

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT



NRA

National Rivers Authority

Southern Region

**Guardians of the
Water Environment**

© National Rivers Authority 1992

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior written permission of the National Rivers Authority.

The information contained in this report has been compiled in good faith but its accuracy cannot be guaranteed by the Authority.



ENVIRONMENT AGENCY

NATIONAL LIBRARY &
INFORMATION SERVICE

HEAD OFFICE

Rio House, Waterside Drive,
Aztec West, Almondsbury,
Bristol BS32 4UD

National Rivers Authority
Information Centre
Head Office

Class No

Accession No ANEM

*River Itchen Catchment Management Plan
Consultation Report*



CONTENTS

INTRODUCTION TO CONCEPT

SECTION A : GENERAL INFORMATION

- A1. THE CATCHMENT
- A2. HYDROLOGY AND HYDROGEOLOGY
- A3. INTERACTIONS WITH PLANNING AUTHORITIES

SECTION B : USES

- B1. PUBLIC WATER SUPPLY
- B2. WATER SUPPLY FOR INDUSTRY AND AGRICULTURE
- B3. AQUATIC AGRICULTURE
- B4. RESOURCE USAGE
- B5. STATUTORY WATER QUALITY OBJECTIVES
- B6. EFFLUENT DISPOSAL
- B7. INTERMITTENT AND DIFFUSE POLLUTION
- B8. FLOOD DEFENCE AND LAND DRAINAGE
- B9. CONSERVATION
- B10. FISHERIES
- B11. RECREATION AND AMENITY

Continued Overleaf

SECTION C : TARGETS

- C1 RIVER FLOW TARGETS
- C2 WATER QUALITY TARGETS
- C3 RIVER TOPOGRAPHY TARGETS
- C4 RIVER MANAGEMENT TARGETS

SECTION D : STATE OF THE CATCHMENT

- D1 RIVER FLOW
- D2 WATER QUALITY
- D3 RIVER TOPOGRAPHY
- D4 RIVER MANAGEMENT
- D5 CONCLUSIONS

SECTION E : MANAGEMENT OPTIONS

APPENDICES

1. **GLOSSARY OF TERMS AND UNITS**
2. **NRA MISSION STATEMENT**

I INTRODUCTION TO CONCEPT



- I.1 The Water Act 1989 established the National Rivers Authority (NRA) as the "Guardian of the Water Environment", a non-departmental government organisation with particular responsibility for regulating and managing water resources, water quality in coastal and inland waters, flood defence, salmon and freshwater fisheries, water recreation and, in some areas, navigation. An additional duty laid on the NRA was to further conservation of the natural environment, seeking opportunities for enhancement wherever possible.

With no "market" to provide an economic yardstick for setting priorities a new basis for planning was called for. NRA Regions are defined with reference to the surface water catchments of river basins - singly, as in the Thames Region (which is divided into sub-catchments), or in geographical groups of individual river catchments. With the exception of sea defence and coastal water pollution control all the NRA's functions are managed within this catchment framework; the need to resolve conflicts arising from differing functional objectives makes it essential to integrate the NRA's planning in the same way.

Catchment Management Plans relate firstly to the Authority's own operations, including its activity as a statutory regulator controlling the actions of others. However, the planning process also offers an opportunity to seek an input from the public to the development of NRA policy, and for the Authority itself to draw attention to its priorities and aspirations for the improvement of the water environment.

The Plans concentrate on topics where the Authority has a direct interest and are focused mainly on the river corridor, although some functions such as water resource management and pollution control inevitably extend over the whole catchment area. Whilst they lack the status of statutory planning documents, it is hoped that Catchment Plans will make a positive input to the Town and Country planning process.

It is the intention of the NRA to consult widely with the general public and interested organisations before definitive Catchment Management Plans are published. This Consultation Report, the result of extensive internal discussion and study, is offered for comment as the first stage of the process.

