

GA Water Quality
Box 1

THE YARROW CATCHMENT

NORTH WEST

Recommendations for
Statutory Water Quality
Objectives

ENVIRONMENT AGENCY



128004

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INTRODUCTION

The Environment Agency (the Agency) has recently concluded a three-month consultation exercise, initiated by its predecessor organisation, the National Rivers Authority (NRA), in eight "pilot" catchments. The Yarrow Catchment is one such pilot catchment, and SWQO proposals for the catchment were contained in the consultation document; *The Yarrow Catchment: Proposals for Statutory Water Quality Objectives*.

This document sets out the recommendations of the Agency to the Secretaries of State for the Environment and for Wales (the SoS) for Statutory Water Quality Objectives (SWQOs) for stretches of river in the Yarrow Catchment.

To aid interpretation of the Agency's recommendations, the general structure of this document is modelled on the predecessor SWQO proposal document. The primary differences are:

- A new appendix, *Appendix III: Digest of Responses to Consultation*, has been added to provide a summary of responses to our consultation and the actions that we have subsequently taken; and
- Further clarification, in some cases, of the likely costs and benefits associated with proposed water quality maintenance or improvement schemes.

In a minority of river stretches, we proposed two tiers of SWQOs. In these cases, the first tier has a target date within the present investment planning timescale covering the period 1995 to 2005 and a further longer-term tier with a target date of 2006. Where an additional longer-term SWQO has been proposed, its purpose is to reflect the long-term water quality planning base agreed previously for the catchment. The longer-term SWQO proposal ensures that this planning base is not forgotten, and provides a mechanism for identifying priorities for future investment which will be necessary to attain the specified quality. These investment proposals will be taken forward as candidates in future investment planning rounds, and will of course be balanced with other priorities at that time. No new investment, additional to current agreements, is sought from the water industry within the present financial planning period.

This document has been sent to the Secretary of State to inform Government of our recommendations for SWQOs. Therefore, no further comments are required by the Agency at this time, although to obtain further copies you may contact the Area Water Quality Manager, Environment Agency North West Region Central Area Office, Lutra House, Dodd Way, Off Seedlee Road, Walton Summit, Bamber Bridge, Preston, PR5 8BX. On the basis of our recommendations, Government may now proceed with a further period of formal consultation that could ultimately lead to the setting of SWQOs, and will invite further responses during this formal consultation period.

STATUTORY WATER QUALITY OBJECTIVES

The purpose of SWQOs is to establish targets, on a statutory basis, that provide an agreed planning framework for regulatory bodies, dischargers, abstractors and river users. SWQOs will secure achievements to date by providing a statutory "backstop" to existing Consents, as well as providing a vehicle for tackling discharges from non-water sectors of industry, agricultural and other diffuse pollution, and the effects of new or revised abstractions. The SWQO scheme is use-related, based upon a range of water quality standards that protect the "uses" to which waters may be put. There are a number of different potential river uses. River Ecosystem is the only use to date for which standards have been introduced.

The River Ecosystem Use

The River Ecosystem Use is the first of the SWQO uses to be introduced for rivers. The quality standards defining the five River Ecosystem use classes have been introduced by *The Surface Waters (River Ecosystem) (Classification) Regulations 1994*. These standards are reproduced in Table 1. The statistical methods involved in setting SWQOs and further details about application of SWQOs can be found in the document *Water Quality Objectives: Procedures Used by the National Rivers Authority for the purpose of the Surface Waters (River Ecosystem) (Classification) Regulations 1994*, which is available from the Water Quality Planning department of the Environment Agency Regional Offices, or from the address given on page 1.

How SWQOs will be Set

SWQOs, currently based only on the River Ecosystem use, are recommended on a stretch-by-stretch basis for the major rivers within the catchment; they will not apply to our smallest rivers. These targets comprise two parts: a River Ecosystem class, and a date by which compliance should be achieved. Account has been taken of planned investment to ensure that the targets are achievable and, where appropriate, reflect planned improvements in river quality. Where appropriate, we have recommended two-tier SWQOs to protect water quality. The target date for the longer-term SWQOs has been set at 2006 to enable prioritisation of expenditure in future planning rounds, and to enable the SWQO to be reconsidered at the five-yearly review stage.

Through the prior consultation exercise, we sought the views of those with an interest in this catchment, and these views have been taken into account in these recommendations to Government. Government may now proceed with a period of formal consultation, after which SWQOs may be set through Notices served by the Secretary of State. Once formally set, the River Ecosystem classes and dates will represent statutory targets. We will then be under a duty to ensure compliance using the various pollution control powers at our disposal. SWQOs may be reviewed after five years.

Once formally set, SWQOs will have a statutory basis, generally protecting the existing planning base currently expressed as River Quality Objectives (RQOs). SWQOs will therefore provide the basis for the Environment Agency's discharge consenting and water quality planning activities.

Statutory Objectives Introduced by EC Directives

Designations of river stretches, or points on rivers, are also subject to Regulations which enforce standards set by the EC Dangerous Substances Directive (76/464/EEC), and these standards already constitute statutory objectives. The EC Surface Water Abstraction Directive (75/440/EEC) and the EC Freshwater Fisheries Directive (78/659/EEC) also contain mandatory standards. Designations and compliance reports under these three Directives are included in the Catchment Management Plan but do not form part of the recommendations in this document.

