

RIVER CATCHMENT PLANNING GUIDELINES REPORT

February 1990



NRA

*National Rivers Authority
Thames Region*

RIVER CATCHMENT

PLANNING GUIDELINES

FEBRUARY 1990

Environment Agency
Information Centre
Head Office

Class No

Accession No *BDEE*

THE NATIONAL RIVERS AUTHORITY

EXECUTIVE SUMMARY

River Catchment Planning is the process by which all the problems and opportunities for enhancement within a catchment can be addressed in an efficient and cost-effective manner. It does not attempt to provide a replacement for the day-to-day functional operations that are currently undertaken by the NRA. These Guidelines propose a framework within which a series of catchment problems may be more adequately overcome.

The process is split into four fundamental phases representing :

- i) The evaluation of the catchment;
- ii) Planning the future for the catchment;
- iii) Implementing the proposed action plans;
- iv) Monitoring and updating the River Catchment Plan.

Each phase is described in a logical sequence of stages (Figure 1) and pointers to the appropriate areas for consultation and liaison are also provided.

The format of the River Catchment Evaluation Report and the River Catchment Plan are specified thereby ensuring that inter-catchment comparisons are readily facilitated.

The policy and legislative considerations are highlighted together with the Corporate and Business Plan implications such that the overall process can be carried out within the existing NRA framework.

One of the major benefits of River Catchment Planning is the medium/long-term savings in NRA resources : working to an agreed plan, many existing tasks will be made more efficient and effective.

The resource implications of the process itself are not addressed since the extent to which the process can be accommodated within the existing NRA structures and the depth of any baseline surveys required will inevitably vary from one Region to another.

The process is designed to be implemented by all Regions and, consequently, it has not been drawn up from a particular Region's viewpoint.

It is acknowledged that, as a result of the varying structural composition of each NRA Region, the areas of responsibility of a particular department will vary from Region to Region. The framework proposed, however, is flexible enough to accommodate such variance and will prove to be relatively easy to implement in practise.

The process differs from those proposed by Welsh Region and Thames region (original version) in the following respects:

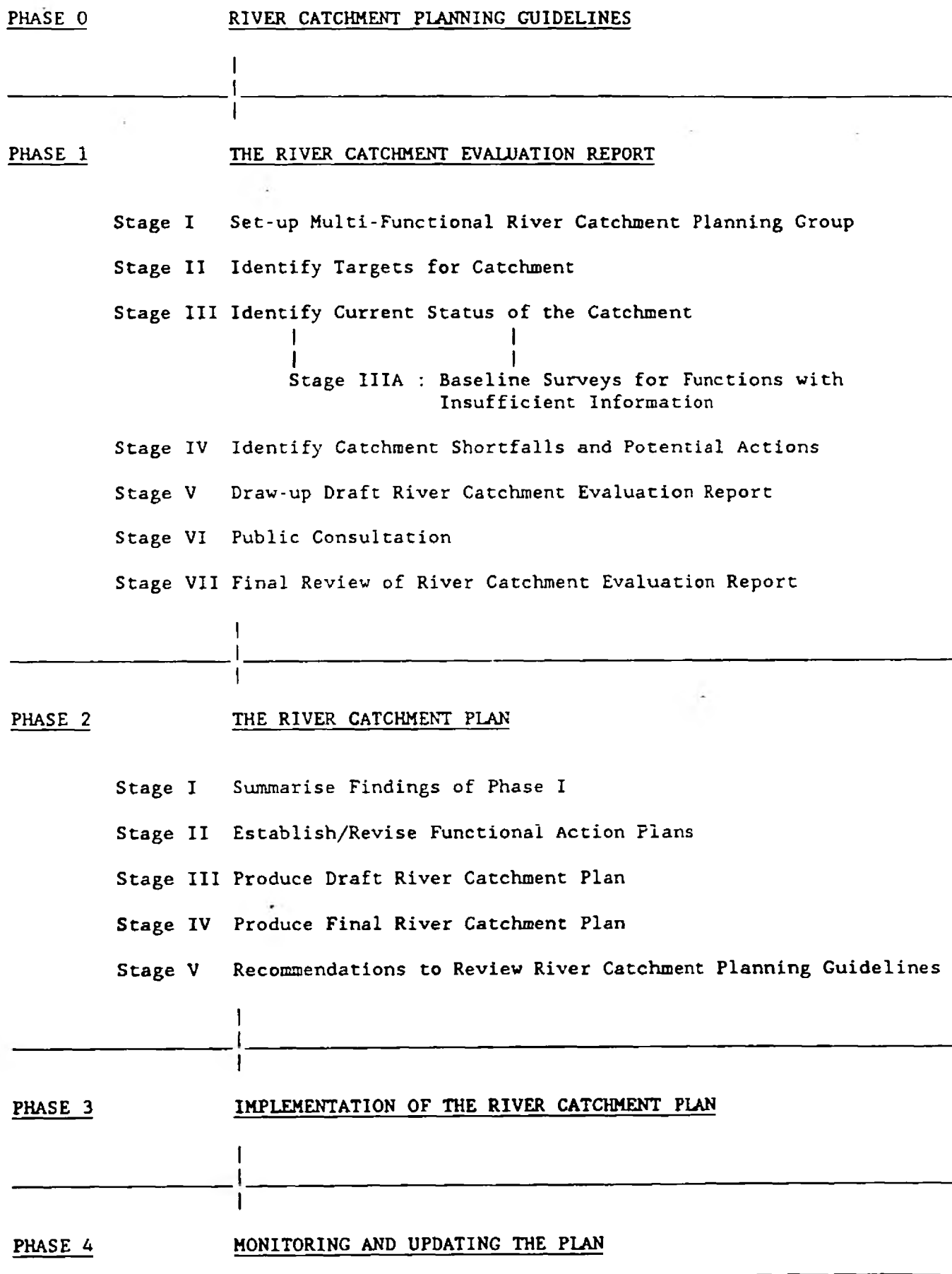
- i) It takes account of all NRA Functions and key issues within the catchment (catchment attributes).
- ii) It does not place more importance on one function than another and allows this relative importance to be assessed on a catchment basis.

- iii) It is written in plain language and is presented in a simple step-by-step format.
- iv) It allows for each Region to operate River Catchment Planning in a form that will be most beneficial to its adopted catchment characteristics i.e. on a sub-catchment or whole catchment basis.
- v) It enables views from both within the NRA and from external bodies to be accounted for.
- vi) It draws on the experience of processes that are already practised within the NRA.
- vii) It highlights areas of possible inter-functional and function/attribute interactions thereby providing an indication of possible resource-saving measures.

The report is designed to be appealing and applicable to all relevant NRA staff irrespective of any day-to-day functional responsibilities.

The overall process, together with the reports and plans that will be produced as a consequence, will enhance the public perception of the NRA (through a coordinated approach to its duties and increased public involvement) as well as solving catchment-based problems and taking advantage of enhancement opportunities.

Figure 1 : Flow Chart of the River Catchment Planning Process



CONTENTS

| <u>CHAPTER</u> | <u>DESCRIPTION</u> | <u>PAGE</u> |
|----------------|---|-------------|
| | <u>EXECUTIVE SUMMARY</u> | i |
| 1 | <u>INTRODUCTION</u> | 1 |
| 1.1 | The NRA and the Aim of this Report | 1 |
| 1.2 | What is River Catchment Planning ? | 1 |
| 1.3 | The Benefits of River Catchment Planning | 2 |
| 2 | <u>THE STRUCTURE OF RIVER CATCHMENT PLANNING</u> | 4 |
| 2.1 | Introduction | 4 |
| 2.2 | Policy and Legislation Considerations | 4 |
| 2.3 | Phase 0 - River Catchment Planning Guidelines Report | 6 |
| 2.4 | Phase 1 - The River Catchment Evaluation Report | 7 |
| 2.5 | Phase 2 - The River Catchment Plan | 7 |
| 2.6 | Phase 3 - Implementation of the River Catchment Plan | 8 |
| 2.7 | Phase 4 - Monitoring and Updating the Plan | 8 |
| 3 | <u>PHASE 1 - THE RIVER CATCHMENT EVALUATION REPORT</u> | 9 |
| 3.1 | Introduction | 9 |
| 3.2 | Report Production Procedure | 9 |
| 3.3 | Format and Content | 14 |
| 3.4 | Liaison and Consultation | 15 |
| 4 | <u>PHASE 2 - THE RIVER CATCHMENT PLAN</u> | 17 |
| 4.1 | Introduction | 17 |
| 4.2 | Report Production Procedure | 17 |
| 4.3 | Format and Content | 19 |
| 4.4 | Liaison Required | 20 |
| 5 | <u>PHASE 3 - IMPLEMENTATION OF THE RIVER CATCHMENT PLAN</u> | 21 |
| 6 | <u>PHASE 4 - MONITORING AND UPDATING THE PLAN</u> | 22 |
| 7 | <u>CONCLUSION</u> | 23 |
| 7.1 | The Need For River Catchment Planning | 23 |
| 7.2 | Phase 1 - Summary | 23 |
| 7.3 | Phase 2 - Summary | 23 |
| 7.4 | Phase 3 and 4 - Summary | 23 |

LIST OF APPENDICES

| | |
|---------------|---|
| Appendix I | Principal Function Profiles |
| Appendix II | Catchment Attribute Profiles |
| Appendix III | Production of River Catchment Evaluation Report |
| Appendix IIIA | Format of River Catchment Evaluation Report |
| Appendix IV | Production of River Catchment Plan |
| Appendix IVA | Format of River Catchment Plan |
| Appendix V | Example Principal Function Analysis Sheet |

1. INTRODUCTION

1.1 The NRA and the Aim of this Report

The setting up of the National Rivers Authority - NRA - has been described by Lord Crickhowell as one of the most important steps towards environmental improvement ever taken by a British-Government. The responsibilities of the NRA reflect the wide range of influences now being exerted upon the riverine environment. Surface water and groundwater management in England and Wales that includes environmental quality, recreation, pollution control, flood defence, conservation and fisheries, is at the centre of the NRA's remit.

The degree of responsibility and areas of remit assigned to other bodies as well as the legislative requirements placed on the NRA are stated in the Water Act 1989 within which the NRA itself was set up.

The aim of this set of River Catchment Planning Guidelines is to describe and formalise the approach to assessing and solving catchment-based problems. It will assist in the following areas.

- i) Identifies a starting point from which data and information may be obtained.
- ii) Illustrates the levels of liaison and consultation required at each stage.
- iii) Highlights the importance of inter-functional cooperation.
- iv) Lays down the process for the production of the various reports and plans.
- v) Provides a format for the presentation of the reports and plans.

It is anticipated that this set of guidelines will be used by the majority of NRA functional staff whose work involves any aspects of the river catchment.

1.2 What is River Catchment Planning?

The riverine environment is increasingly becoming a focus for a variety of passive and (inter)active uses and activities. The NRA is responsible for examining the interaction between such activities/uses and the water/associated land environment, and reconciling any conflicts that may arise. It is generally accepted that the most effective and efficient approach to this management and planning process would be through the production of a River Catchment Plan (RCP).

River Catchment Planning is the process of ensuring that all the problems and opportunities resulting from the demands within a river catchment are presented within a well-defined, and yet flexible framework capable of maximising the overall well-being of that catchment.

River Catchment Planning is inherently multifunctional and represents the amalgamation of both technical and managerial expertise from areas such as :

- i) Conservation
- ii) Fisheries
- iii) Flood Defence/Land Drainage
- iv) Navigation
- v) Pollution Control
- vi) Recreation
- vii) Water Resources
- viii) Water Quality

The basis of River Catchment Planning varies from region to region as well as from catchment to catchment. The approach outlined in this document can be developed to a much greater extent in all regions. Potential areas of interaction between functions and functions/attributes are identified in Tables 1 and 2.

1.3 The Benefits of River Catchment Planning

As has been stated above, the NRA has been set up along functional lines each with a responsibility for particular water-related disciplines. One potential drawback with a structure developed along these lines is a "tunnel vision" approach to catchment problems. River Catchment Planning has at its centre inter-functional co-operation and is, therefore, a vehicle for improved operational activities.

Benefits will also occur at a number of other levels such as improved internal and external communications via the production of the River Catchment Plan itself, through the processing of the data and integrated formulation of conclusions/recommendations, and the related national research and development programme, to the beneficial implementation of the final document.

