B020	1A	1A	6.8	1A	7.6	1A	18.5	1B	72.0	1A	2.6	1A	0.086	1A	0.010	1A	6.7	1A	6.0	1A	13.0
EAST WEBURN RIVER	COCKINGFORD	RO7B036	1A	1A	6.6	1A	7.4	1A	16.0	1A	84.0	1A	2.2	1A	0.090	1A	0.010	1A	4.5	1A	8.0	1A	12.0
WEBURN	BUCKLAND BRIDGE	RO7B015	1A	1A	6.6	1A	7.6	1A	14.6	1A	81.5	1A	2.0	1A	0.050	1A	0.010	1A	2.2	1A	5.1	1A	7.1
WEST WEBURN RIVER	PONSWORTHY BRIDGE	RO7B037	1A	1A	6.6	1A	7.4	1A	14.5	1A	85.0	1A	1.6	1A	0.050	1A	0.010	1A	2.2	1A	5.0	1A	11.0
VENFORD BROOK	VENFORD RESERVOIR	RO7B048	1A	1A	5.5	1A	7.2	1A	18.9	2	57.1	1A	1.5	1A	0.073	1A	0.010	1A	2.1	2	6.5	1A	17.0
MALLA BROOK	BRENT	RO7B051	1A	1A	6.0	1A	7.3	1A	14.6	1A	80.3	1A	1.8	1A	0.047	1A	0.010	1A	1.7	2	6.7	1A	23.0

Appendix 8.7

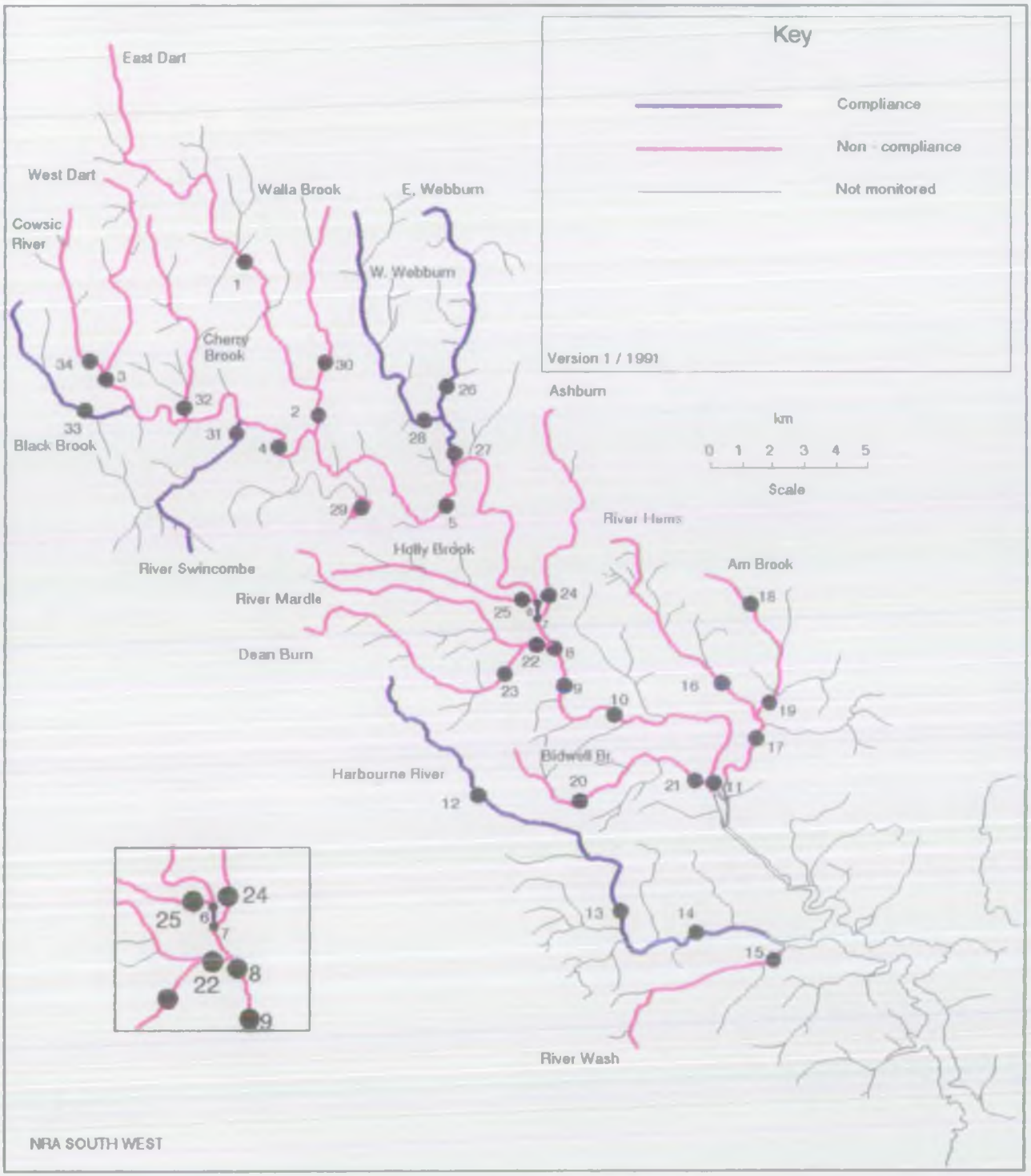
NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
CALCULATED DETERMINAND STATISTICS USED FOR QUALITY ASSESSMENT
CATCHMENT: DART