- I.2 The Consultation Report for the Plan consists of five sections:-

Section A : General Information

This section provides a background to the catchment. It includes a range of catchment statistics and also explains the interaction of the NRA with the statutory planning authorities.

Section B : Uses

The purpose of this section is to identify USES of the catchment, both actual and potential.



NRA

For each of the USES, there is usually a diagram of the catchment, accompanied by a limited amount of text. The diagram shows broadly where the USE takes place in the catchment and some additional data where this is appropriate.

The text is divided usually into 3 sections:

- **General.** This describes some of the general characteristics of the USE and any relation it may have to other USES in the plan.
- **Local Perspective.** This describes how the USE manifests itself within the particular river catchment.
- **Environmental Requirements.** This details the specific requirements to enable the USE to take place in the catchment.

The Environmental Requirements relate to the following characteristics of the river:

- **River Flow.** The flow of water in the river including its variation throughout the year.
- **Water Quality.** The chemical and biochemical conditions in the river itself or in the groundwater of the catchment.
- **River Topography.** The physical characteristics of the river such as its width and depth; weirs; locks; natural features like pools and riffles; footpaths.
- **River Management.** The regular activities carried out on the river such as weedcutting; control of water levels; fish stocking.

Section C : Targets

The purpose of this section is to integrate the environmental requirements for all uses to give OVERALL TARGETS for different reaches of the river.

Section D : State of The Catchment

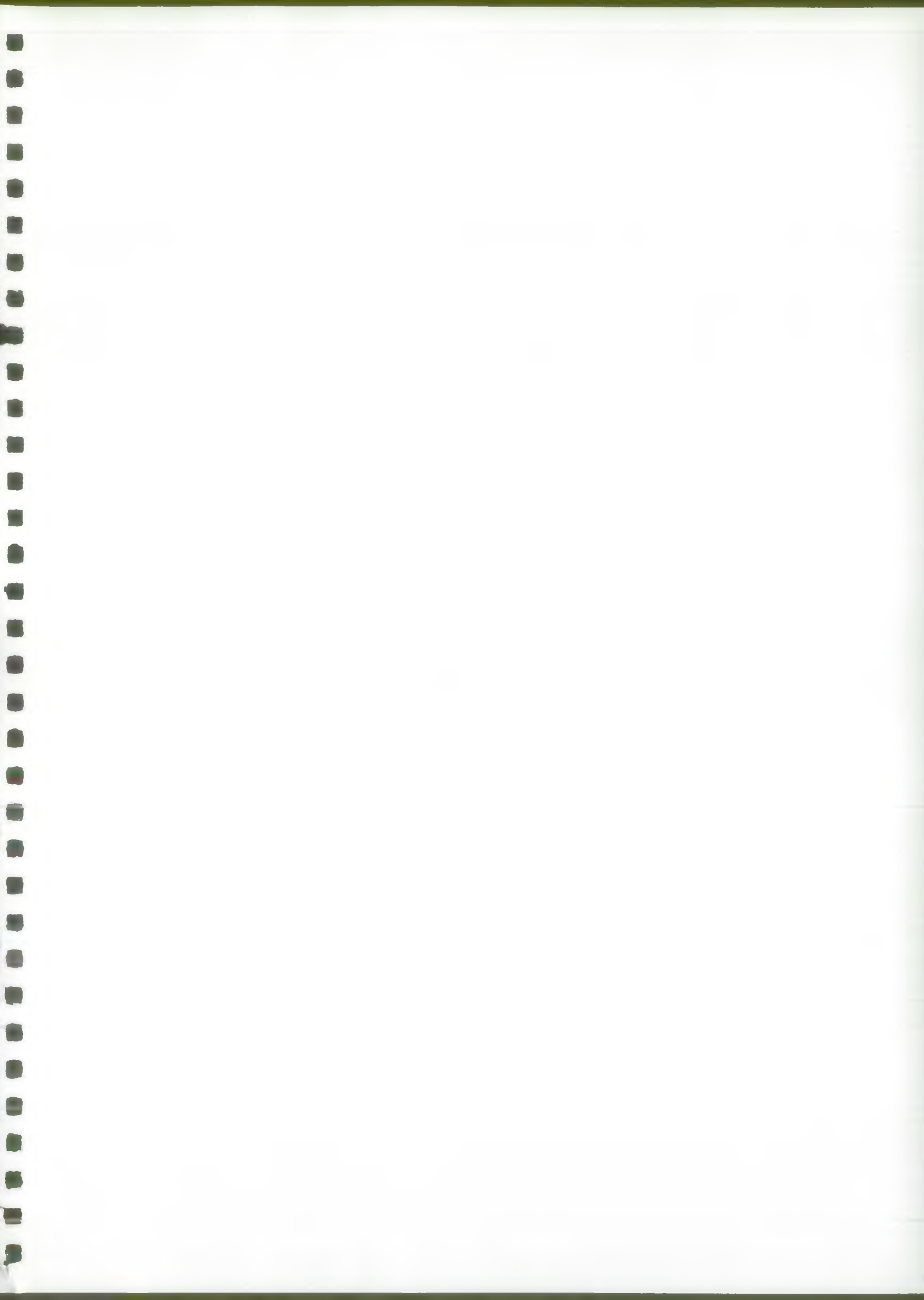
The PRESENT STATE of the catchment is assessed by comparing data with the OVERALL TARGETS. This identifies PROBLEMS due to failures to meet targets and CONFLICTS where different USES have opposing requirements.