Specific benefits include:-

- i) improved service to the customer in terms of:-
 - a) speed and quality of response to technical queries (e.g. flood defence, pollution control),
 - b) improved definition of needs, objectives and policies,
 - c) provision of consistent levels of service,

- d) environmental care,
- e) cost effectiveness via balanced capital and revenue expenditure.
- ii) Provision of an Authority aim i.e. achievement of the catchment planning objectives.
- iii) Development of an integrated Authority-wide approach to problems in the catchment (which will naturally support the NRA's statutory obligations).
- iv) Elimination of inappropriate and/or piecemeal solutions to perceived catchment problems.
- v) Improvements in internal effectiveness and efficiency through coordination of information.
- vi) Improved liaison with external interests, thus reducing the likelihood of unforeseen areas of conflict.
- vii) Enhanced consistency and continuity of approach.
- viii) Pro-active identification and prioritisation of investment in Revenue and Capital works in response to levels of service needs.
- ix) Increased influence with those external bodies making policies affecting the NRA's functions.
- x) Improved structure and direction for the national research and development programme.
- xi) A greater degree of environmental protection and enhancement.

The production of River Catchment Plans with a uniform format will allow objective comparison of different catchments with a subsequent improvement in the investment decision-making process.

TABLE I : NRA MAIN FUNCTIONS AND THEIR INTERACTIONS WITH RESPECT TO CATCHMENT PLANNING

| | | NRA FUNCTION | | | | | | | | | | | | |
|------|----------------------------------|--------------|----|----|---|-----|---|----|---|-----|----|-----|----|--|
| CODE | NRA FUNCTION | WQ | PC | WR | F | R/C | C | FD | N | P/C | EP | L/C | PR | |
| WQ | WATER QUALITY | | + | + | + | + | + | | | + | + | + | + | |
| PC | POLLUTION CONTROL | | | + | + | + | + | | + | | + | + | + | |
| WR | WATER RESOURCES | | | | + | + | + | + | + | + | + | + | + | |
| F | FISHERIES | | | | | + | + | + | + | + | + | + | + | |
| R | RECREATION | | | | | | + | + | + | + | | + | + | |
| C | CONSERVATION | | | | | | | + | + | + | | + | + | |
| FD | FLOOD DEFENCE AND LAND DRAINAGE | | | | | | | | + | + | + | + | + | |
| N | NAVIGATION | | | | | | | | | + | | + | + | |
| P/C | STATUTORY PLANNING AND CONTROL | | | | | | | | | | + | + | + | |
| EP | EMERGENCY PLANNING | | | | | | | | | | | + | + | |
| L/C | PLANNING LIASON AND CONSULTATION | | | | | | | | | | | | + | |
| PR | PUBLIC RELATIONS | | | | | | | | | | | | | |

KEY : + - INTERACTION POSSIBLE

TABLE II : CATCHMENT ATTRIBUTES AND THEIR INTERACTIONS WITH NRA FUNCTIONS

| NRA FUNCTION | CATCHMENT ATTRIBUTES | | | | | | | | | | | | |
|----------------------------------|----------------------|-----|-----|-----|------|------|------|------|-------|-----|-------|-----|------|
| | CHEM | M.B | W.U | TOP | GEOM | HYDY | HYDS | L.U. | LANDS | A\H | R.Ow. | EC. | P.P. |
| WATER QUALITY | + | + | + | | + | | | + | | | + | + | + |
| POLLUTION CONTROL | + | + | + | | | | | + | | | + | + | + |
| WATER RESOURCES | + | + | + | + | + | + | + | + | + | + | + | + | + |
| FISHERIES | + | + | + | + | + | + | + | + | + | | + | + | + |
| RECREATION | + | + | + | + | + | + | + | + | + | + | + | + | + |
| CONSERVATION | + | + | + | + | + | + | + | + | + | + | + | + | + |
| FLOOD DEFENCE AND LAND DRAINAGE | | | | + | + | + | + | + | + | + | + | + | + |
| NAVIGATION | | | | + | + | + | | | + | + | + | + | + |
| STATUTORY PLANNING AND CONTROL | | | + | | + | + | + | + | + | + | + | + | + |
| EMERGENCY PLANNING | | | | | | + | + | + | | | + | | + |
| PLANNING LIASON AND CONSULTATION | | | + | | + | + | | + | + | + | + | + | + |
| PUBLIC RELATIONS | | | + | | | | | | + | + | + | + | + |

KEY : + - POSSIBLE INTERACTION

| | | | | | |
|------|---|---------------|-------|---|----------------------|
| CHEM | - | CHEMISTRY | LANDS | - | LANDSCAPE |
| M.B. | - | MICROBIOLOGY | A/H | - | ARCHAEOLOGY/HERITAGE |
| W.U. | - | WATER USE | R.Ow | - | RIPARIAN OWNERSHIP |
| TOP | - | TOPOGRAPHY | EC | - | ECOLOGY/BIOLOGY |
| GEOM | - | GEOMORPHOLOGY | PP | - | PUBLIC PERCEPTION |
| HYDY | - | HYDROLOGY | | | |
| HYDS | - | HYDRAULICS | | | |
| L.U. | - | LAND USE | | | |

2. THE STRUCTURE OF RIVER CATCHMENT PLANNING

2.1 Introduction.

The approach to River Catchment Planning follows a similar format to that already used by Thames and Welsh Regions, and can be represented in the following overview.

Phase 0 - Determination of River Catchment Planning Guidelines

Phase 1 - Evaluate the current status of the catchment through the production of the River Catchment Evaluation Report, and identify options for progress.

Phase 2 - Draw up Action Plans through production of the River Catchment Plan.

Phase 3 - Implement River Catchment Plan proposals.

Phase 4 - Monitoring and updating of the River Catchment Plan.

This overview will be expanded upon in the following sections to provide a framework for River Catchment Planning.

2.2 Policy and Legislative Considerations.

The NRA conducts the majority of its operations in the light of legislation that is both national and international in origin. The Water Act of 1989 consolidated and restated many of these requirements although much of the detail still resides in the original legislation. River Catchment Planning, being interfunctional, will be conducted within the full range of legal requirements.

The following represent examples of the range of legislation applicable to each function and, as a result, also to River Catchment Planning.

a) Water Quality and Pollution Control

i) International

| | |
|---------------------------------|--------------|
| E.C. Directives on : | |
| Surface Waters | - 75/440/EEC |
| Dangerous Substances | - 76/464/EEC |
| Bathing Waters | - 76/160/EEC |
| Shellfish Protection | - 79/923/EEC |
| Groundwater Protection | - 80/68/EEC |
| Water for Human Consumption | - 80/778/EEC |
| Exchange of Information | - 77/795/EEC |
| Freshwater Fish | - 78/659/EEC |
| Environmental Impact Assessment | - 85/337/EEC |
| Oslo and Paris Commission | |

- ii) National
 - Public Health Act 1936 and 1972
 - Water Act 1989
 - Control of Pollution Acts 1974 (Part I) and 1983
 - Food and Environmental Protection Act 1985
 - Salmon and Freshwater Fisheries Act 1975.
 - Town and Country Planning Act 1971
- b) Flood Defence/Land Drainage
 - i) International
 - No International legislation
 - ii) National
 - Town and Country Planning Act 1971
 - Water Acts 1973 and 1989
 - Land Drainage Act 1976
 - Joint Circular 17/82 1982 (non statutory)
 - Statutory Instruments 1199 and 1217 (1988) see (d)
- c) Water Resources
 - i) International
 - E.C. Directives on:
 - Groundwater Protection - 80/ 68/EEC
 - Surface Water - 75/440/EEC
 - ii) National
 - Water Acts 1945 and 1989
 - Water Resources Act 1963
 - Drought Act 1976
- d) Fisheries, Recreation and Conservation
 - i) International
 - E.C. Directives on:
 - Freshwater Fish - 78/659/EEC
 - Shellfish Protection - 79/923/EEC
 - Environmental Impact Assessment - 85/337/EEC
 - ii) National
 - Countryside Act 1968
 - Salmon and Freshwater Fisheries Act 1975
 - Ancient Monuments and Archaeological Areas Act 1979
 - Wildlife and Countryside Act 1987
 - Diseases of Fish Act 1937 and 1983
 - Salmon Act 1986
 - SI 1199 Town and Countryside Planning
(Assessment of Environmental effects)
Regulations 1988
 - SI 1217 Land Drainage Improvement Works
(Assessment of Environmental effects)
Regulations 1988
 - Water Act 1989

In addition to statutory requirements there are policy decisions to be accounted for. These tend to fall into three categories:

- i) Governmental Policies
- ii) National NRA Policies
- iii) Regional NRA Policies

The latter two have yet to be fully developed as the NRA is still in the process of determining the appropriate approaches.

However, Governmental policies have a significant influence on some areas of NRA duties. An example of this is the Ministerial declaration following the Second International Conference on the Protection of the North Sea. This stated that it was intended to reduce the levels of "Red List" substances entering the North Sea by "around 50%". Since many of these substances are discharged along the entire length of many catchments their intended reduction is truly an area for a catchment planning approach.

River Catchment Planning can, therefore, be seen to assist the NRA in meeting its statutory obligations and their policy implications in an effective manner.

2.3 Phase 0 - River Catchment Planning Guidelines Report

This report is dynamic in nature since its contents will be constantly updated in the light of experience gained from the River Catchment Planning process.

Its purpose, however, is to assist the process of River Catchment Planning by setting out a flexible framework. It serves the following purposes.

- i) Outlines the need for River Catchment Planning.
- ii) Highlights the policy and legislation relating to River Catchment Planning.
- iii) Describes the structure required for such planning.
- iv) Lists the criteria by which a catchment may be assessed.
- v) Identifies the catchment attributes and principal functions.
- vi) Identifies the uses to which water may be put.

It also aims to identify the most sensible formats for subsequent report production and these follow in succeeding sections.

It is set out in such a way as to be easily understood by all interested parties.

2.4 Phase 1 - The River Catchment Evaluation Report

This report and its production will provide a comprehensive guide to the status of the catchment under study. It will comprise the following information:-

- i) Identification of the significance of all catchment functions (NRA) and attributes.
- ii) Identification of objectives.
- iii) Identification of standards.
- vi) Identification and evaluation of existing information.
- v) Further baseline survey information if necessary.
- vi) Determination of levels of service.
- vii) Identification of areas of shortfall.
- viii) Outline proposals for actions.
- ix) Areas requiring public consultation.

The report will serve to record the problems and opportunities within the catchment. The evaluation must, therefore, be thorough in all functions and enable any action plans to be drawn up.

The report will include financial information detailing the resources required to progress toward the River Catchment Plan.

2.5 Phase 2 - The River Catchment Plan

The successful completion of the catchment evaluation will prompt the production of the River Catchment Plan. This report will outline the areas of work and investment the NRA has scheduled in order to maximise the well-being of the catchment. The report, together with the process by which it is produced, will comprise the following:-

- i) Summary of Phase 1.
- ii) Detailed Functional Action Plans.
- iii) Summary integrated action plan.
- iv) Recommendations for revision of River Catchment Planning Guidelines.

The format will be reasonably flexible although it is anticipated that it should follow, in essence, that of the River Catchment Evaluation Report.

2.6 Phase 3 - Implement Proposals

An integral component of the planning process is the effective management of the catchment. This involves the implementation of the Action Plan detailed through Phase 2 of the process. The implementation is anticipated as being carried out at a functional level with the success or lack of being assessed by the River Catchment Planning Team.

2.7 Phase 4 - Monitoring and Updating of the Plan

The whole process of River Catchment Planning is seen as an iterative one and will necessitate a periodic review. This review will involve recommendations both to the River Catchment Evaluation Report and the River Catchment Plan.

3. PHASE 1 - THE RIVER CATCHMENT EVALUATION REPORT

3.1 Introduction

The initial stage of the River Catchment Planning procedure will always involve the selection and subsequent evaluation of a river catchment. The importance of this stage must not be overlooked since incorrect decisions at this point may well prove costly both in financial terms as well as in staff effort.

As stated above the evaluation report will serve as a record of the problems and opportunities within the catchment under study. The evaluation must, therefore, be a thorough summary of all functions and attributes to enable an integrated action plan to be drawn up.

The effort required to produce an evaluation report will reflect the scope, depth and quality of the existing information.

The effects of proposed activities or developments are, at present, quantified by undertaking environmental assessments, usually in response to statutory requirements. The preparation of the River Catchment Evaluation Report may be greatly assisted by information already available from the environmental assessments of previous projects or schemes. By the same token the report itself will also provide invaluable information for future environmental assessments within the catchment.

3.2 Report Production Procedure

The stages involved in Phase 1 will inevitably vary from one catchment to another but a list of the most common stages is presented in Appendix III, together with a simplified format of the Report itself (Appendix IIIA).

3.2.1 Stage I - Set-up Multi-Functional River Catchment Planning Group

If the River Catchment Planning process is to be a successful one, there must be full interfunctional co-operation. A multi-functional River Catchment Planning group should, therefore, be set up ensuring that its composition will provide adequate managerial and technical support to the planning/managerial process.

3.2.2 Stage II - Identify Targets for Catchment

Each function should be able to carry out a similar series of tasks with the aim of determining the long-term and short-term targets for the catchment.