River	Reach upstream of	User Ref. Number	RQO	Calculated Determinand Statistics used for Quality Assessment																			
				pH Lower		pH Upper		Temperature		DO (%)		BOD (ATU)		Total Ammonia		Union. Ammonia		S.Solids		Total Copper		Total Zinc	
				Class	5%ile	Class	95%ile	Class	95%ile	Class	5%ile	Class	95%ile	Class	95%ile	Class	95%ile	Class	Mean	Class	95%ile	Class	95%ile
SWINCOMBE	PRIOR TO WEST DART RIVER	RO78021	1A	1A	5.1	1A	7.0	1A	15.5	1A	90.0	1A	1.9	1A	0.039	1A	0.010	1A	1.7	1A	5.0	1A	10.0
CHERRY BROOK	LOWER CHERRYBROOK BRIDGE	RO78032	1A	3	5.0	1A	7.0	1A	16.0	1A	85.7	1A	1.8	1A	0.049	1A	0.010	1A	2.3	1A	5.0	1A	21.2
BLACKBROOK RIVER	FOR ROYAL	RO78049	1A	1A	5.9	1A	7.3	1A	15.8	1A	83.3	1A	2.3	1A	0.111	1A	0.010	1A	4.1	1A	7.7	1A	20.2
CONSTC RIVER	MEADOWN FARM	RO78057	1A	1A	5.2	1A	7.0	1A	16.9	1A	89.0	1A	1.8	1A	0.049	1A	0.010	1A	2.1	2	50.0	2	50.0

Appendix 8.7

Dart Catchment
Compliance - 1991

Appendix 8.8



NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
NUMBER OF SAMPLES (N) AND NUMBER OF SAMPLES EXCEEDING QUALITY STANDARD (F)
CATCHMENT: DART