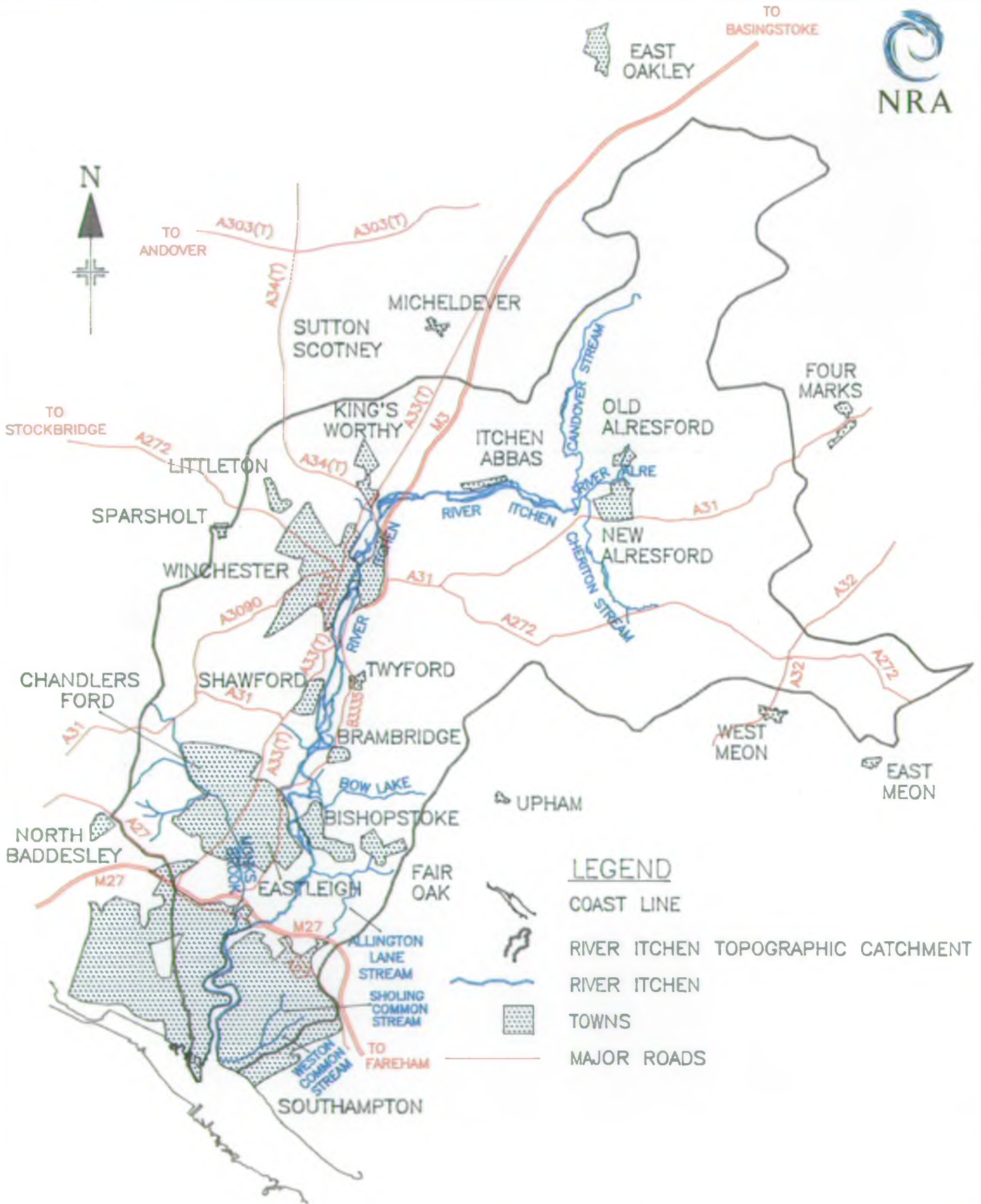
Section E : Management Options

This section sets out MANAGEMENT OPTIONS for the future strategy for the catchment. The options represent the ideas of the Southern Region of the NRA at the time of production of this Consultation Report. They do not represent policy as this will only be finalised following the public consultation process. Comments on the options and suggestions for new ideas are positively encouraged.

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

SECTION A : GENERAL INFORMATION





LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  RIVER ITCHEN
-  TOWNS
-  MAJOR ROADS



THE CATCHMENT

A1. THE CATCHMENT



The River Itchen is one of the best examples of a chalk river. It rises on the Upper Chalk of the Hampshire Downs as three spring fed tributaries; the Candover Stream, the River Alre and the Cheriton Stream (or Tichbourne). These join to form the River Itchen just west of New Alresford. From here the river flows westwards to Winchester, where it collects the Nuns Walk Stream from the north-west, and then turns southwards where Poles Lane Stream joins from the west and Bow Lake from the east. The river flows through the outskirts of Eastleigh and Southampton to the tidal limit at Woodmill. The Monks Brook, which drains a highly urban catchment, joins the estuary just downstream of the tidal limit. This Management Plan covers the catchment of the River Itchen and its estuary upstream of Dockhead, as shown on the accompanying map.

The resident population in the catchment is approximately 250,000, with the main towns being Southampton, Eastleigh and Winchester. Upstream of Eastleigh the catchment is predominantly rural with a combination of arable and livestock farming, whilst downstream the area is urban and includes heavy industry.

For much of its length the River Itchen is divided between two or more separate streams running parallel to each other. These braided streams and cross channels have many structures to regulate flows and levels. Three historic uses of the river gave rise to this multiplicity of channels; the harnessing of water power for milling, the use of water meadow systems to promote the early growth of pasture and the development of the river for navigation.

Traditional industries relying on water power included wool processing, paper making, tanning, flour and grist milling as well as the generation of electricity. The last working mill ceased operation in the 1960s.

Centuries ago the water meadow system was developed to provide farmers with a lush, early crop of spring grass to feed to their livestock. The river water was diverted across the meadows through a network of channels and hatchways. This skilled operation was carried out by "drowners" and gave the meadows a supply of mineral-rich silt and sediment from the river. This process not only provided benefits for the farmers but also filtered-out much of the silt and sediment washed off the upland fields. The labour-intensive nature of the water meadows system, however, led to it becoming unprofitable and eventually being abandoned. The legacy is a network of streams and carriers which were part of the system.