TABLE 1: STANDARDS FOR RIVER ECOSYSTEM CLASSES

Class	Dissolved Oxygen % saturation 10 percentile	BOD (ATU) mg/l 90 percentile	Total Ammonia mg N/l 90 percentile	Un-ionised Ammonia mg N/l 95 percentile	pH lower limit as 5 percentile; upper limit as 95 percentile	Hardness mg/l CaCO ₃	Dissolved Copper µg/l 95 percentile	Total Zinc µg/l 95 percentile
RE1	80	2.5	0.25	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5		6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0					

OVERVIEW OF THE YARROW CATCHMENT

Catchment Description

The Yarrow is a sub-catchment of the Douglas, covering an area of approximately 79 km² with a population of around 65,000. It is contained within the county of Lancashire and the river rises above the town of Horwich on Rivington Moor. The moorland area discharges run-off to the water supply reservoirs at Rivington, which subsequently outflows to the river Yarrow. The Yarrow then flows west through Chorley to join the Douglas in its tidal reaches. There are 56 kilometres of classified watercourses in the Yarrow catchment, with four monitoring sites on the main river and an additional monitoring site on the seven major tributaries. Map 1 illustrates the key elements of the catchment.

The solid geology of the catchment progressing from Rivington westwards consists of millstone grits, coal measures, Keuper and Bunter sandstones and Keuper Marl. The surface geology, moving in a similar direction, consists of boulder clays and hill peats in the upper and middle parts, the lower region being covered with alluvial deposits containing extensive areas of lowland peat.

Although principally a rural river, urban pressure on the watercourse is significant around the town of Chorley and, to a lesser extent, the village of Croston. Discharges from sewage treatment works, combined sewer overflows, run-off from urban areas and agricultural inputs are the main issues affecting the catchment.

There are no surface water abstractions for potable supply from the Yarrow, although there are several spray irrigation licences in the lower reaches.

Recent fish stock surveys have confirmed that the fishery in the Yarrow is generally very poor.

Current Water Quality

River chemistry data from the 1990 General Quality Assessment survey determined that 50% of the catchment was of fair quality, 23% was of poor quality, and the remaining 27% were not graded owing to a lack of data. Since 1990, there has been a gradual improvement in the water quality in the Yarrow catchment. Water quality surveys in 1994 have revealed that 79% of the catchment is now of fair quality with the remaining 21% of poor quality.

Catchment Management Plan

The River Douglas Catchment Management Plan Final Report was issued in February 1995. The River Yarrow is a sub-catchment of the River Douglas. This document provides more detailed information on the uses made of the catchment. However, the Douglas catchment Management Plan expressed long term water quality planning targets in terms of the National Water Council (NWC) classification scheme. The NWC classes were originally proposed in 1979. This scheme has now been superseded by the SWQO scheme. The Agency will be publishing an annual review of the Douglas CMP toward the end of 1996 outlining progress with targets and dates originally outlined in the CMP. Included in this review will be a new Water Quality section. This will outline the Agency's proposals for translating the NWC classes for the remainder of the Douglas catchment into River Quality Objectives expressed as River Ecosystem targets. These will form the basis for future SWQOs, in the same manner as the targets outlined in this document for the Yarrow catchment.

PROPOSALS FOR STATUTORY WATER QUALITY OBJECTIVES

Map 2 contains our proposals for SWQOs in the Yarrow catchment.

The old NWC targets described in the Douglas CMP for the Yarrow sub-catchment, have been translated into the non-statutory RQOs expressed in terms of River Ecosystem standards. Generally, RQOs reflect the Agency's view of, and long term agreements on, the needs of river stretches.

Where possible, SWQOs have been proposed at a level consistent with RQOs. Generally, these will be achievable within the 5 to 10 year horizon of investment planning. However, where it has been necessary, owing to restrictions on further investment, to propose an SWQO that is less stringent than the existing RQO, a further longer-term SWQO is proposed. This longer-term SWQO, which has a target date of 2006, is indicated on Map 3. Map 2 is also annotated with the symbol [*] where an additional longer-term target applies.

Further details of the proposed SWQOs for each river stretch are contained in Appendix I.

COMPLIANCE WITH PROPOSED SWQOS

Map 4 compares current water quality with the proposed SWQOs for 11 stretches of river. Where a longer-term SWQO is also proposed, the short term SWQO provides the basis for this assessment. The colour scheme used in the map is:

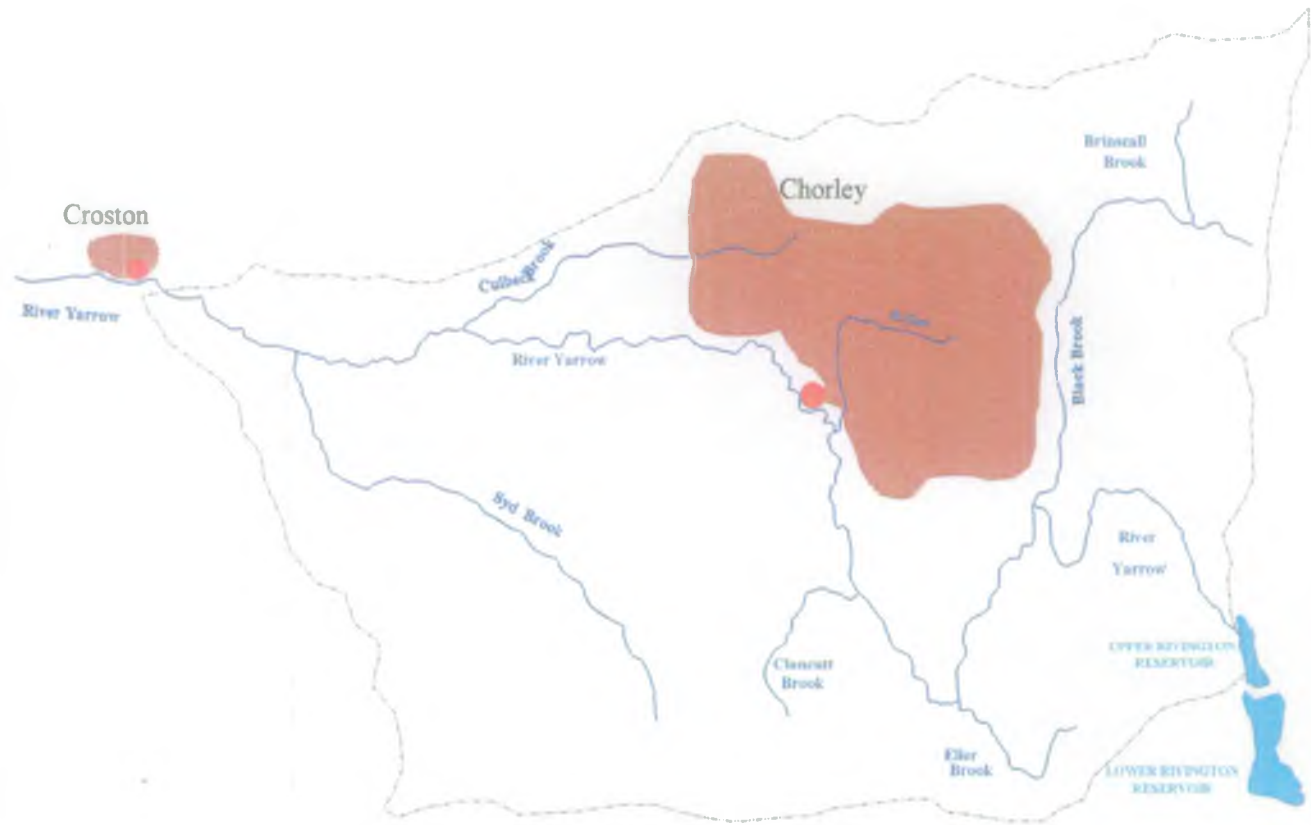
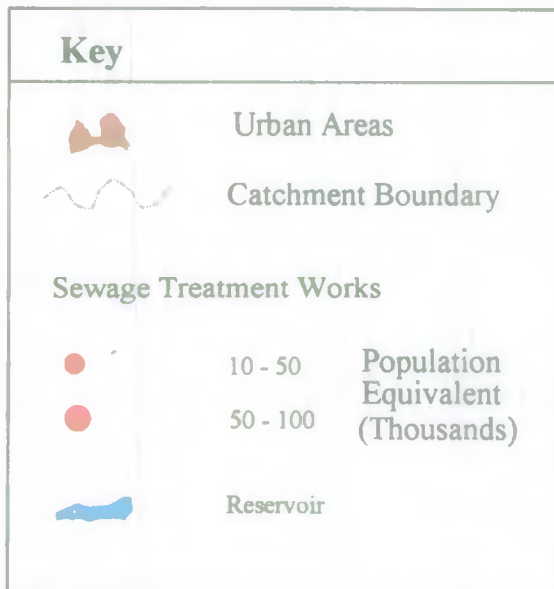
- **Blue (compliant)** indicates that the river stretch currently complies with its target ($\leq 50\%$ confidence of failure)
- **Yellow (marginal)** indicates that, although the river stretch currently complies with its target, there is a risk that it might fail to comply (between 50-95% confidence of failure)
- **Red (failure)** indicates that the river stretch does not currently comply with its target, and that this non-compliance is unlikely to be due to statistical chance ($> 95\%$ confidence of failure)

The small diagrams alongside the failing or marginal river stretches depict those aspects of water quality which do not meet the standards. The rules for assessing compliance are described in detail in the document *Water Quality Objectives: Procedures Used by the National Rivers Authority for the Purpose of the Surface Waters (River Ecosystem) (Classification) Regulations 1994*, which is available from the contact given at the foot of the Introduction page.

Where compliance is marginal, or where a failure is noted, actions to rectify the problem and deliver the proposed SWQO are identified in Appendix II.

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MAP 1: OVERVIEW OF THE CATCHMENT