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	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
EAST DART RIVER	FOSTERIDGE	R07B001	35	1	35	–	35	–	35	1	35	–	35	–	24	–	35	1	22	–	22	–
EAST DART RIVER	CLAPPER BRIDGE DARTMEET	R07B002	38	–	38	–	38	–	38	1	38	–	38	–	24	–	38	–	38	1	38	–
WEST DART RIVER	TWO BRIDGES	R07B003	34	2	34	–	34	–	34	–	34	–	34	–	19	–	34	–	21	1	21	–
WEST DART RIVER	HUCCABY	R07B004	39	–	39	–	39	–	39	1	39	–	39	–	28	–	39	–	39	4	39	–
DART	NEW BRIDGE	R07B005	32	–	32	–	32	–	31	1	32	1	32	–	21	–	32	–	20	1	20	–
DART	BUCKFAST ABBEY	R07B007	37	–	37	–	36	–	35	1	37	–	36	–	23	–	37	–	26	–	26	–
DART	BELOW BUCKFAST PLATING(DART BRIDGE)	R07B038	45	–	45	–	44	–	43	–	45	–	45	–	35	–	45	–	36	–	36	–
DART	AUSTIN'S BRIDGE	R07B008	44	–	44	–	43	1	41	2	44	–	44	–	31	–	44	–	44	–	44	–
DART	BELOW BUCKFASTLEIGH STW	R07B053	29	–	29	–	30	–	28	1	29	–	29	3	28	–	29	1	29	–	29	–
DART	RIVERFORD BRIDGE	R07B009	30	–	30	–	28	–	27	1	30	–	30	–	26	1	30	2	18	–	18	–
DART	TOTNES WEIR	R07B010	81	–	81	–	78	–	77	8	79	3	80	1	75	–	79	5	79	–	79	–
HARBOURNE RIVER	HARBOURNEFORD	R07A001	31	–	31	–	31	–	30	–	31	1	31	–	27	–	31	1	1	–	1	–
HARBOURNE RIVER	LEIGH BRIDGE	R07A002	32	–	32	–	31	–	30	–	32	–	32	–	29	–	32	–	20	–	20	–
HARBOURNE RIVER	BEENLEIGH	R07A003	39	–	39	–	38	–	37	–	39	1	39	–	37	–	39	3	39	–	39	–
WASH	TUCKENHAY	R07A004	38	–	38	–	38	–	37	1	38	1	38	3	37	–	38	1	38	–	38	–
HEMS	FORDBRIDGE	R07B011	24	–	24	–	23	–	22	3	24	2	24	4	22	–	24	2	12	–	12	–
HEMS	LITTLEHEMPSTON	R07B012	39	–	39	–	39	–	38	–	39	2	39	3	34	1	39	5	40	–	40	–
AM BROOK	COLLACOMBE BRIDGE	R07B016	30	–	30	–	30	–	30	3	30	3	30	5	28	3	30	6	12	–	12	–
AM BROOK	FISHACRE BRIDGE	R07B017	30	–	30	–	30	–	29	–	30	1	30	2	29	1	30	3	12	–	12	–
BIDWELL BROOK	TIGLEY	R07B018	32	–	32	–	32	–	31	1	32	2	32	–	30	–	32	4	20	–	20	–
BIDWELL BROOK	DARTINGTON LODGE	R07B019	30	–	30	–	29	–	28	7	30	1	30	2	27	–	30	1	25	–	25	–
MARDLE	RAILWAY BRIDGE BUCKFASTLEIGH	R07B014	38	–	38	–	38	–	37	1	38	1	38	–	35	–	38	4	38	–	38	–
DEAN BURN	B3380 BRIDGE	R07B052	32	–	32	–	32	–	31	2	32	–	32	–	27	–	32	1	20	1	20	–
ASHBURN	DART BRIDGE	R07B050	32	–	32	–	32	–	31	2	32	2	32	1	27	–	32	3	26	–	26	–
HOLY BROOK	NORTHWOOD BUCKFAST	R07B020	31	–	31	–	30	–	29	2	31	1	31	–	24	–	31	3	19	–	19	–
EAST WEBBURN RIVER	COCKINGFORD	R07B036	39	–	39	–	39	–	39	1	39	–	39	–	37	–	39	–	39	–	39	–
WEBBURN	BUCKLAND BRIDGE	R07B015	38	–	38	–	37	–	36	1	38	–	38	–	26	–	38	–	38	–	38	–
WEST WEBBURN RIVER	PONSWORTHY BRIDGE	R07B037	39	–	39	–	39	–	39	1	39	–	39	–	28	–	39	–	39	–	39	–
VENFORD BROOK	VENFORD RESERVOIR	R07B048	52	–	52	–	52	1	42	2	51	–	52	–	16	–	52	–	34	2	34	–
WALLA BROOK	BARENY	R07B051	34	–	34	–	34	–	34	1	34	–	34	–	25	–	34	–	22	1	22	–

Appendix 8.9

NATIONAL RIVERS AUTHORITY – SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
NUMBER OF SAMPLES (N) AND NUMBER OF SAMPLES EXCEEDING QUALITY STANDARD (F)
CATCHMENT: DART

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	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F	N	F
SWINCOMBE	PRIOR TO WEST DART RIVER	R07B021	41	1	41	-	41	-	41	1	41	-	41	-	21	-	41	-	39	1	39	-
CHERRY BROOK	LOWER CHERRYBROOK BRIDGE	R07B032	33	1	33	-	33	-	33	-	33	-	33	-	17	-	33	-	23	-	23	-
BLACKBROOK RIVER	TOR ROYAL	R07B049	34	-	34	-	34	-	34	1	34	-	34	-	26	-	34	1	21	-	21	-
COMSTIC RIVER	BEARDOWN FARM	R07B057	21	-	21	-	20	-	20	-	21	-	21	-	10	-	21	-	16	1	16	1