The relative importance of each function within the particular catchment should be determined since, in many cases, a single function such as flood defence, water quality or water pollution control may well prove to be more significant than the remainder. This may also shape the procedures followed for consultation and liaison amongst others.

The importance of each catchment attribute should also be identified, and this may be achieved by obtaining data in line with the recommendations in the Evaluation Report and structuring the conclusions.

The target levels of service for each function and potential for each catchment attribute should then be identified. These should consider the financial implications of setting levels of service that are either too high or too low. The latter may well be of importance since levels of service may have to be raised substantially higher in the future to overcome worsening problems. This scenario could possibly outweigh the disadvantages of initially setting high target levels of service.

Each function should identify the potential users and uses made of the catchment. These may range from polluters (water pollution control), discharges (water quality), abstractors (water resources) to constructors (flood defence) and fishing clubs (fisheries). This stage should precede consultation with relevant bodies such as :

NCC, RSPB, CPRE, County Trusts for Nature Conservation, etc

Local Authorities

Riparian Owners etc.

to determine the extent of catchment useage and proposed change.

Corporate objectives will also need to be stated as they will almost certainly have an underlying control on the overall process.

The objectives that will be required to maintain and enhance the previously identified uses may then be set out in some detail e.g:-

- i) Water protection zones to prevent contamination of groundwater.
- ii) Planning constraints within a specified area of the catchment.
- iii) River Quality Objective of 1B to promote salmonid fish.

The standards that may be applied to ensure compliance with the above objectives can then be determined such that they are then enforceable if required.

E.g. Biochemical Oxygen Demand \leq 5.0 mg/l for a class 1B river.

The targets may then represent the summary of all uses, objectives, and standards identified by each function for the particular catchment.

3.2.3 Stage III - Identify Current Status of Catchment

The status of the catchment can be identified within the same framework as that in which the objectives were determined.

Public consultation would be required since, in many cases, localised problems are often more apparent to local residents than to the

Authority. The current uses may then be assessed against the potential uses. The opportunities for enhancement of the catchment attributes will also be determined at this stage.

E.g. Water Quality - agricultural abstraction - class 3

target - salmonid fishery - class 1B

Flood Defence - annual flooding of non-residential property

target - lower frequency of flooding on land perhaps by setting a 1 in 50 year standard of Urban flood protection.

These uses may then be assessed against the objectives and standards that have been designed to protect the target uses and the degree of compliance/non-compliance with each standard/objective should then be apparent.

A risk assessment for these relevant functions should then be carried out to identify those areas for which data indicates little or no problem, but which may give cause for concern in the future.

E.g. pollution from road runoff
flood vulnerability of new built environments

The current levels of service within each function must also be assessed against the previously identified target levels. This will determine whether a shortfall is the cause of the problem within the catchment

E.g. fish mortality due to water quality objectives having been set too low.

It is at this stage that any information deficiencies will need to be identified.

In cases where the information for a particular function is insufficient to provide an evaluation of the catchment status, two possible options are available:

- A. Stage IV (described in section 3.2.4) may be completed for those functions where information is sufficient for the purposes of evaluation. In parallel to Stage IV a baseline study proposal should be produced (Stage IIIA) (to include approach, resources, timescale) and implemented for the function with deficient information. This approach will ensure that a comprehensive River Catchment Evaluation Report is produced albeit on a longer timescale (as a result of the baseline study).
- B. If it is evident that the information deficiency is capable of delaying the River Catchment Planning process significantly, a potential action plan for that function could be identified as 'A need for further information'. This may appear to be an extreme case, but in catchments where this function is perhaps of less importance than others, it may not be prudent to delay the production of the River Catchment Plan as a

result. One possible problem with this approach is that the evaluation process (Phase I) will need to be repeated after the information deficiency has been remedied. However, if the function is indeed of less importance within the catchment then this concern is removed.

Since the two possibilities require differing timescales and possibly resources, the River Catchment Planning Group must decide which of the two options will be of most benefit to the River Catchment Planning process.

3.2.4 Stage IIIA - Baseline Surveys for Functions with Insufficient Data.

As described above this stage may operate in parallel to Stage IV, below, for those functions with insufficient data. Stage IV would then concentrate on those functions that would not require any surveys.

A report will be required outlining the following:

- i) Extent of information shortfall;
- ii) Programme for baseline survey;
- iii) Resource implications of survey;
- iv) Implications of "do nothing" approach;
- v) Implications of acting upon insufficient information.

The report should form the basis of a submission for resource approval.

The baseline survey should then be undertaken (assuming resource approval) and on completion the process should return to Stage III for that function.

3.2.5 Stage IV - Identify Catchment Shortfalls and Potential Actions

Initially this stage is simply an assessment of the data and information arising from Stage III against the targets identified in Stage II. The output from this stage should highlight all the areas where current status is below the potential identified in the targets. Such areas should then be assessed with respect to catchment importance so that any actions/investment decisions can then be prioritised.

Possible actions must then be drawn up to account for the identified problems and opportunities. Since in many cases, there will be more than one possible solution to any particular problem a range of actions should be drafted in order that their relative merits may be assessed by the multi-functional team; this stage is the critical one for integrated River Catchment Planning as functional interactions will become essential.

3.2.6 Stage V - Draw-up Draft River Catchment Evaluation Report

The majority of information and data collation will have been accomplished by this stage. The report detailing the results of Stages

I to IV of the Phase 1 River Catchment Evaluation Report should then be produced in accordance with a format laid down in the River Catchment Planning Guidelines Report. This will ensure that the relative status of a range of catchments may be easily identified through simple report comparison.

The report must always be subjected to a thorough internal review in order that any poor perception of the report may be avoided.

The review should be undertaken by all functional representatives on the River Catchment Planning Group and should consider all functional returns and not just their own functional interests. This step has the advantage of identifying further areas of overlap both in resource terms as well as functional responsibility.

3.2.7 Stage VI - Public Consultation

The NRA takes pride in being seen as the "Guardian of the Water Environment". Public consultation must play a significant role in River Catchment Planning if the NRA is to be seen to be accountable to the public. Statutory bodies have significant interactions with many NRA functions, and should always be consulted prior to the general public.

Besides the "political" aspect of public consultation, this stage does serve another purpose. In many respects, as stated above, the general public has better local knowledge than NRA staff. As a consequence, to avoid such consultation would be to overlook a significant informed body of opinion and a useful source of information.

Also, there is increasing evidence that the viability of say, environmental enhancement measures is greatly increased by involvement of local residents, so early consultation is likely to stimulate a positive and helpful response.

The results of the consultations should be summarised for inclusion within the final version of the River Catchment Evaluation Report. The summary should include an assessment of the success or otherwise of the consultations themselves (communication links may require reviewing at this stage).

The options can then be assessed internally and must take account of the following:-

- i) Public perception of actions
- ii) Environmental benefits/disbenefits of actions
- iii) Financial benefits/disbenefits of actions.
- iv) Implications for Levels of Service.

It would seem appropriate that should i) and ii) be beneficial, a reasonably strong case would have to be made if rejecting the action on purely financial grounds.

3.2.8 Stage VII - Final Review of River Catchment Evaluation Report

Following the internal review and effective external review through public consultation, the final stage may be approached in two ways. Firstly, and the most likely, is to attempt Stages IV and V again in the light of the reviews. Alternatively if the draft report still adequately describes the current status of the River Catchment then it can be adopted as the final version and, thereby instigate Phase 2 of the River Catchment Planning Operation (see Chapter 4).

3.3 Format and Content

The River Catchment Evaluation Report must follow a defined format since, as described earlier, intercatchment comparisons will be made significantly easier as a result. The schematic format is presented in Appendix IIIA to facilitate such comparisons.

In general the format of data presentation used in the Evaluation Report is accepted by many regions. A double page format of descriptive text faced on the opposing page by a map illustrating the extent and detail of the information is both appealing to the eye as well as being informative. This approach is followed for all the principal functions and the catchment attributes. Each function or attribute will have two pages of text with two relevant maps, one highlighting the targets, sensitivities or enhancement opportunities while the other will show the current catchment status. The current levels of service within each function must also be assessed against the target levels of service in order to determine whether a discrepancy in this area is the cause of the problem within the catchment. For attributes such as land use and water use the format may need to be extended in order that the large amount of information may be accommodated.

The Evaluation Report will be set out as follows:

3.3.1 Part 1 - Executive Summary

This summary should provide an overview of the Evaluation Report as a whole. It must not be of a technical nature since it should be of use to the layman as well as to NRA staff.

3.3.2 Part 2 - Introduction

This section must adequately describe the following three areas. Firstly it must outline the NRA's role within the water environment. Secondly it must address the aims, objectives and methods of River Catchment Planning. (These first two issues may easily be standardised for all reports). Finally, it must also include an overview of the catchment. This should provide an indication of the location, with respect to the region, population distribution, brief summary of the catchment's history and the key issues within the catchment.

3.3.3 Part 3 - Data Presentation and Catchment Evaluation

This section will present the analysis sheets , an example of which is presented in Appendix 5, for all principal functions and catchment attributes. These will detail the objectives, targets, standards and current status for the catchment.

3.3.4 Part 4 - Catchment Status

This summary should include the major findings of Part 3 above. It is anticipated that the summary should be less than half of one page for each finding and will provide an "at a glance" identification of the key issues and opportunities for enhancement.

3.3.5 Part 5 - Outline Action Plans

This section should outline the possible options for remedial action to overcome the problems and to achieve opportunities for enhancement listed in Part 4. There is a need for the format to be fixed such that a set of remedial actions may easily be associated with the relevant problems described in previous sections.

3.3.6 Part 6 - Conclusion

The final part will conclude the River Catchment Evaluation Report and invite the interested parties to make relevant comments.

In the case of the final version of the report this section should make any recommendations necessary for the implementation of Phase 2 (see Chapter 4).

3.4 Liaison and Consultation

The primary need for liaison and consultation activities in the River Catchment Planning process is to ensure that consensus is achieved both internally and externally. This philosophy must be central to all phases of the process of producing the River Catchment Plan.

The multi-functional River Catchment Planning Group should assess the degree of consultation within each function such that the appropriate degree of external input is achieved. The following bodies are provided as an example of the range of consultation required:-

- Local and County Councils
- Sewerage and Water Undertakers
- Riparian Owners
- Local Residents
- MAFF/ADAS
- NCC
- DOE
- HMIP
- MOD
- Harbour Authorities
- Forestry Commission

National Union of Farmers
Countryside Commission
National Trust
English Heritage
Angling Clubs
British Waterways Board
Meteorological Office
CPRE
RSPB
RSNC/County Trusts
CLA
Ramblers Association
Environmental Health Officers

In certain catchments where some of the external bodies have a large interest in the production of the River Catchment Plan it may be beneficial for a representative to attend meetings of the River Catchment Planning Group on an 'ad hoc' basis.

The above consultations will achieve, amongst others, the following aims:-

- i) To identify key issues.
- ii) To resolve areas of conflict.
- iii) To create awareness of River Catchment Planning benefits.
- iv) To create awareness of the NRA.
- v) To develop specific catchment policies.

Obviously liaison and consultation activities will not be limited to formal meetings. On a day-to-day basis those responsible for developing the River Catchment Evaluation Report will ensure that appropriate links are maintained with both internal and external interests as necessary. Indeed, the only way of achieving the aims of River Catchment Planning will be to maintain regular contact with those associated with the catchment.

4. PHASE 2 - THE RIVER CATCHMENT PLAN

4.1 Introduction

Phase 2 will, in effect, be completed when a final action plan has been drawn up and agreed by all concerned with the catchment. The production of this plan is of great importance if problems and opportunities are to be effectively and efficiently addressed.

Although it is not possible within this set of Guidelines to detail fully the contents of the final plan, the process by which it may be produced has been defined.

This document must not be viewed in isolation - rather in conjunction with the River Catchment Evaluation Report as part of one continuous process.

The process of River Catchment Planning, as stated above, is an iterative one. The River Catchment Plan will be periodically updated in the light of new information. Consequently, a coherent and continuous approach will be essential if catchment improvements (as well as the relative benefits of differing remedial actions) are to be assessed.

4.2 Report Production Procedure

This section will detail the steps required to produce the River Catchment Plan. These are listed, together with a simplified format of the Report itself, in Appendices IV - IVA.

As has been stated previously, this report is an extension of the Phase 1 report and the initial stage reflects this fact.

4.2.1 Stage I - Summarise Findings of Phase 1

The first stage in the production of the plan involves summarising the findings of the River Catchment Evaluation Report. This will enable all subsequent details to be placed in the correct perspective. This will, in effect, provide a basis for the terms of reference for Phase 2.

4.2.2 Stage II - Establish/Revise Functional Action Plans

Once the preferred options have been chosen, the detailed remedial action plans may be drawn up. These plans will form the basis of the technical annexes to the overall River Catchment Plan and will provide significant levels of detail with respect to:-

- i) Technical aspects.
- ii) Financial aspects.
- iii) Timescale.