NOT TO SCALE








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MAP 2: PROPOSED SWQOs



THE YARROW CATCHMENT

MAP 3: LONGER-TERM SWQOs

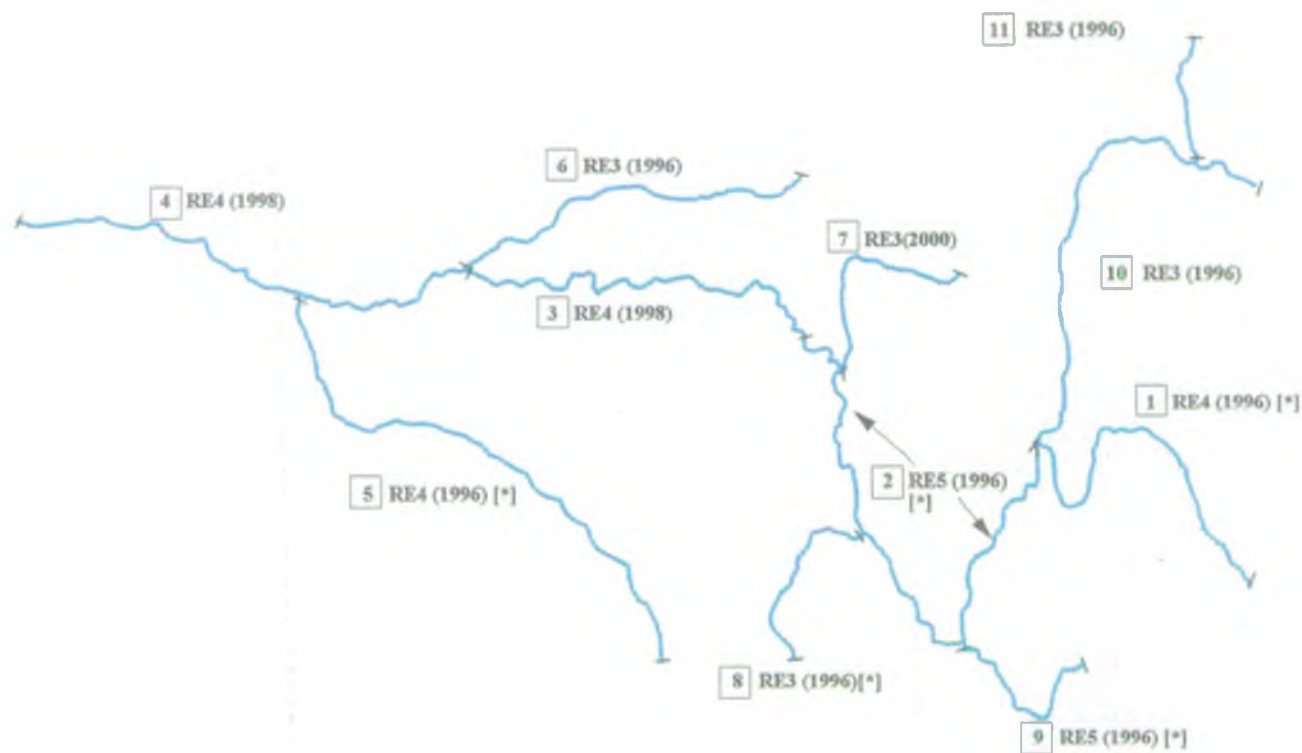
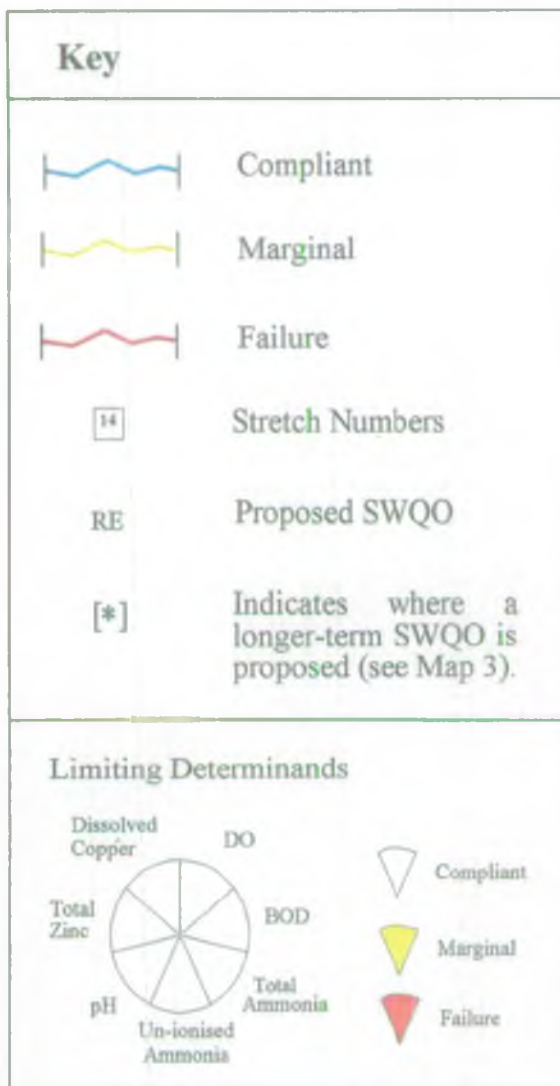
Key	
River Ecosystem Class	
	RE1
	RE2
	RE3
	RE4
	RE5
	Stretch Numbers
	Indicates a longer-term SWQO
Notes:	
●	Longer-term SWQOs will have a target date of 2006.
●	A river stretch with no longer-term SWQO is coloured according to its 1996 SWQO (see Map 2).



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MAP 4: COMPLIANCE WITH SWQOs

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ASSESSMENT OF COSTS AND BENEFITS

Benefits

During consultation on the Catchment Management Plan (CMP), we identified the uses to which the local community wishes to put stretches of river in the Yarrow catchment. Some of these uses are reflected in our recommendations for SWQOs. The beneficiaries of proposed investment include not only the estimated 65,000 people, and future generations, that live within the catchment, but also its annual visitors and the trade that they will bring with them.

Longer-term benefits, that will become increasingly important as population growth and climate change affect the catchment, include preserving future options for the abstraction of water from river stretches that are currently not utilised as sources for public and agricultural supply. Protecting water quality will also help sustain uses downstream of the catchment. Maintenance of river quality, or improvement to support new river uses where recommended, is consistent with the future needs that may be placed upon our water resources, and therefore with the broad aims of sustainable development.

Costs

The costs associated with water quality schemes within the catchment are those necessary to prevent river quality from deteriorating or, where desirable and justifiable, to improve the quality of river stretches within the catchment. Maintenance of river quality, or improvement to support new river uses where recommended, is consistent with the future needs that we may place upon our water resources, and therefore with the broad aims of sustainable development. However, no specific costs are included in Appendix II as, firstly, those for Water Company schemes were not made available to the Agency and secondly, those for sectors other than the water industry cannot be identified accurately at the current time as they are dependent on agreed solutions to identified problems. Work on improving identification of these problems will be undertaken in the future.

In the absence of specific cost information, the requirement for financial investment within the catchment can be broken down into the following categories:

- Water industry expenditure that is already committed and is necessary to maintain river quality against a background of potential deterioration, or to meet other legal obligations (predominantly those required by European Directive);
- Additional investment by the water industry that has already been committed to support nationally-agreed priorities for environmental improvement.
- Investment required by agriculture, or industry sectors other than the water industry, which will be required to both improve and maintain the quality of river water to support identified uses to which the river is put.

The level of investment for sectors other than the Water Industry cannot be identified accurately at the current time as this is dependent on the identification of specific problems with costs dependent on agreed solutions.

In addition, a requirement for further water industry investment is identified to deliver longer-term SWQOs. This investment, which will be necessary to first improve and then maintain the quality of river stretches within the catchment to their planned level, is not being sought in the present water industry investment planning round, but will be put forward as candidates in future planning rounds and will be assessed relative to other priorities at that time.