Appendix 8.9

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
PERCENTAGE EXCEEDENCE OF DETERMINAND STATISTICS FROM QUALITY STANDARDS
CATCHMENT: DART

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
EAST DART RIVER	POSTBRIDGE	R07B001	1	-	-	2	-	-	-	-	-	-
EAST DART RIVER	CLAPPER BRIDGE DARTMEET	R07B002	-	-	-	-	-	-	-	-	2	-
WEST DART RIVER	TWO BRIDGES	R07B003	7	-	-	-	-	-	-	-	18	-
WEST DART RIVER	HUCCABY	R07B004	-	-	-	-	-	-	-	-	120	-
DART	NEW BRIDGE	R07B005	-	-	-	10	-	-	-	-	19	-
DART	BUCKFAST ABBEY	R07B007	-	-	-	4	-	-	-	-	-	-
DART	BELOW BUCKFAST PLATING(DART BRIDG	R07B038	-	-	-	-	-	-	-	-	-	-
DART	AUSTIN'S BRIDGE	R07B008	-	-	-	21	-	-	-	-	-	-
DART	BELOW BUCKFASTLEIGH STW	R07B053	-	-	-	16	-	26	-	-	-	-
DART	RIVERFORD BRIDGE	R07B009	-	-	-	1	-	-	10	-	-	-
DART	TOTNES WEIR	R07B010	-	-	-	5	-	-	-	-	-	-
HARBOURNE RIVER	HARBOURNEFORD	R07A001	-	-	-	-	-	-	-	-	-	-
HARBOURNE RIVER	LEIGH BRIDGE	R07A002	-	-	-	-	-	-	-	-	-	-
HARBOURNE RIVER	BEENLEIGH	R07A003	-	-	-	-	-	-	-	-	-	-
WASH	TUCKENHAY	R07A004	-	-	-	-	-	30	-	-	-	-
HEMS	PORTBRIDGE	R07B011	-	-	-	52	29	115	-	19	-	-
HEMS	LITTLEHEMPSTON	R07B012	-	-	-	-	44	44	-	6	-	-
AM BROOK	COLLACOMBE BRIDGE	R07B016	-	-	-	6	55	506	256	17	-	-
AM BROOK	FISHACRE BRIDGE	R07B017	-	-	-	-	-	223	165	-	-	-
BIDWELL BROOK	TIGLEY	R07B018	-	-	-	-	25	-	-	-	-	-
BIDWELL BROOK	DARTINGTON LODGE	R07B019	-	-	-	24	54	34	-	-	-	-
MARDLE	RAILWAY BRIDGE BUCKFASTLEIGH	R07B014	-	-	-	1	-	-	-	-	-	-
DEAN BURN	B3380 BRIDGE	R07B052	-	-	-	31	-	-	-	-	117	-
ASHBURN	DART BRIDGE	R07B050	-	-	-	31	85	-	-	-	-	-
HOLY BROOK	NORTHWOOD BUCKFAST	R07B020	-	-	-	10	-	-	-	-	-	-
EAST WEBBURN RIVER	COCKINGFORD	R07B036	-	-	-	-	-	-	-	-	-	-
WEBBURN	BUCKLAND BRIDGE	R07B015	-	-	-	-	-	-	-	-	-	-
WEST WEBBURN RIVER	PONSWORTHY BRIDGE	R07B037	-	-	-	-	-	-	-	-	-	-
VENFORD BROOK	VENFORD RESERVOIR	R07B048	-	-	-	29	-	-	-	-	30	-
WALLA BROOK	BABENY	R07B051	-	-	-	-	-	-	-	-	34	-

Appendix 8.10

NATIONAL RIVERS AUTHORITY - SOUTH WEST REGION
1991 RIVER WATER QUALITY CLASSIFICATION
PERCENTAGE EXCEEDENCE OF DETERMINAND STATISTICS FROM QUALITY STANDARDS
CATCHMENT: DART

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
SWINCOMBE	PRIOR TO WEST DART RIVER	R07B021	-	-	-	-	-	-	-	-	-	-
CHERRY BROOK	LOWER CHERRYBROOK BRIDGE	R07B032	1	-	-	-	-	-	-	-	-	-
BLACKBROOK RIVER	TOR ROYAL	R07B049	-	-	-	-	-	-	-	-	-	-
COWSIC RIVER	BEARDOWN FARM	R07B057	-	-	-	-	-	-	-	-	900	67

Appendix 8.10