In essence the remedial action plans represent extracts from the individual functional plans.

The multi-disciplinary team will draw together the individual functional plans ensuring that all overlaps are identified.

An assessment of the benefits of the Action Plans will also be required. This should identify:-

- i) Future target compliance.
- ii) Degree of risk reduction.
- iii) Any increase in level of service.

4.2.3 Stage III - Produce Draft River Catchment Plan

The draft River Catchment Plan may then be produced. It should summarise the individual action plans as well as indicating any areas of overlap. The format for the plan output is identified in Appendix 4.

Following the production of the draft River Catchment Plan it should be reviewed internally by representatives of each function who are not members of the River Catchment Planning Group, wherever possible, thereby providing an independent audit.

The recommendations of the draft plan should be assessed against the national and regional corporate and business plans. If the process of River Catchment Planning is undertaken by a truly multi-functional River Catchment Planning Group with significant managerial expertise, the plan should comply with the aforementioned plans. If this is not the case then the River Catchment Plan would have to be redrafted.

The draft River Catchment Plan should also be made available to external parties. This consultation should be reasonably brief, since, if appropriate liaison has been undertaken in previous stages, the Plan should reflect all external views.

4.2.4 Stage IV - Produce Final River Catchment Plan

The final plan may now be produced and distributed to all concerned parties ensuring that all previously consulted parties are included in such a distribution.

4.2.5 Stage V - Recommendations to Review River Catchment Planning Guidelines

The final stage is also of great significance since, if the NRA is to be seen as flexible and adaptable, it must be able to review its own guidelines in the face of new information. The River Catchment Planning Guidelines will then be reviewed in the light of all data, information, targets, consultations, actions and new legislation since the previous review. Clearly, such a review will not follow every plan completion, but will be an important routine discipline of perhaps annual frequency in the early years.

An important characteristic of the plan will be its flexibility; time brings change in perception, values, knowledge and techniques, and River Catchment Plans must keep abreast of such changes. It may prove necessary and convenient to review the plan at the same time as a local authority plan review, or indeed more frequently in the light of major developments such as new E.C. legislation. Whilst it is extremely difficult to provide a timescale for review, the dynamic and iterative nature of River Catchment Planning will inevitably dictate it.

4.3 Format and Content

In keeping with all other documents in the River Catchment Planning process, the format of the River Catchment Plan will be reasonably flexible. However, the double page approach used in the River Catchment Evaluation Report would also be appropriate for the plan.

4.3.1 Part 1 - Executive Summary

The initial commentary should be an Executive Summary. As stated earlier, this is of particular benefit to less technical readers and it also has the advantage of being a concise statement capable of being distributed to a wider audience than the plan itself.

4.3.2 Part 2 - Introduction

The introduction will serve two purposes. Firstly it will enable the reader to achieve a degree of understanding by reading the plan in isolation to the evaluation report. Secondly it will provide a concise summary of the findings of the Phase 1 evaluation report. It will have the following components.

- i) description of the NRA's role
- ii) definition of catchment planning
- iii) overview of the catchment
- iv) summary of the Phase 1 (possibly Phase 1 Executive Summary)
- v) public perception of Phase 1.

4.3.3 Part 3 - Action Plans

The master plan should then be detailed.

This will represent a less technical version of the individual remedial action plans and should provide the following:-

- i) technical information
- ii) financial information
- iii) environmental benefits

- iv) cross references to business and corporate plans
- v) increase in target compliance
- vi) estimates of reduction of risk

4.3.4 Part 4 - Summary

This should summarise the above information. The summary should take such a form that readers of a less technical disposition will be able to gain an insight into how the NRA will attempt to solve the problems of the catchment and take advantage of opportunities.

4.3.5 Part 5 - Recommendations

As stated earlier, the River Catchment Planning process is an iterative one and this section will propose appropriate improvements that, at a later date, may be incorporated within the River Catchment Planning Guidelines.

4.4 Liaison Required

The process of liaison and consultation at this stage of the plan production will inevitably follow those lines of communications established during earlier stages. It is important to note the following points, however;

- i) All previously consulted bodies must receive the final copy of the plan.
- ii) All functions within the NRA including those with responsibility for corporate and business plan coordination must be involved.
- iii) In the event of recommendations being made with respect to the amendment of the River Catchment Planning Guidelines, all other Regions of the NRA together with Head Office must also receive a copy of the final report.
- iv) If the NRA is to benefit in the future from helpful and undoubtedly resource saving liaison, this process must be undertaken in an agreed, coordinated and effective manner.

5. PHASE 3 - IMPLEMENTATION OF THE RIVER CATCHMENT PLAN

Following the successful completion of the River Catchment Plan the participating functions must then implement all the relevant proposals within the appropriate timescale. This implementation will be monitored by the River Catchment Planning Group although the effectiveness of the technical components will only be assessed by the individual functions themselves.

The implementation of the proposals will inevitably vary from one region to another as well as from catchment to catchment and, as such, this set of guidelines does not attempt to formalise the approach to this phase.

6. PHASE 4 - MONITORING AND UPDATING THE PLAN

An important component of the whole process of River Catchment Planning is the monitoring and updating of the plan itself. The plan must be monitored for its appropriateness and comprehensive nature and, in the event of it proving to be out of date, it must be updated. It is inevitable that some catchments will change in characteristics more quickly than others and, as such, the period for updating each plan cannot be standardised.

It is anticipated that the River Catchment Planning Group responsible for the Evaluation Report and the River Catchment Plan will also monitor the state of the catchment and, when appropriate, initiate the planning process to update the River Catchment Plan.

7. CONCLUSION

7.1 The Need for River Catchment Planning

It is evident from the principal function and catchment attribute profile sheets already prepared that there is a genuine and very important requirement for an integrated approach to solving catchment based problems.

The River Catchment Planning process will ensure that the NRA protects the environment and promotes enhancement opportunities.

If for no other reason than public perception, the NRA must be able to exhibit an adaptable and flexible approach to such problems. The procedures set out in this report provide a framework that is designed to be utilised by all NRA main functions. In this respect alone it may assist in reducing areas of overlap in the NRA's management.

7.2 Phase 1 - Summary

The investment decision making process is enhanced by the provision of comprehensive and adequate evaluations of the identified problems. Phase 1 - The River Catchment Evaluation Report, is designed to enable the NRA to make effective and efficient investment decisions and to target resources more effectively.

There may be many occurrences where catchment information is stored within the various NRA main functions. The approach to developing the Phase 1 report will ensure that, as a result of full inter-functional cooperation, all such information is collated and effectively utilised.

7.3 Phase 2 - Summary

Following the successful determination of a catchment's status and identification of resources to overcome any shortfalls, there is a need for more detailed remedial action plans to be drawn up. The River Catchment Plan is designed to summarise and bring together the technical information in three forms. Firstly, the technical (with supporting financial and environmental information) detail will be provided in the Action Plans. Secondly, a less detailed presentation will be made in Part 3 of the River Catchment Plan itself. Finally Part 4 of the same report will be structured such that the non-specialist may be provided with some indication of the actions required.

7.4 Phase 3 and 4 - Summary

The completion of this iterative process involves the implementation of the action plans by each function. The monitoring of the process will ensure that any updates to the River Catchment Plan can be made effectively.

APPENDIX I
PRINCIPAL FUNCTION PROFILES

CONSERVATION
CONSULTATION AND LIAISON
EMERGENCY PLANNING
FISHERIES
FLOOD DEFENCE/LAND DRAINAGE
NAVIGATION
PUBLIC RELATIONS
RECREATION
STATUTORY PLANNING AND CONTROL
WATER POLLUTION CONTROL
WATER QUALITY
WATER RESOURCES

Definition : The Authority is responsible for promoting the Conservation of the natural beauty of both inland and coastal waters, of the land associated with such waters and the flora and fauna of the catchment.

Interactions : The many influences being exerted upon the environment dictate the range of interactions required by the Conservation function. An important area of this function involves the environmental assessment of any proposed changes in Water Use and/or Land use. Examples of the interactions are outlined below.

- i) Flood Defence/Land Drainage works may require Conservation measures if the Ecology/Biology of the catchment is to be preserved and promoted.
- ii) Changes in Water Quality, perhaps through Water Pollution incidents, may have a disastrous effect upon the environment and Conservation techniques may be required to restore the catchment to its original state.
- iii) The ability of a river to self-purify and thereby protect Water Resources is often dependent upon the Conservation work carried out within the catchment.

Extent : Some of the basic requirements for the RCP are outlined below.

- i) Identification of areas where Conservation and Landscape work has been undertaken.
- ii) The programme for future Conservation and Landscape work.
- iii) Conservation and Landscape work being carried out by external bodies.
- iv) An assessment of the current wildlife status of the catchment eg. species diversity and numbers of individuals and of the Landscape value of component parts of the catchment.

Initial Sources: Examples of the sources of information and points of contact are as follows:

Fisheries, Recreation and Conservation Sections of the NRA
Relevant external groups - eg. NCC, RSPB.
Routine water sampling staff of the NRA
General Public
Regional Rivers Advisory Committee

Definition : It is the Authority's policy to involve relevant statutory authorities, interest groups and members of the public with proposals through an ongoing programme of Consultation and Liaison.

Consultation and Liaison is important at three stages although it must be undertaken on a more-or-less continual basis.

- i) Initially to inform and to understand any issues of concern.
- ii) Once proposals are formulated these need to be tested prior to finalisation.
- iii) Final approval.

Interactions : Consultation and Liaison is an important element of the River Catchment Planning process.

- i) To avoid misunderstanding and confrontation which causes delay and wasted resources.
- ii) To take on board environmental and public aspirations during the RCP formulation.
- iii) To obtain information relating to the NRA's functions but held outside the NRA.

This function will have enormous benefits for those other functions that undertake it in a coordinated and open-minded approach.

Extent : Some of the basic requirements for the RCP are outlined below.

- i) Contact Local Authorities, statutory bodies, key interest groups, major landowners and the general public to explain the objectives of the RCP.
- ii) Identify the potential uses and users of the catchment.
- iii) Obtain views on the issues of concern raised by the River Catchment Evaluation Report.

Initial Sources: The sources of information are numerous but examples are :
Local Authorities
General Public
Interest Bodies eg. NFU, RSPB, angling clubs
Statutory bodies eg. MAFF/ADAS, NCC
All sections of the NRA

Definition : The main objective of this function is to disseminate information on the risk of flooding and pollution and to prepare contingency plans. In conjunction with Flood Defence/Land Drainage this would develop and maintain emergency procedures and security arrangements for the various stages of potential flooding situations. In conjunction with Water Pollution Control, Water Quality, Water Resources and Fisheries functions this area would develop strategic plans for minimising the risk and effects of pollution within a catchment.

Interactions : The Authority is involved both in planning for the mitigation of damage by flooding and pollution as well as the management of actual flooding and pollution events. Such activities involve comprehensive Consultation and Liaison with various bodies. Individual events may involve the coordination of several areas of interest and responsibility of the Authority.

Extent : Where appropriate the RCP will contain the items outlined below.

- i) References to the Emergency Planning procedures for both Flood Defence/Land Drainage and Water Pollution Control.
- ii) An assessment of additional information (and its collation if readily available) to assist in the provision of Emergency Planning procedures eg. location of culverts and known blockage points.
- iii) Flood and pollution risk assessments of certain key areas within the catchment eg. risk of traffic accident releasing chemicals onto a road close to a watercourse.

Initial Sources: Examples of the sources of information and points of contact are as follows:

Water Quality Sections of the NRA
Water Resources Sections of the NRA
Water Pollution Control Sections of the NRA
Flood Defence/Land Drainage Sections of the NRA
Water and Sewerage Undertakers
Emergency Services
Fisheries Sections of the NRA

Definition : The Authority has a responsibility to protect and develop fisheries. In addition the Authority sets target times for fish rescues, set internal standards for fish biomass, prevents illegal fishing and enforces rod licences and byelaws. Disease control, stocking control, design/construction of fish passes and general fisheries conservation are also amongst the responsibilities of this function.

Interactions : An ongoing programme has been established to survey the fish populations of all the major rivers. The plan is to look at all waters at least every 5 years to identify changes and to initiate action where fish populations are found to be distressed. In monitoring changes Fisheries interact with Water Quality, Water Pollution Control, Water Resources, Flood Defence/Land Drainage. The Consultation and Liaison with angling clubs etc. with relation to disease control, stunting and restocking is also an important part of the Fisheries function.

Contact with the customer is made through the Regional Fisheries Advisory Committee as well as angling clubs, consultative organisations and riparian owners.

The Chemistry of the water, discharges and runoff is extremely important in the preservation and promotion fish stocks.

The Microbiology (bacteria and viruses) of the water may be responsible for many diseases in fish.