Comparison of Costs and Benefits

The preceding discussion, in conjunction with details supplied in Appendix II, indicates where expenditure required to meet the proposed SWQOs. This expenditure is necessary in order to ensure that current and future ecological and human uses of the river are protected. As described in Appendix II, the uses most at risk should water quality deteriorate are fisheries, irrigation, river ecosystem, recreation and aesthetics, amenity and tourism. Whilst it is noted that specific costs for improvements within the catchment are not currently available, the importance of the uses outlined above and the benefits of maintaining and, where appropriate improving, water quality and hence protecting these uses is considered to outweigh any costs incurred. The investment required will enable a total of 43 km of river to be protected. Water quality in the remaining 13 km of river, not highlighted as requiring additional investment, will be maintained as a result of ongoing pollution prevention and control measures.

GLOSSARY

Action Plan	A document produced by the NRA as a result of a Catchment Management Plan (ibid). It lists the actions required in the next 5 - 10 years.
Aquifer	Layers of underground porous rock which contain water and allow water to flow through them.
ATU	Allyl Thio-Urea. See Biochemical Oxygen Demand.
Ammonia (or Total Ammonia)	A chemical found in water often as the result of pollution by sewage effluent. Ammonia affects fisheries and abstractions for potable water supply.
AMP2	An acronym for Asset Management Plan, Number 2. These are the plans of the Water Companies for future investment. This expenditure is committed and has been justified as part of the national negotiations with the Water Industry on future charges for water. See also Statutory Expenditure and Discretionary Expenditure.
BOD and BOD(ATU) Biochemical Oxygen Demand	A measure of the amount of oxygen consumed in water, usually by organic pollution (ibid). Oxygen is vital for life so the measurement of the BOD tests whether pollution could affect aquatic animals. The value can be misleading because much more oxygen is taken up by Ammonia (ibid) in the test than in the natural water. This effect is suppressed by adding a chemical (Allyl Thio-Urea) to the sample of water taken for testing. Hence BOD(ATU).
Catchment	The area of land over which rainfall drains to the river.
Catchment management planning	The consultative process by which the Agency plans to meet all the issues in any catchment, and not just water quality and RQOs. It involves the production of a Consultation Report and liaison with local people in forming an Action Plan (ibid). One outcome of the process is draft proposals for SWQOs (ibid)
Classified River or Classified Watercourse	Rivers big enough to be included in the national quinquennial reports on river water quality. Generally these are rivers whose flow is bigger than about 5 million litres per day, though smaller rivers may be included if they are particularly important. Only classified rivers are being considered for SWQOs (ibid), though all rivers can have RQOs (ibid).
Combined Sewer Overflows	Most sewers receive flows of sewage and flows of rainfall that run off our roads and paved areas. After heavy rainfall, the flows in the sewer may exceed the capacity of the sewers or the capacity of sewage treatment works. Combined Sewer Overflows allow the diluted and excess flows to discharge to a receiving water. The conditions under which flows may overflow into receiving waters are specified in the Consent (ibid).
Compliance Assessment	A procedure applied to the results of a monitoring programme to determine whether a water has met its Quality Standards (ibid).
Confidence of Failure	The outcome from compliance assessment (ibid). This might conclude with the statement, for example, that we are 93% certain of failure - the Confidence of Failure is 93%. We are often less than 100% sure of failure because we cannot monitor continuously everywhere.
Consent	A statutory document issued by the Agency which defines the legal limits and conditions on the discharge of an effluent to a water.
Copper	See Dissolved Copper.
CSO	An acronym for Combined Sewer Overflow (ibid)
Cyprinid Fish	Coarse fish belonging to the carp family (roach, dace, bream, etc).
Dangerous Substances Directive	Substances defined by the European Commission as in need of special control because they are toxic, accumulate in plants or animals and are persistent. Subjects of the Dangerous Substances Directive (76/464/EEC).
Directive	A type of legislation issued by the European Community which is binding on Member States in terms of the results to be achieved but which leaves to Member States the choice of methods.
Discretionary Expenditure	A special category within AMP2 (ibid) for expenditure over and above Statutory Expenditure (ibid). Discretionary Expenditure is targeted at meeting a specific national set of environmental improvements.
Dissolved Copper	A metal, toxic to fish.
Dissolved Oxygen	The amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is a test of the health of a river.
Freshwater Fish Directive	A Directive (ibid) that sets water quality standards for rivers designated as freshwater fisheries (78/659/EEC).
Fisheries Directive	The Freshwater Fish (ibid) Directive (ibid) (78/659/EEC).
General Quality Assessment (GQA)	The Agency's way of placing waters in categories according to assessments of water quality based on measurements of BOD, Dissolved Oxygen and Ammonia. Used for the national reporting of trends.
Hardness	A measure of the dissolved minerals in water. Important because this affects the toxicity of Copper and Zinc (ibid).
Invertebrates	Animals which lack a vertebral column. They include, for example, insects, crustaceans, worms and molluscs.