Extent : In the context of the RCP the initial requirements are likely to be:

- i) assess the type of river (with reference to the freshwater fish directive) eg. salmonid or cyprinid.
- ii) gather information on existing and proposed fisheries surveys.
- iii) map locations of fish passes, spawning sites etc.
- iv) record fishery ownership and tenancy for both rivers and enclosed waters.
- v) liaise with interested parties over collection of information.

Initial Sources: Information may be obtained from :

Fisheries Sectors of the NRA
Regional Fisheries Advisory Committee
Angling Clubs and Riparian Owners

Definition : The Authority has permissive powers under the Land Drainage Act of 1976 to carry out the following :

- i) To maintain and improve existing works and construct new works required for flood defence.
- ii) To control and regulate the flow of water into and out of a channel.
- iii) To provide warnings of floods within the catchment.

The Authority will quantify the effects of new works and improvement measures by undertaking environmental assessments

Interactions : In undertaking major capital works the Authority has to ensure that all factors that might affect, or be affected by such works are taken into account. This will necessitate interactions with most other functions (eg. Water Quality, Water Resources, Recreation and Conservation)

The control of water levels are important to Navigation, Water Quality, Water Resources and Fisheries.

Eg. Low flow problems for abstraction, fish and navigation.

Decreased capacity for effluent dilution.

Public Relations will be influenced by the extent and speed at which flood warning and monitoring information is distributed.

Extent : It is considered important that the RCP includes the following information.

- i) A record of past works within the catchment.
- ii) The programme for future capital works.
- iii) A record of those settlements, both existing and future, which would benefit from flood warning information.
- iv) A review of trends identified in flood monitoring reports

Initial Sources: Examples of the sources of information and points of contact are as follows:

Flood Defence and Land Drainage Sections of the NRA
Local Authority and County Councils
Water Quality Sections of the NRA
Fisheries, Recreation and Conservation Sections of the NRA

Definition : Navigation concerns the regulation and administration of waterbourne traffic and associated facilities such as moorings and locks. Some Authorities are the navigation authority for various rivers by virtue of primary legislation and byelaws. Byelaws govern the registration of boats, levying of associated charges, licensing of craft and setting specifications for approval. Other navigable waterways are regulated by other authorities including the British Waterways Board and the National Trust.

Interactions : Navigable waterways contribute to the needs of the Flood Defence/Land Drainage function but have particular features and requirements. The efficient provision of navigation facilities involves dredging waterways and plant maintenance at locks. Such dredging has an impact upon Flood Defence/Land Drainage, Water Resources, Water Quality and Water Pollution Control as well as implications for the Hydrology, Geomorphology, Chemistry and Ecology/Biology of the environment.

Eg. Dredging may stir up sediments, causing higher levels of BOD, thereby damaging the fish stocks and recreational aspects of the catchment.

The operation of weirs etc. maintains satisfactory water levels to meet the requirements of Navigation and improves the Chemistry of the water through reaeration.

Locks, moorings and lock-keeper's houses are important local features and are often of Heritage and Landscape interest.

Extent : In the context of the RCP information to be collected in appropriate circumstances are as follows.

- i) Identify all appropriate Navigation authorities and the extent of navigational activities.
- ii) Record exiting traffic, lock-use, type of user.
- iii) Identify areas requiring routine dredging, bank protection etc.
- iv) Identify commercial and recreational users and the potential for, and constraints on, extending navigability.

Initial Sources: The following areas may provide information.
British Waterways Board
Navigation Sections of the NRA
Inland Waterways Association
Flood Defence/Land Drainage Sections of the NRA
Water Pollution Control Sections of the NRA

Definition : The aim of this function is to respond to and satisfy where practicable enquiries from the public in respect of the Authority's activities.

Interactions : To achieve the above aim the Authority will:

- (a) improve the provision of contact points and information services for the public and maintain good media relations and reporting;
- (b) ensure that the public is well informed of the Authority's obligations and activities and that the community's identity is reinforced by a common interest in the total river environment;
- (c) respond to any verbal or written communications from the public in the area regarding the Authority's obligations within a specified time.

This particular function is wide-spread in its interaction with other NRA functions and will be of great importance if the NRA is to obtain the full support of the public.

Extent : In the context of a RCP the minimum requirements where appropriate will be:

- i) to obtain the views of the public regarding their needs/wants related to the provision of information on the river environment;
- ii) to evaluate the ways in which information may be presented in order to overcome the traditional areas of conflict, ie. responsibilities for surface water, watercourse and sewerage-based flooding, riparian responsibilities, etc;
- iii) with respect to item ii) above to identify the need for specific publications and participate in external events, such as public consultations, as necessary;
- iv) quantify the scope and extent of public interest in the catchment and the need for information on particular issues in the catchment.

Initial Sources: Examples of the sources of information and points of contact are as follows:

Public Relations Section of the NRA
Customer Consultative Committees
Local Authorities and County Councils
Local Resident Associations
Individual Customers

Definition : Recreation covers all types of formal and informal activities both land and water-based. The Authority is under a statutory duty to provide facilities for and promote Recreation. This is achieved by developing and managing sites for recreational use and also through enhancing the environment.

Interactions : Flood Defence/Land Drainage works may cause temporary disruptions to Recreation as a result of restrictions of access and the temporary closure of facilities during construction activities. More permanent impacts will involve the loss of buildings, routes, land or water used for recreational pursuits.

The Public Perception of Water Quality is a significant influence on the degree of Recreation undertaken within the catchment. People will be less likely to swim off an EC designated beach if the river flowing onto it causes the bathing waters to fail the EC Directive. There is, therefore, a substantial link with the Microbiology of the water, effluent and runoff. The Chemistry of discharges may also deter people from undertaking recreational activities.

Eg. Foaming due to detergents from sewage treatment works may deter people from walking along a river bank.

Physical pollution (e.g. litter) can also act as a deterrent to recreational activities.

There is also a strong link with both Land Use and Water Use particularly with respect to their amenity value.

Extent : In the context of the RCP the minimum requirements may be as outlined below.

- i) Plot the existing uses including public rights-of-way and major open spaces within the catchment.
- ii) Note any areas of local recreation facilities ie. large sports grounds, areas of open water etc.
- iii) Note levels of use associated with the main recreation facilities.

Initial Sources: Information relating to this function may be obtained from the following sources:

Recreation Sections of the NRA
Regional Councils for Sport and Recreation
Angling/Sports Clubs and Riparian Owners
Local Authorities

Definition : This function is responsible for supervising all developments which affect Flood Defence/Land Drainage, flood risk and the river environment as well as any implications for Water Quality and Water Resources. In addition to making comments on developments proposed under the Town and Country Planning Act of 1971 and providing comments on Development Plans the Authority also controls the erection of structures in, over or under main rivers (Land Drainage Act 1976). The Authority can also insist on an assessment of the effects of any development upon the quality and well-being of surface water or groundwater under the EC Directive on Environmental Impact Assessment.

Interactions : The role of the Authority is, in many areas, only advisory. To achieve effective control it is therefore necessary to promote good Consultation and Liaison with planning authorities so that the Authority can influence the preparation of Development Plans and planning decisions where appropriate. The advice given must be based on sound technical arguments. However, because of the timescales for assessing applications this is not always possible unless appropriate studies have already been completed. The EC E.I.A. Directive has re-inforced the need to ensure Water Quality, Water Resources, Water Pollution Control, Fisheries, Geomorphology, Ecology/Biology, Chemistry etc. requirements are properly investigated at the assessment stage.

Extent : The basic requirements will be to :

- i) review exiting and proposed planning authority policies (as stated in the Structure Plan, Local Plan etc.) with regards to Flood Defence/Land Drainage, Fisheries and Water Pollution Control matters.
- ii) prepare, where appropriate, catchment-based "at risk" plans based on existing information at 1:2500 scale and incorporating surveyed level information. This information may be transferred onto a Geographical Information System.
- iii) review internal policies with regards to the planning control function in the catchment. This may include guidelines for the requirement of an environmental impact assessment.

Initial Sources: The most important sources of information are structure and development plans of County Councils and Local Authorities.

Definition : The Control of Pollution Act 1974 (Part II) gives the Authority powers to control the pollution of water in rivers, lakes, underground strata and coastal waters including estuaries. The Authority can grant consents for discharges, impose reasonable conditions to avoid adverse effects on the receiving waters and undertake monitoring in line with that discussed under Water Quality. (Discharges of trade or sewage effluent without, or outside the conditions of, a consent is an offence.)

Interactions : The prime concern of Water Pollution Control is to ensure that polluting matter does not harm the uses, amenity and general quality of the receiving water. Thus important interactions are with Water Quality, Fisheries, Public Relations, Recreation, Emergency Planning. Further fundamental interactions occur between Water Pollution Control and Chemistry, Ecology/Biology, and Microbiology. Knowledge of all the above are required if risks of pollution are to be identified.

Extent : Typical data required for the production of the RCP would include:

- i) establishing the nature and extent of discharges within the catchment;
- ii) determining the frequency and types of pollution incidents;
- iii) undertaking risk assessments based upon the consideration of the type of industry, farming practice and road use etc;
- iv) the consent conditions of all discharges including any thresholds eg. dates for seasonal consents, tidal conditions, and flow levels for storm overflows;
- v) history and current status of compliance with consent conditions including an assessment against the "upper tier" criteria.

Such information may be best held on a catchment inventory database (as currently being used by some regions) thereby ensuring that collation is an easy process.

Initial Sources: Information may be obtained from amongst other sources :

Water Pollution Control Sections of the NRA
Water and Sewerage Undertakers
Local Authorities and County Councils
External environmental groups
Her Majesty's Inspectorate of Pollution

Definition: The NRA is responsible for assessing, maintaining and planning the improvement of freshwater, groundwater and tidalwater quality. The quality of such waters may be determined by physical (eg. temperature), chemical (eg. dissolved oxygen content), microbiological (eg. bacteria) and biological (eg. invertebrate content) monitoring. Assessment is required against a range of standards both national and international in origin whilst improvement maybe needed to reach such standards.

Interaction : The most important of the Environmental Quality Objectives (EQOs) is that for potable water abstraction. The link between Water Resources and Water Quality is therefore a substantial one. Further EQOs relate to contact and non-contact sports as well as just the amenity value of the water thereby requiring an interaction with the Recreation function. Since the majority of NRA functions have either an impact on or an input to Water Quality there are numerous interactions with this particular function. To an extent many rivers are capable of self-purification so an understanding of the Ecology/Biology, Chemistry, and Microbiology of the river catchment environment is essential.

Extent: The RCP will require the following minimum information.

- i) Identification of the EQOs, related Environmental Quality Standards (EQSs), and the River Quality Objectives (RQOs) for each reach.
- ii) Determination of the current state of Water Quality within the catchment as assessed against the EQSs and RQOs.
- iii) Identification of waters under the influence of discharges containing dangerous substances.
- iv) Assessment of all waters designated under EC Directives.
- v) Evaluation of methods of water quality improvement eg. discharge consents, water protection zones.

Initial Sources: Initial sources of information may be :

Water Quality Sectors of the NRA
Water and Sewerage Undertakers
HMIP
MAFF
Environmental Groups

Definition : Water Resources is concerned with the management of sources of water including surface water in lakes and rivers as well as underground waters. The Water Resources Acts of 1963 and 1971 and the Water Act of 1973 provide the legislative basis for the Authority's duties and powers for conserving, redistributing or otherwise augmenting water resources in its areas, for securing the proper use of such resources. The 1963 Act sets out the Authority's powers to control and license abstractions and to regulate the impounding of water and the Authority's obligations to carry out periodic water resource surveys and to consider and establish, if necessary, minimum flows in rivers.

Interactions : The requirements for water supplies are determined by the size and location of domestic, industrial and agricultural demands and are met by the provision of water in suitable quantities and qualities. Hence, there are strong interactions between this function and Land Use, Water Use, Hydrology, Water Quality, Water Pollution Control and Development Plans which influence future demands.

Flood Defence/Land Drainage information may be of use to this function in identifying when low flow conditions are likely to have an adverse effect upon abstraction.

Water Quality is an important factor in determining whether a certain area of water is fit for abstraction.

Extent : Where appropriate the RCP will contain:

- i) schedule of major abstraction and impounding licenses with details of conditions. Locations plotted on a suitable Ordnance Survey base map;
- ii) details of on going and future programmes of works, if any, to provide Water Resources facilities which affect the catchment;
- iii) identify future/existing effects of Water Resources schemes on the low flow regime of the catchment;

Initial Sources: Examples of the sources of information as well as possible bodies involved in this function are as follows :

Water Resources Sections of the NRA
Water Quality Sections of the NRA
Water and Sewerage Undertakers
Local Authorities and County Councils

APPENDIX II
CATCHMENT ATTRIBUTE PROFILES

ARCHAEOLOGY/HERITAGE

CHEMISTRY

ECOLOGY/BIOLOGY

GEOMORPHOLOGY

HYDRAULICS

HYDROLOGY

LANDSCAPE

LAND USE

MICROBIOLOGY

PUBLIC PERCEPTION

RIPARIAN OWNERSHIP

TOPOGRAPHY

WATER USE

Definition : Archaeology is the study of man's past, by the scientific analysis of the material remains of his cultures. Heritage is the evidence of the past, such as historical sites and the unspoilt natural environment.

Interaction : No work can be undertaken under the Land Drainage Act 1976 that would be in contravention of the provisions of the Ancient Monuments Act 1979. As a result Flood Defence/Land Drainage functional interests must be reconciled, through Consultation and Liaison, with the duties of the local authorities under the later act.

The presence of buildings and landscapes which are considered part of our Heritage is an important consideration in River Catchment Planning.

It may be possible to enhance some areas of Heritage through appropriate works and cooperative relationship between the Authority and landowners.

By its definition Heritage is closely related to other catchment attributes such as Land Use, Land Ownership as well as the Recreation and Conservation functions.

Extent : The RCP must take account of the following.

- i) The relevant development plans.
- ii) Consultations with English Heritage and the National Trust.
- iii) Examine the register of sites and monuments of archaeological significance maintained by the relevant local authority (particularly with respect to Scheduled Sites that are statutorily protected).
- iv) Consult the County Archaeologist where appropriate.
- v) All appropriate information should be plotted on scaled plans.

Initial Sources: The following areas may be useful first contact points.

Fisheries, Recreation and Conservation Sections of the NRA.

Local Authorities

Historic Buildings and Monuments Commission

Local Interest Groups and Historic Trusts

National Trust

English Heritage

Countryside Commission

| | |
|-------------------|--|
| Definition : | The chemical composition of water and associated land environment need to be understood if the pressures of discharges and runoff are to be assessed. |
| Interaction : | <p>The chemical composition of soil may often be influenced by agricultural practises through pesticide/herbicide/insecticide spraying etc. The effect of chemicals upon the delicate balance of Water Quality is of particular importance to Water Pollution Control, Fisheries and Water Resources.</p> <p>The Land Use and Heritage through old mine workings can also affect water chemistry since high background metal levels can often persist for years.</p> <p>Forestation can cause both soil and water chemistry problems such as those experienced in Llyn Brianne in Wales. An understanding of such problems is essential if any remedial actions are to be taken.</p> |
| Extent : | <p>The RCP must take account of the following :</p> <ul style="list-style-type: none">i) Chemical byproducts of agricultural practises eg : breakdown products of Aldrin.ii) Change in soil and, as a result, water chemistry through land use changes. eg : acid water resulting from intensive forestation.iii) The contribution of human impact on water chemistry. eg : abandoned mine adits.iv) Chemical attributes of all substances held within the catchment.v) Chemical influence of all discharges to the catchment. |
| Initial Sources : | <p>Local Fire Service Water Quality Sector of NRA Local Research Establishments Water Pollution Control Sector of NRA Farm Wastes Group</p> |

Definition : This attribute describes the inter-relationships between animals, plants and their habitats. The latter can be subdivided into terrestrial and aquatic-based habitats. The well-being of the animals and the diversity and numbers of plants and animals are also of importance.

Terrestrial habitats can be categorised into non-recreatable (water table dependent), non-recreatable (not water table dependent) and habitats that are relatively easy to recreate.

Aquatic-based habitats can be subdivided into shallow river banks, river channel margins, slack pool areas and diverse wildfowl populations.

Interaction : Wildlife can suffer short-term disruption during any construction resulting from noise, water turbidity and flooding or drawdown of water-bodies during critical periods, primarily the nesting season.

Major long-term impacts relate to the destruction of habitat, loss of diversity and decrease in numbers of individuals due to factors such as reshaping of banks etc.

The effect of discharges and runoff on the Chemistry and Microbiology of the water have a significant impact upon the biology, not only of that water but also of the surrounding land. Consequently, the Ecology/Biology of the catchment may be enhanced by effective Water Pollution Control.

Wildlife interests may be indirectly affected by intensification of Land Use eg. forestation changing habitats.

Extent : In the context of the RCP the minimum requirement will be as follows.

- i) Identification of areas of Conservation value and interest eg. SSSIs, nature reserves.
- ii) Quantification of the effect of discharges and runoff on the Ecology/Biology.
- iii) Identification of all known habitats within the catchment.

Initial Sources: The following are possible sources of information.

Fisheries, Recreation and Conservation Sections of the NRA
NCC data on SSSIs etc.
RSPB
Conservation Groups

Definition : Geomorphology is concerned with the following two elements of the fluvial system:

- i) the drainage basin, which is dominated by flow through the soil;
- ii) the channel system which consists of the mainstream and all tributaries in which open channel flow occurs.

Geomorphology involves an understanding of the nature and behaviour of the fluvial system as a consequence of the natural and imposed environments.

Interaction : By providing an understanding of channel processes and form, Geomorphology can have a significant input to the appraisal and design of revenue and capital Flood Defence/Land Drainage works, projects which conserve and enhance the general environment.

Impacts affecting channel processes can arise at the catchment scale eg. Land Use changes, agricultural practices, along the channel reach or at a specific sites eg. localised effects of structures which are assessed by Statutory Planning and Control.

Extent : The application of fluvial Geomorphology techniques in the planning and management of catchments is relatively new. However, as a minimum, the following work should be undertaken within the RCP.

- i) characterisation of the catchment and the channel in terms of general criteria ie. geology, stream frequency, soil type, slope, bed and bank sediments;
- ii) evaluation of channel stability;
- iii) outline survey of channel to assess sensitivity to change and the channel's major features;
- iv) identify flood/ebb channels in tidal reaches.

Initial Sources: Relevant information may be provided by the sources outlined below.

Flood Defence/Land Drainage Sections of the NRA
Water Quality Sections of the NRA
Fisheries, Recreation and Conservation Sections of the NRA
Farm Wastes Group
Local Authorities

Definition : Hydrology is the study of the occurrence, circulation and distribution of water above, on and under the land surface. In this case attention is focused on the understanding, measurement and analysis of the precipitation, runoff, groundwater and watercourse flow phases.

Interaction : Knowledge of the quantity (intensity and volume), distribution (location and duration) and occurrence (frequency) of rainfall, groundwater and river flow enables projects to be evaluated and designed so that they meet their objectives. As a result there are interactions with Flood Defence/Land Drainage, Water Resources, Water Pollution Control, Fisheries etc.

The hydrological cycle is very dependent on changes in Land Use such as urbanisation or intensification of farming practises which can dramatically alter the flow regime of river systems.

Extent : Where sections of a catchment have been subjected to a major capital works scheme it may only be necessary to catalogue and review the relevant parts of the project reports. However, increased lengths of hydrological records and the availability of new techniques may necessitate revised analyses. In some cases, where computational hydraulic models are being used to define floodplain extents, hydrological investigations may be required. This could involve installation of hydrometric equipment, data analysis and hydrological modelling.

The basic aim will be to provide estimates of the most important parameters at critical parts throughout the system. These will include:

- i) definition of the typical and critical rainfall characteristics (with respect to duration, season etc.) for a range of return periods.
- ii) definition of the peak flood flows/volumes for a range of return periods.

Initial Sources: The following points of contact may provide relevant information.

Institute of Hydrology
Meteorological Office
Local Authority and County Council Land Drainage Sections
British Waterways Board
Flood Defence/Land Drainage Sections of the NRA

Definition : The study of Hydraulics is concerned with the physical processes involved in the movement of water. A study of the system Hydraulics enables the relationships between rates of flow velocity and water level to be determined.

Interaction : The manner in which the system functions particularly during periods of high flow, is perhaps the most important of the catchment attributes from a Flood Defence/Land Drainage point of view and interacts with many other functions and attributes.

The primary interactions are described below.

- i) Topography, which defines the system conveyance.
- ii) Geomorphology, which governs the form of the channel.
- iii) Flood Defence/Land Drainage by providing information relating to tides (oceanography).
- iv) Fisheries, weirs and falls pose problems to fish.
- v) Water Resources, which influences groundwater and river abstractions.
- vi) Water Quality, faster moving rivers generally have a greater oxygen content.

Extent : To provide data for the RCP hydraulic analysis is required to carry out those tasks listed below.

- i) Establish system conveyances and structure functions.
- ii) Identify areas at risk from flooding.
- iii) Determine existing standards of protection.
- iv) Identify restrictive structures and channel reaches.
- v) Identify and quantify groundwater problems associated with perched and embanked channels.
- vi) Determine tidal and current characteristics for the appropriate reaches.

Initial Sources: Useful information may be found with the following.

Water and Sewerage Undertakers
Local Authorities and County Councils
British Waterways Board
Fisheries Sections of the NRA

Definition : The Landscape reflects the complex interplay between the natural environment and man's activities. Geomorphology, Topography, Land Use and drainage provide the basic elements of the Landscape and, together with associated vegetation and settlement patterns, determine the essential Landscape character of different areas.

Interaction : In the context of a River Catchment Plan it is important to define not only the key elements of the Landscape but also the differing perceptions which exist amongst those who use, or come into contact with an area. It is also important to consider the Landscape as an environmental resource which is sensitive to change and which requires careful management and positive enhancement whenever possible.

The nature and quality of the Landscape together with a wide range of other catchment attributes will influence the form and character of proposed Flood Defence/Land Drainage works. This in turn, needs to be taken into account by the Authority in exercising some of its functions.

The built environment has a great influence upon the Landscape and links in particularly with Statutory Planning and Control which influences the extent of new developments within the flood plain.

The change in agricultural practises also influences the Landscape eg. the move from arable farming to a dairy based industry.

Extent : In the first instance it is necessary to plot either on a suitable scale map or on a GIS, the principal landscape elements, including principal stands of vegetation, drainage and settlement patterns, roads and footpaths, and other features which contribute to the overall character of the Landscape within the river corridor.

Following this preliminary assessment the Landscape "character zones" or areas of common identity should be plotted. Special features, viewsheds and areas of particular importance should be highlighted.

Initial Sources: Information may be gained from the following sources:

Fisheries, Conservation and Recreation Sections of the NRA
Structure and Local Plan Reports of Survey
Countryside Commission Reports
Aerial Photographs
Historic Maps

| | |
|--------------------------|--|
| <u>Definition</u> : | For the purpose of River Catchment Planning Land Use is concerned with describing the type, location, areal extent, and pattern of activities carried out on land. |
| <u>Interaction</u> : | <p>In determining the overall character of an area Land Use is directly related to a wide range of other catchment attributes and functions.</p> <ul style="list-style-type: none">i) Landscape - new buildings and developments will inevitably alter the Land Use.ii) Recreation - the activities undertaken in the catchment will dictate the Land Use eg. sports grounds.iii) Water Quality - type of farming prevalent in the catchment will affect the Chemistry and Microbiology of the water eg. Dieldrin run-off from bulb fields accumulating in fish.iv) Flood Defence/Land Drainage - the run-off and water retention characteristics will be altered by a change in Land Use eg. a change from agricultural pasture to urban development resulting in increased speed of run-off.v) Ecology/Biology - this will depend upon the Land Use and, when it is of value, will also determine future Land Use. |
| <u>Extent</u> : | <p>In the context of a PCP the minimum level of investigation should involve the definition of principal "character areas" within the catchment eg. residential, industrial, agricultural, recreational. This will be achieved by reviewing development plans and other sources of Land Use data, and plotting this information on a suitable scale map.</p> <p>Where more detailed information is required specific field surveys may be carried out and Land Use data plotted on appropriately scaled maps.</p> <p>Land Use is not a static phenomenon and it is essential to monitor and anticipate changing patterns of Land Use within the catchment. A review of historic records and maps and comparisons between old and new aerial photographs may provide useful information on changes in Land Use, and assist in the identification of areas of pressure.</p> |
| <u>Initial Sources</u> : | <p>Information may be gained from the following sources:</p> <p>MAFF Structure and Local Plan Reports of Survey Aerial Photographs and Satellite images</p> |