MAFF	Ministry of Agriculture Fisheries and Food.
mg/l	Unit of concentration: Milligrammes per litre.
mg/l CaCO ₃	Unit of concentration: Milligrammes per litre (expressed as Calcium Carbonate).
mgN/l	Unit of concentration: Milligrammes per litre (expressed as nitrogen).
Ml/d	Unit of river flow. megalitres per day - millions of litres per day.
NWC	National Water Council Scheme: classification scheme historically used by the NRA and its predecessors to manage and assess river water quality.
Organic Pollution	A term used to describe the type of pollution which through the action of bacteria consumes the Dissolved Oxygen (ibid) in rivers. It applies to the effects of sewage, treated sewage effluent, farm wastes and the waste from many types of industry like dairies, breweries and abattoirs. The effects of organic pollution are described by the levels of BOD, Ammonia and Dissolved Oxygen (ibid).
Percent Saturation (% saturation)	Unit of measurement for Dissolved Oxygen. The amount of oxygen expressed as a proportion of the maximum which can be dissolved in pure, sterile, water.
Percentile	A level of water quality, usually a concentration, which is exceeded for a set percentage of the time. Hence: 90-percentile (ibid).
pH	A measure of the acidity of water.
90-percentile	A level of water quality, usually a concentration, which is exceeded for 10-percent of the time. Similarly, 95-percentile and 10-percentile.
90-percentile Standard	A level of water quality, usually a concentration, which must be achieved for at least 90-percent of the time. Similarly, 95-percentile and 10-percentile.
Quality Standard	A level of a substance or any calculated value of a measure of water quality which must be bettered. The pairing of a specific concentration or level of a substance with a summary statistic like a 90-percentile (ibid).
River Quality Objective (RQO)	The category of water quality that a body of water should match, usually in order to be satisfactory for use (ibid) as a fishery or water supply etc. Mostly expressed as the River Ecosystem Class.
Salmonid Fish	Game fish of the Salmon Family (trout, salmon, etc).
Site of Special Scientific Interest	A legal designation applied by English Nature/Countryside Council for Wales to land of particular importance for nature conservation.
SSSI	Acronym for Site of Special Scientific Interest (ibid).
Statistically significant	A description of a conclusion which has been reached after making proper allowance for the effects of random chance.
Statutory Expenditure	AMP2 (ibid) expenditure which is mainly aimed at: meeting legal duties, especially those imposed by European legislation. For sewage treatment, it is dominated by the requirements of the Directive on Urban Waste Water Treatment (ibid).
Statutory Water Quality Objective (SWQO)	A Quality Objective given a statutory basis by Regulations made under the Water Resources Act 1991.
STW	Acronym for Sewage Treatment Works.
Surface Water Abstraction (Directive on)	A Directive (ibid) that sets water quality standards for surface waters used, after treatment, as a supply of drinking water to the public (75/440/EEC).
Total Ammonia	See Ammonia.
Total Zinc	A metal, toxic to fish.
Unionised Ammonia	A species of Ammonia (ibid). A small component of the amount of Total Ammonia which is particularly toxic to fish and which therefore has its own standard.
Urban Waste Water Treatment (Directive on)	A Directive (ibid) that sets standards for discharges from sewage treatment works and sewerage systems (and similar discharges). The Directive also sets out the dates by which the standards must be achieved.
Use	Attributes of a river like a fishery or a water supply.
Use-related Objective	An aim to achieve a particular Use(ibid).
Use-related Standards	Water quality standards needed to protect a Use (ibid).
µg/l	Unit of concentration: Microgrammes per litre - one millionth of a gramme per litre.
Zinc	See Total Zinc.

APPENDIX I: PROPOSED SWQOs FOR THE YARROW CATCHMENT

RIVER STRETCH	NAME OF WATERCOURSE	START OF STRETCH	MAP REF	END OF STRETCH	MAP REF	LENGTH OF STRETCH (km)	PROPOSED SWQOs (with date)
1	River Yarrow	Rivington Reservoir	SD621145	Black Brook	SD592162	5.2	RE4(1996); RE2(2006)
2	River Yarrow	Black Brook	SD592162	Chorley STW	SD562172	8.9	RE5(1996); RE4(2006)
3	River Yarrow	Chorley STW	SD562172	Culbeck Brook	SD522181	6.1	RE4(1998)
4	River Yarrow	Culbeck Brook	SD522181	River Douglas	SD466187	7.0	RE4(1998)
5	Syd Brook	Wrightington Bar	SD537133	River Yarrow	SD501179	8.5	RE4(1996); RE3(2006)
6	Culbeck Brook	Woodcock Fold	SD570192	River Yarrow	SD522181	5.7	RE3(1996)
7	River Chor	A6 road bridge	SD583179	River Yarrow	SD567170	2.7	RE3(2000)
8	Clancutt Brook	B5251 road bridge	SD559140	River Yarrow	SD569153	2.6	RE3(1996); RE2(2006)
9	Eller Brook	Leeds/Liverpool Canal viaduct	SD596139	River Yarrow	SD581141	2.3	RE5(1996); RE4(2006)
10	Black Brook	The Goit	SD614191	River Yarrow	SD592163	5.1	RE3(1996)
11	Brinscall Brook	Ministry of Defence Site	SD615203	Black Brook	SD614191	1.5	RE3(1996)

APPENDIX II: SUMMARY OF COSTS, BENEFITS AND ISSUES

RIVER STRETCH 1:							
The proposed SWQO of RE4 (1996) is based on maintaining current water quality. A further longer-term SWQO of RE2 (2006) is also proposed							
PROPOSED COSTS:							
No additional planned capital investment in this stretch in the short term, with the emphasis on at least the maintenance of current quality.							
Achievement of the proposed longer-term SWQO is associated with investment in improvements to the sewerage system, together with remediation of motorway drainage problems and ongoing pollution control investigations.							
BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	Medium	Low
SUBSTANTIVE BENEFITS:							
<p>FISHERIES: The stretch currently supports minor coarse species including stickleback and bullheads plus brown trout. Maintenance of water quality is essential to prevent any deterioration in the quality of the fishery and to encourage more successful spawning.</p> <p>RECREATION: This stretch is accessible to the public via a number of footpaths.</p>							

RIVER STRETCH 2:							
The proposed SWQO of RE5 (1996) is based on maintaining current water quality. A further longer-term SWQO of RE4 (2006) is also proposed.							
PROPOSED COSTS:							
No additional planned capital investment in this stretch in the short term, with the emphasis on at least maintenance of current quality.							
Achievement of the longer-term SWQO is associated with investment in improvements to the sewerage system and ongoing pollution control investigations.							
BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	High	High	Low
SUBSTANTIVE BENEFITS:							
<p>FISHERIES: Maintenance of water quality in this stretch is important in ensuring that the current marginal coarse fish populations are protected.</p> <p>RECREATION: Stretch 2 of the Yarrow is highly accessible to the public, running through the Yarrow Valley Linear Park and Duxbury Golf Course. Maintenance of water quality is necessary to prevent deterioration in this highly accessible part of the river corridor.</p> <p>AMENITY/AESTHETICS: Stretch 2 of the river is in close proximity to existing and planned housing estates and developments. Maintenance of water quality is therefore important in preventing potential adverse effects on property and amenity values.</p>							

RIVER STRETCHES 3 & 4:

The proposed SWQOs are based on preventing deterioration of water quality by the investment detailed below.