- Definition : The Microbiology involves the assessment of both pathogenic and non-pathogenic organisms including bacteria (E.Coli) and viruses capable of entering a watercourse. This may involve the methods by which they are introduced into the system as well as the pathways followed once in the water environment.
- Interaction : The requirement to monitor the viral and bacterial content of some waters for the Bathing Waters Directive places a significant duty upon the authority to demonstrate an understanding of the microbiological aspects of Water Quality.
- The origins of many microbiological organisms are varied and range from Land Use - Agriculture (pollution from yard washings or animal slurry) to continuous discharges and storm overflows (Water Quality and Water Pollution Control).
- Public perception of microbiology is rightly poor since many of the Recreational values of a catchment may be reduced by adverse microbiological attributes.
- Fisheries interests may also be affected by the microbiological content of the water since fish stocks may be considerably depleted by pathogenic organisms.
- Extent : The influences on the microbiology of the water will need to be included within the RCP possibly by addressing the following points.
- i) Determination of the microbiological influence of discharges.
 - ii) Assessment of the die-off rates for the various organisms under a range of conditions (differing temperatures and levels of sunlight).
 - iii) Evaluation of disinfection techniques in terms of both their efficacy and efficiency.
 - iv) Determination of the toxicity of each microbiological determinand.
 - v) Assessment of the microbiological quality of the catchment perhaps in relation to the EC Bathing Water Directive levels (possibly with a 50 fold dilution around discharges).
- Initial Sources : Water Quality Sectors of the NRA
Water Pollution Control Sectors of the NRA
Recreation Sectors of the NRA
Water and Sewerage Undertakers
Local Environmental Health Officers

- Definition : An important part of the NRA's approach to River Catchment Planning must be to obtain from the public their perception of its services.
- Interaction : While monitoring of public attitude through Consultation and Liaison is a vital component of a River Catchment Plan preparation and scheme implementation, it is also as important to obtain a representative opinion of the public's perception.
- The Public Perception will inevitably overlap and strongly interact with the Public Relations and Consultation and Liaison functions. Local authorities and the Authority's own Public Relations sections will be consulted. Their advice and cooperation is of paramount importance in achieving the credibility of any Public Perception survey reports.
- It is evident that all functions will benefit from obtaining the public's view on the way the NRA is discharging its responsibilities.
- Extent : The RCP must take account of the following :
- i) The public's preferred remedial action plans.
 - ii) The effectiveness of the Public Perception surveys in terms of their cost, response and provision of new information.
 - iii) Public awareness of the riparian owners' responsibilities.
- The RCP should indicate where relevant Public Perception surveys have already been undertaken within the catchment, perhaps for previous capital schemes.
- Existing surveys undertaken on other catchment or even by other regions may well be relevant to the catchment under study and these surveys should be highlighted in the RCP.
- Initial Sources: Possible sources of information may be as listed below.
- Public Relations Sections of the NRA
Local Authorities
Fisheries, Recreation and Conservation Sections of the NRA
The General Public

Definition : Topography is concerned with the surface form of the land including natural and artificial features.

Interaction : The Authority utilises topographical and hydrographical survey information in relation to a number its functions including Water Resources and Flood Defence/Land Drainage.

Channel and floodplain data forms the basis for calculations of cross-sections, slope analysis, areas of land subject to flooding and run-off patterns. Contour plans derived from this data may also be used in the analyses of Landscape issues and potential Land Use.

Extent : In the context of the RCP the following information will be required where appropriate :

- i) prepare general location map of the catchment, its watercourses and general features at a suitable scale;
- ii) prepare a contour plan of the catchment and/or river corridor using existing data sources;
- iii) collect relevant aerial survey photography.

Depending upon the level of detail required additional study could include :

- i) 0.5m contour details on OS 1:1250 or 1:2500 base maps showing flood plains, potential flood storage areas and areas subject to flooding for events upto the 1 in 200 year return period event;
- ii) strip plans from OS 1:1250 or 1:2500 base maps showing locations and extent of measured cross-sections of channels, structures etc.;
- iii) longitudinal section of rivers;
- iv) measured channel and floodplain cross-sections - spacing determined by hydraulic modelling requirements;
- v) cross and longitudinal sections at and adjacent to structures such as weirs, sluices and bridges;

Initial Sources: Information may be gained from the following sources:

Ordnance Survey Maps and Aerial Photographs
Local Authority Survey Data
Aerial Photographs

Definition : Land or Riparian Ownership is concerned with the proprietary rights of an individual, group or organisation over land. It may be useful to divide landowners into categories; major and minor, public and private, institutional and individual.

Interaction : Riparian Ownership is closely related to a number of other catchment attributes, in particular Land Use, Landscape and Public Perception. Ownership patterns may have a bearing on the likely extent of future development in a catchment.

Without the cooperation of Riparian Owners the Authority would be unable to implement many of its responsibilities effectively. The Authority has therefore sought to establish, wherever possible, Consultation and Liaison with Riparian Owners in order to fulfill its statutory functions.

The successful implementation of Farm Campaigns aimed at encouraging Water Pollution Control through good agricultural practises requires the cooperation of the farming Riparian Owners.

Extent : In the context of the RCPs the first task will be to identify, where possible, riparian owners and gain an overall picture of ownership patterns. This will be achieved by reviewing existing internal sources of data and plotting information on a suitable scale plan.

More detailed information, particularly for sensitive areas, may be obtained by field survey plotted on a large scale plan or contained within a Geographical Information System.

Initial Sources: The following areas may be useful first contact points.

All Sections of the NRA.
Local Authority records
Land Register
County Land Owners Association
National Farmers Union

Definition : This attribute describes the type, location, areal and temporal extent and pattern of activities carried out on, or near, water.

Interaction : Defining the uses to which particular parts of the catchment are put is crucial in determining the Environmental Quality Objectives and Standards (EQOs and EQSS) required to protect them. There are, therefore, substantial links with Water Quality, Water Resources, Fisheries, Recreation, and Conservation.

Extent : The RCP will need to identify all parts of the catchment that are used for the following uses.

- i) Potable Water Abstraction
- ii) Salmonid Fishery
- iii) Cyprinid Fishery
- iv) Industrial Abstraction
- v) Agricultural Irrigation
- vi) Livestock Watering
- vii) Commercial Fishery
- viii) Commercial Shellfishery
- ix) Bathing
- x) Water Contact Sports
- xi) Non-contact Amenity
- xii) General Ecosystem Conservation
- xiii) Gravel Extraction
- xiv) Effluent Disposal
- xv) Flood Defence

The extent of the above should be held on a suitable Ordnance Survey base map or on a Geographical Information System.

The use of aerial photographs will assist in identifying the extent of each of the above uses. However, care should be exercised since many sports, such as swimming, are dependent upon the weather and time of year.

Eg. The bathing season is usually determined to be May to October.

Initial Sources: The following sources may provide relevant information.

Aerial photographs
Freshwater Fish Directive designated lengths
Flood Defence/Land Drainage Sections of the NRA
Water Quality Sections of the NRA
Fisheries, Recreation and Conservation Sections of the NRA
Water Pollution Control Sections of the NRA
RSPB
Shellfish Association of Great Britain
NCC
Angling Clubs
Water and Sewerage Undertakers

APPENDIX III

PHASE 1 : PRODUCTION OF RIVER CATCHMENT EVALUATION REPORT

- STAGE I : SET UP MULTI-FUNCTIONAL RIVER CATCHMENT PLANNING GROUP
- MANAGERIAL AND TECHNICAL SUPPORT
- STAGE II : IDENTIFY TARGETS FOR CATCHMENT
- IDENTIFY IMPORTANCE OF FUNCTIONS WITHIN THE CATCHMENT
- IDENTIFY IMPORTANCE OF EACH CATCHMENT ATTRIBUTE
- DETERMINE TARGET LEVELS OF SERVICE FOR EACH FUNCTION
- DETERMINE INFORMATION REQUIRED FOR EACH ATTRIBUTE
- IDENTIFY POTENTIAL USERS OF CATCHMENT
- CONSULT APPROPRIATE STATUTORY/REPRESENTATIVE BODIES
- IDENTIFY RESULTANT TARGET USES OF CATCHMENT
- IDENTIFY OBJECTIVES FOR PROTECTION/PROMOTION OF USES
- IDENTIFY STANDARDS APPROPRIATE FOR OBJECTIVES
- SUMMARISE CORPORATE CONSIDERATIONS
- SUMMARISE TARGETS FOR CATCHMENT
- STAGE III : IDENTIFY CURRENT STATUS OF CATCHMENT
- SEEK LOCAL OPINION THROUGH APPROPRIATE CONSULTATION
- ASSESS CURRENT USES AGAINST POTENTIAL USES
- ASSESS CURRENT STATUS AGAINST CURRENT OBJECTIVES
- ASSESS DEGREE OF NON-COMPLIANCE WITH STANDARDS
- CARRY OUT RISK ASSESSMENT (POLLUTION & FLOOD DEFENCE)

- PATH 1 : IF FUNCTIONAL INFORMATION DEFICIENCY IS SIGNIFICANT PROCEED TO STAGE IIIA FOR THAT FUNCTION IN PARALLEL TO STAGE IV FOR ALL OTHER FUNCTIONS.

- PATH 2 : IF NO INFORMATION DEFICIENCIES OR DEFICIENCY NOT SIGNIFICANT THEN PROCEED TO STAGE IV FOR ALL FUNCTIONS.
- STAGE IIIA: BASELINE SURVEYS FOR FUNCTIONS WITH INSUFFICIENT DATA
- PRODUCE REPORT OUTLINING EXTENT, AIM & COST OF SURVEY
- UNDERTAKE BASELINE SURVEY
- RETURN TO STAGE III
- STAGE IV : IDENTIFY CATCHMENT SHORTFALLS & POTENTIAL ACTIONS
- IDENTIFY AREAS BELOW TARGETS
- RANK PROBLEM AREAS WITH RESPECT TO SHORTFALLS
- IDENTIFY ACTIONS FOR ALL SHORTFALLS
- PUT FORWARD A NUMBER OF IMPROVEMENT OPTIONS
- STAGE V : DRAW UP DRAFT RIVER CATCHMENT EVALUATION REPORT
- FORMAT AS SPECIFIED BY CATCHMENT PLANNING GUIDELINES
- DISTRIBUTE TO ALL FUNCTIONAL AREAS
- UNDERTAKE INTERNAL REVIEW OF DRAFT REPORT
- STAGE VI : PUBLIC CONSULTATION
- PUT OPTIONS TO PUBLIC CONCERNED
- PUT OPTIONS TO PARTIES CONSULTED IN ABOVE STAGES
- SUMMARISE RESULTS OF CONSULTATION
- STAGE VII : FINAL REVIEW OF RIVER CATCHMENT EVALUATION REPORT
- REPEAT STAGES IV TO VII IF REQUIRED
- PASS TO PHASE 2 - THE RIVER CATCHMENT PLAN

APPENDIX IIIA FORMAT OF RIVER CATCHMENT EVALUATION REPORT

1. EXECUTIVE SUMMARY

2. INTRODUCTION

- River Catchment Planning
- Overview of the Catchment
- NRA Functions and Catchment Attributes

3. CATCHMENT EVALUATION

- Principal Function Analysis Sheets
- Catchment Attribute Analysis Sheets

4. CATCHMENT STATUS

- For each Principal Function
- For each Catchment Attribute

5. PROPOSED REMEDIAL ACTIONS

- For each Principal Function
- For each Catchment Attribute

6. CONCLUSION

Appendix I : List of Consultees

Appendix II : Legislation Appropriate to Catchment

APPENDIX IV

PHASE 2 : PRODUCTION OF THE RIVER CATCHMENT PLAN

- STAGE I : SUMMARISE FINDINGS OF PHASE 1
- BASIS FOR TERMS OF REFERENCE FOR PHASE 2
- STAGE II : ESTABLISH/REVISE FUNCTIONAL REMEDIAL ACTION PLANS
- TACKLE EACH PROBLEM FROM A MULTIFUNCTIONAL VIEWPOINT
- INCLUDE TIMESCALES (FIRM END DATES FOR EACH ACTION)
- INCLUDE COSTS (REVENUE & CAPITAL)
- INCLUDE APPROACH
- INCLUDE ASSESSMENT OF FUTURE TARGET COMPLIANCE
- INCLUDE DEGREE OF RISK ASSESSMENT REDUCTION
- STAGE III : PRODUCE DRAFT RIVER CATCHMENT PLAN
- SUMMARISE INDIVIDUAL ACTION PLANS
- DISTRIBUTE TO ALL FUNCTIONAL AREAS
- REVIEW DRAFT ACTION PLAN
- ASSESS AGAINST BUSINESS PLAN
- ASSESS AGAINST CORPORATE PLAN
- UNDERTAKE PUBLIC CONSULTATION (SHORT TIMESCALE)
- STAGE IV : PRODUCE FINAL RIVER CATCHMENT PLAN
- DISTRIBUTE TO ALL CONCERNED PARTIES
- DISTRIBUTE TO ALL CONSULTED PARTIES
- STAGE V : RECOMMENDATION TO REVIEW RIVER CATCHMENT PLANNING GUIDELINES
-