PROPOSED COSTS:

Investment planned by NWW Ltd for improvements at Chorley STW.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/ AESTHETICS	TOURISM
	Low	High	High	Medium	High	High	Low

SUBSTANTIVE BENEFITS:

FISHERIES: The investment identified above is necessary to prevent deterioration of the water quality in Stretch 3. In addition the planned STW improvements are necessary to enable the establishment of a viable coarse fishery. This will also be beneficial to Stretch 4 downstream, which is fished by Croston and Bretherton Angling Club, by establishing a new, and enhancing the existing, mixed fishery.

AGRICULTURAL & INDUSTRIAL ABSTRACTION: There are three spray irrigation licences currently operating in Stretch 4. Maintenance of water quality is therefore important in protecting this use. Two licences for farmland at Croston are for abstractions of 14.38 Ml/year and 4.93 Ml/year with one licence at Bretherton for 27.27 Ml/year.

RECREATION: These stretches of the river are accessible to the public via a number of public footpaths and, as mentioned above, are used for recreational purposes by Croston and Bretherton Angling Club. In addition, a proposed extension of the Yarrow Valley Linear Park will incorporate a section of Stretch 3.

AMENITY: Stretch 4 runs through the village of Croston and maintenance of water quality is therefore important in preventing potential adverse effects on property and amenity values.

RIVER STRETCH 5:

The proposed SWQO of RE4 (1996) is based on maintaining current water quality. A further longer-term SWQO of RE3 (2006) is also proposed.

PROPOSED COSTS:

No additional planned capital investment in the short term in this stretch, with the emphasis on at least the maintenance of current quality.

Achievement of the longer-term SWQO of RE3 (2006) is associated with investment in improvements to the sewerage system, remediation of motorway drainage problems, investigation and remediation of farm issues, investigation and remediation of Welch White Colliery spoil tip, together with ongoing pollution control investigations.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/ AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	High	Low

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality in this stretch is important to ensure that the current marginal trout and coarse fish populations are protected.

RECREATION: This stretch of the river is accessible to the public via a number of footpaths.

AMENITY: A number of properties in the villages of Eccleston and Heskin Green are in close proximity to the upper section of stretch 5. Maintenance of current water quality is therefore important in preventing potential adverse effects on property and amenity values in this area.

RIVER STRETCH 6:

The proposed SWQO is based on maintaining current water quality.

PROPOSED COSTS:

No additional planned capital investment in this stretch with the emphasis on at least maintenance of current quality.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	High	Low

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality in this stretch is important to ensure that the current marginal trout and coarse fish populations are protected.

RECREATION: This stretch of the river is accessible to the public via a number of footpaths.

AMENITY: Stretch 6 runs through the village of Euxton. Maintenance of current water quality is therefore important in preventing potential adverse effects on property and amenity values in this area.

RIVER STRETCH 7:

The proposed SWQO for the River Chor is based on preventing deterioration in water quality by investment detailed below.

PROPOSED COSTS:

Investment planned by NWW Ltd on sewerage improvements in line with requirements of the EC Directive on Urban Waste Water Treatment.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	High	High	Low

SUBSTANTIVE BENEFITS:

FISHERIES: The investment identified above is necessary to prevent deterioration of water quality in Stretch 7. In addition, the planned sewerage improvements are necessary to enable the establishment of a viable coarse fishery.

RECREATION: This stretch of river is highly accessible to the public as it runs through Astley Park. The planned expenditure by NWW Ltd on combined sewer overflows will improve the aesthetic quality of the stretch which has been the subject of a number of complaints in the past. Astley Park is accessible to the residents of Chorley (Population 50,000) and is the current site of the Royal Lancashire Show.

AMENITY: A number of properties in the town of Chorley, lie in the vicinity of this stretch and thus maintenance of water quality is important in preventing potential adverse effects on property and amenity values.

RIVER STRETCH 8:

The proposed SWQO of RE3 (1996) is based on maintaining current water quality. A further longer-term SWQO of RE2 (2006) is also proposed.

PROPOSED COSTS:

No additional planned capital investment in this stretch in the short term, with the emphasis on at least maintenance of current quality.

Achievement of the longer-term SWQO is associated with investment in improvements to the sewerage system, investigation and remediation of farm problems, together with ongoing pollution control investigations.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	Low	Low

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality is important in ensuring that the current marginal fish populations are protected.

RECREATION: This stretch of river is accessible to the public via a number of footpaths.

RIVER STRETCH 9:

The proposed SWQO of RE5 (1996) is based on maintaining current water quality. A further longer-term SWQO of RE4 (2006) is also proposed.

PROPOSED COSTS:

No additional planned capital investment in this stretch in the short term, with the emphasis on at least maintenance of current quality.

Achievement of the longer-term SWQO is associated with investment in investigation and remediation of farm problems, and issues associated with tip and disused open cast sites, together with ongoing pollution control investigations.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	Low	Low

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality is important in ensuring that the current marginal fish populations are protected.

RECREATION: This stretch of river is accessible to the public via a number of footpaths.

RIVER STRETCH 10:

The proposed SWQO is based on maintaining current water quality.

PROPOSED COSTS:

No additional planned capital investment in this stretch with the emphasis on at least maintenance of current quality.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/ AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	Low	High

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality is important in ensuring that current marginal fish populations are protected.