APPENDIX IVA FORMAT OF RIVER CATCHMENT PLAN

1. EXECUTIVE SUMMARY

2. INTRODUCTION

- The NRA
- River Catchment Planning
- Overview of the Catchment

3. REMEDIAL ACTION PLANS

- Details for each Function/Attribute
- Double page format

4. SUMMARY OF ACTION PLANS

5. RECOMMENDATIONS

- Review of River Catchment Planning Guidelines

Appendix I : List of Consultees

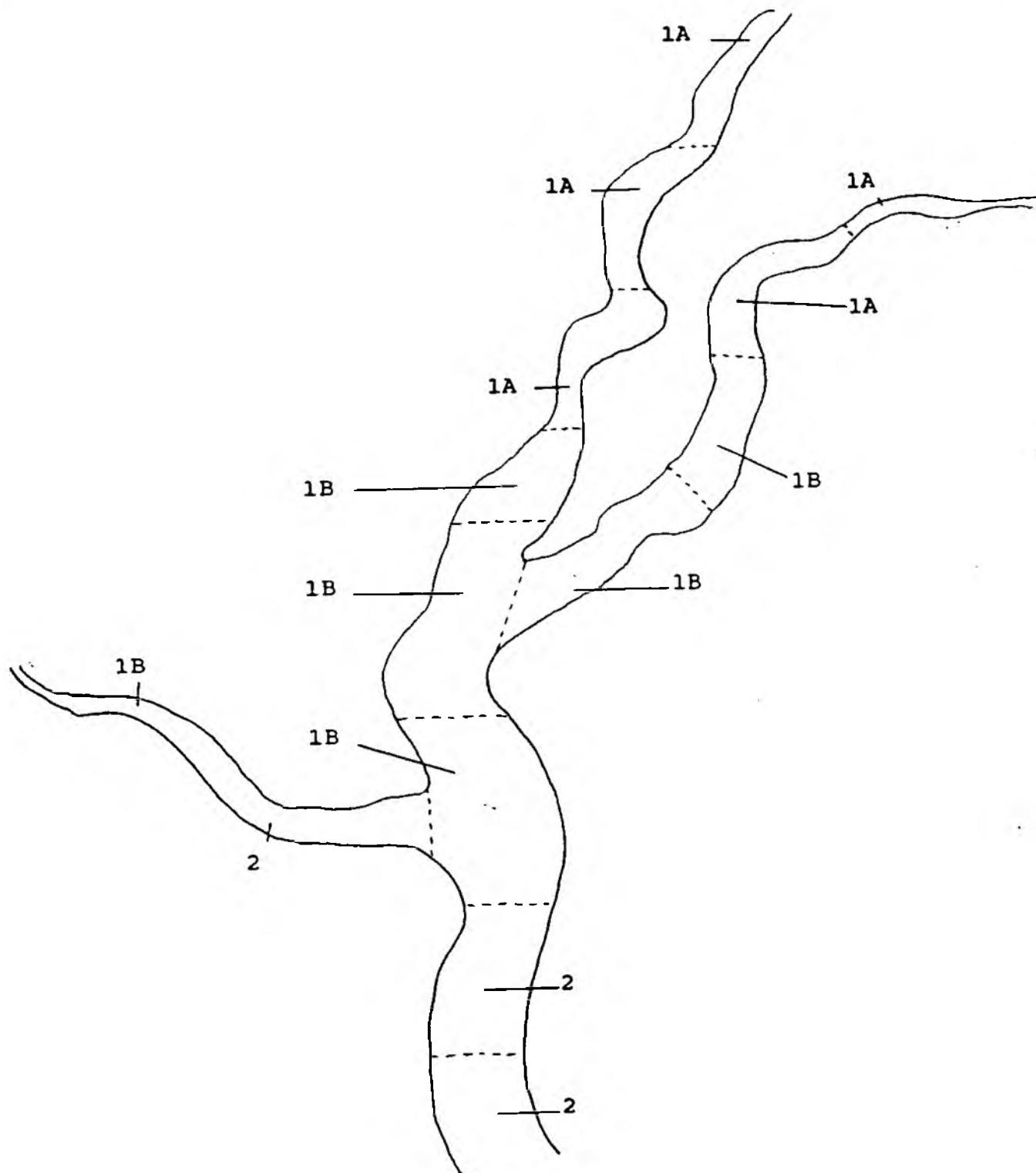
APPENDIX V

EXAMPLE PRINCIPAL FUNCTION

ANALYSIS SHEET

RIVER ANON CATCHMENT TARGETS - WATER QUALITY

RQO Using NWC Classification



PRINCIPAL FUNCTION ANALYSIS : WATER QUALITY

RESPONSIBLE OFFICER : A.N. OTHER (WATER QUALITY PLANNER)

SUMMARY :

The waters of the Upper Anon catchment are generally of reasonably high quality with the majority of the catchment complying with a River Quality Objective varying between 1A and 2. However, there appears to be a degree of water quality deterioration in some of the areas of the main river and, as such there is a need to ensure preservation of the quality of the water. The source of deterioration has been determined to be discharge consent non-compliance. Any further land drainage and sewage disposal schemes must ensure that adequate consideration is taken of the minimum flow and dilution requirements for the catchment.

TARGETS :

River Quality Objectives have been set for all river reaches within the catchments. In doing so the water uses have been identified and taken into consideration. Consequently, the target for this particular function must be centred around the RQO. The water quality of the catchment must be maintained and, where necessary, improved in order that the RQOs may be achieved, preferably in 100% of samples taken.

INFORMATION :

Surface water quality is monitored at 6 sites on the main river as well as at a further 5 sites on tributaries contributing to the catchment under study. The data is collected as part of a wider routine water sampling programme operated by the NRA and the results are assessed against the NWC classification including the requirements of EIFAC. The results give a classification of 1B in the majority of river reaches although some are class 2 and others class 1A. Further information has been obtained from the following sources:

Water Resources : Abstraction water quality

Water Pollution Control : Pollution records

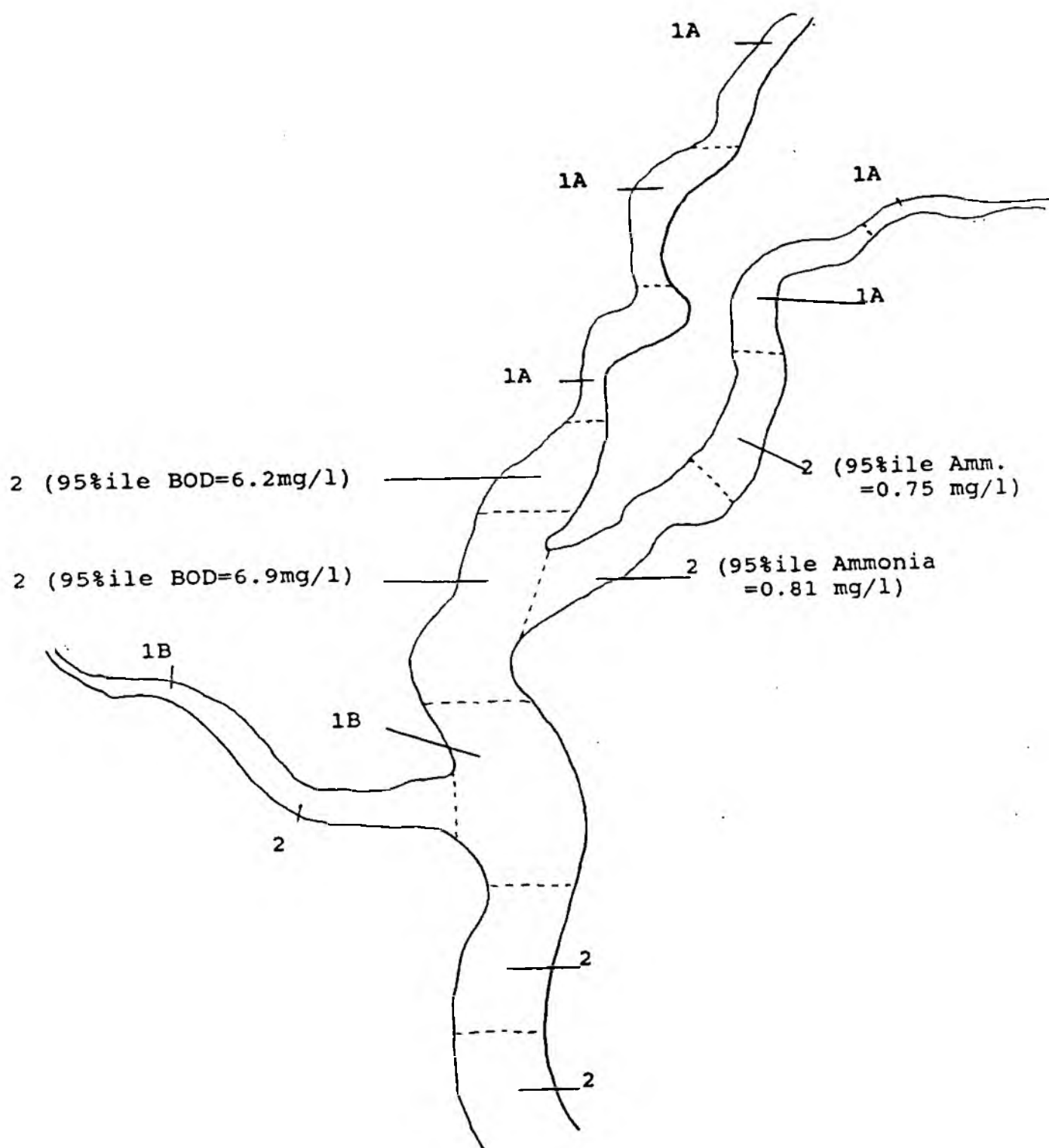
Public Consultation : local knowledge of aesthetic quality

Members of the public have indicated that 'foaming' has occurred in particular reaches at points downstream of certain discharges during periods of 'low river levels'.

There are two reaches of the main river have levels of BOD that cause non-compliance with the RQO producing a class 2 classification. There are further two sites on tributaries of the main river that also class 2, the non-compliance being caused by high levels of ammonia.

RIVER ANON CATCHMENT STATUS - WATER QUALITY

RQC Using NWC Classification



EVALUATION :

Although water quality is of a generally high standard, information from the Water Resources function indicates that periods of low flow can occur and these may be responsible for water quality problems in the upper reaches of the catchment. In such cases, especially if they become prolonged, there may be insufficient dilution of sewage discharges (the same may also be true for other effluent discharges) and subsequent fish kills may occur. This could also explain the observation of 'foaming' by members of the public and pollution records have confirmed that fish kills have occurred in similar circumstances.

The non-compliance with the RQOs for particular reaches of both the main river and some tributaries are almost certainly due to discharge consent failure and, as such, are more easy to rectify.

INTERACTIONS :

The following interactions are of particular importance, although further inter-functional co-operation must not be ignored.

Water Resources : Monitoring of low flows.
Location of abstraction points.

Fisheries : Risk assessment of fish kills.
Location of fish farms.

Water Pollution Control : Location of discharges.
Pollution records.

Land Drainage : Flow regime maintenance.
Improved land drainage.

ACTIONS :

- a) Identify areas where enhancement of land drainage will protect and/or improve water quality.
 - b) Maintenance of water quality with some improvement at the top of the catchment possibly through improved agricultural practises or more stringent discharge consents.
 - c) Possible reduction of sewage discharge volumes during periods of low river flow.
 - d) Formation of protection zones in areas where abstractions are threatened by the decrease in water quality.
-

Minimum Composition of the Catchment Planning Group

Management Staff

Member of Regional Management Team
Catchment Planner
Assistant Catchment Planner

Core Staff

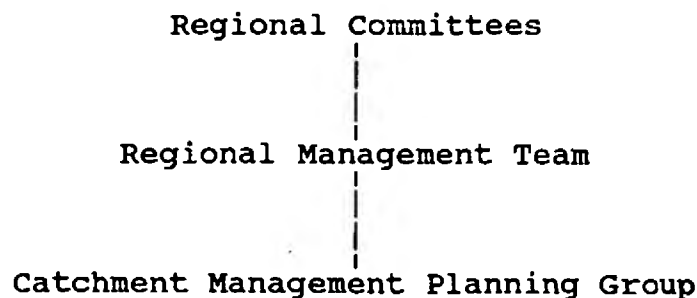
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|-------------------------|-------------------------------------|
| Water Quality Planner | WQO/Discharges/Pollution/Scientist |
| Water Resources Planner | Groudwater/Abstractions/Flow/Hydrol |
| Flood Defence Planner | Levels of Service/Capital Schemes |
| Fisheries Scientist | Stocks/Ecotoxicology/Biologist |
| Recreation/Conservation | Habitats/Land Use/Amenity/Ecologist |

Support Staff

| | |
|------------------------|-------------------------------------|
| Business Planning | Resource implications/requests |
| Finance | Audit accountability |
| Information Technology | GIS/System Commonality/IT strategy |
| Public Relations | Consultation/Liaison/Feedback |
| Legal Representative | New and future legislation |
| Technical Support | Data/information collation/present. |
| Administrative Support | Filing/clerical duties |

Wherever possible at least one of the Management or Core members of the Group should have recent, detailed knowledge of, or live in, the catchment being studied.

Reporting Lines



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