RECREATION: This stretch of river is accessible to the public via a number of public footpaths.

TOURISM: Part of this stretch lies within the area of Anglezarke Moor and Wheelton Moor, which are popular tourist location for fell-walking.

RIVER STRETCH 11:

The proposed SWQO is based on maintaining current water quality

PROPOSED COSTS:

No additional planned capital investment in this stretch with the emphasis on at least maintenance of current quality.

BENEFITS	POTABLE SUPPLIES	IRRIGATION	FISHERIES	RIVER ECOSYSTEM	RECREATION	AMENITY/ AESTHETICS	TOURISM
	Low	Low	High	Medium	Medium	Low	High

SUBSTANTIVE BENEFITS:

FISHERIES: Maintenance of current quality is important in ensuring that the current marginal fish populations are protected.

RECREATION: This stretch of river is accessible to the public via a number of footpaths.

TOURISM: This stretch lies within the area of Anglezarke Moor and Wheelton Moor which are popular tourist locations for fell-walking.

APPENDIX III: DIGEST OF RESPONSES TO CONSULTATION

A total number of 220 copies of our document *The Yarrow Catchment: Proposals for Statutory Water Quality Objectives* were issued during the three-month consultation period, which was also supported by a Press release and a public meeting held on the 10th May 1996.

In total, we received over twenty written responses of which some 9 were comprehensive and made particular reference to the SWQO process itself. In addition, several queries arose from the public meeting forum. These are summarised below in Table 3.1. One of the key issues raised was the need to clarify details of the likely benefits and costs associated with proposed investment in water quality schemes.

TABLE 2: RESPONSES AND ACTIONS ARISING FROM SWQO CONSULTATION

No.	Organisation/ Individual	Key Points	Action taken by Agency
1.	NFU	Opposition to statutory targets and cost-benefit issues. Request for risk assessment and full cost benefit analysis. Support for pollution prevention initiatives.	Acknowledgement and improved summary of costs and benefits.
2.	MAFF	Positive support for process of setting realistic SWQOs but query over need for two-tier system. Request for apportionment of identified costs between sectors of industry.	Acknowledgement and improved summary of costs and benefits.
3.	NWW LTD	Need for clearer definition of required investment.	Acknowledgement and improved summary of costs and benefits.
4.	LANCS CC	Positive support for process. Criticism of low benefit category for tourism.	Acknowledgement and improved summary of costs and benefits.
5.	OFWAT (HQ)	Concern over "ratchetting up" of treatment standards to meet SWQOs and potential implication on water charges. Request for more precise estimate of cost implications and query over suitability of highlighted benefits.	Acknowledgement and improved summary of costs and benefits.
6.	OFWAT (Regional)	Concern over "ratchetting up" of treatment standards to meet SWQOs and potential implication on water charges. Request for more precise estimate of cost implications and query over suitability of highlighted benefits.	Acknowledgement and improved summary of costs and benefits.

No.	Organisation/ Individual	Key Points	Action taken by Agency
7&8.	CHORLEY BC (2 written responses)	Issues over references to "contaminated land"; improvements of longer term objectives from RE4 to RE3; importance of tourism.	Acknowledgement, removal of reference to contaminated land, request made for further information particularly in relation to tourism. A specific response was made to comments requesting revisions to long term proposals.
9.	WEST LANCS DC	Positive support for process. Commented on resource restrictions for meeting higher targets.	Acknowledgement.
10.	PUBLIC MEETING COMMENTS	Key issues raised concerned: Fishery benefits, Investment plans, Water Resource issues, non-inclusion of potential consultees on original distribution. The future of SWQOs for other river uses, in particular, water contact sports and concern over reference to contaminated land.	Queries discussed at meeting and improved summary of costs and benefits.

MANAGEMENT AND CONTACTS:

The Environment Agency delivers a service to its customers, with the emphasis on authority and accountability at the most local level possible. It aims to be cost-effective and efficient and to offer the best service and value for money.

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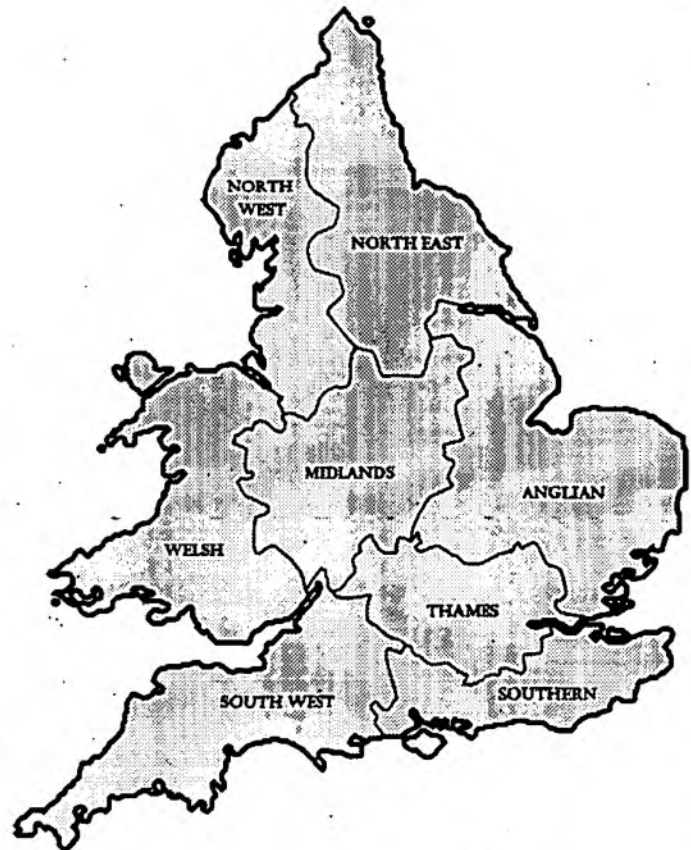
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