Between Winchester and Eastleigh the former Itchen Navigation flows parallel to or coincident with the river. An Act making the river navigable for boats and barges was passed in the reign of Charles II. Subsequently a new navigation channel was cut from Woodmill to Winchester under Acts of 1792, 1795, 1811 and 1822. This channel fell into disuse many years ago and, although partly filled, can still be traced on large scale maps. There is no public right of navigation above the tidal limit.

The character of the River Itchen owes much to the geology of the catchment. The underlying rocks form part of the northern flank of the Hampshire Basin. The chalk is the oldest rock and outcrops over the whole of the valley to the north of Eastleigh. This forms a large groundwater aquifer providing spring flows which give the river its distinctive character. The upper catchment, typically for a chalk river, has few tributaries and most of the rainfall infiltrates directly into the chalk. Those tributaries which are present are orientated in a right angle grid pattern reflecting the structure of the underlying aquifer. From Eastleigh to the sea the river flows over younger sands, silts and clays which are less permeable than the chalk.

A1. THE CATCHMENT



Much of the landscape of the upper Itchen catchment was sculpted during the last Ice Age. The 'U' shaped chalk valleys, many of which are now dry, were formed by frost action and rapid run-off under the permafrost conditions prevailing at that time.

The chalk aquifer provides the river with a stable flow of cool, clear and hard alkaline water, which is ideal for the development of trout. This provides high quality game fisheries which make the Itchen one of the most famous of all trout streams. Salmon are also caught by both rod and net in the lower reaches.

There are a number of major public groundwater supplies in the catchment, all of which are within the river valley and located along the 10km reach from King's Worthy downstream to the base of the chalk aquifer at Otterbourne. There are also two public surface water supplies, at Otterbourne and Gaters Mill.

Stream support schemes have been installed on both the Candover and Alre tributaries. These operate by pumping groundwater from boreholes in the upstream dry valleys to the headwaters of these streams. The Candover scheme was developed to support the abstraction at Gaters Mill during periods of drought, although it provides benefits to the river in the intervening reaches. The Alre scheme has yet to be commissioned and brought into operation.

There is a thriving cress industry in the Alresford area, supplied by artesian springs and boreholes. Fish farming is also an important industry with four major farms located adjacent to the river or its tributaries. Both of these industries abstract large volumes of water, but this is continuously fed through the farms and discharged back to the river with minimal losses.

With their stable flow of cool, well oxygenated water, chalk streams have a high capacity for the assimilation of effluent discharges. This capacity is important in South Hampshire where there has been continuing development based on good communication links. The urban and industrial nature of the Monks Brook catchment has been known to cause intermittent water quality problems.

Flood defence is not a particularly important issue along the main River Itchen and there are no flood defence schemes in operation. It is very rare for any properties to flood but low-lying water meadows are subject to regular inundation. Flooding from the Monk's Brook used to be a major problem in Chandlers Ford and Eastleigh, but this has now been resolved by the construction of flood alleviation schemes in these areas.

A range of typical statistics for the Itchen Plan catchment are set out in Table A1.1 on the following pages.

TABLE A1.1 : STATISTICS FOR THE ITCHEN PLAN CATCHMENT



1. GENERAL

Surface Catchment Area	45460 Ha (454.6 km ²)		
Groundwater Catchment Area	61470 Ha (614.7 km ²)		
Topography:	Maximum Level	234 mAOD	
	Minimum Level	0 mAOD	
Length of Statutory Main River	95 km		
Geology :	Chalk	80%	
	Barton & Bagshot Beds	13%	
	London Clay	6%	
	Woolwich & Reading Beds	1%	
			<u>Change per decade</u>
Estimated Resident Population	-	1981 = 235,000	
within the Itchen catchment	-	1991 = 245,000	+ 5 %
	-	2001 = 250,000	+ 2 %
Main Towns and Estimated Resident Population			
	Winchester	-	1991 = 30,000
	Eastleigh	-	1991 = 55,000
	Southampton	-	1991 = 110,000

Note: The population figures are approximate only and portray overall figures and trends rather than precise values.

2. WATER RESOURCES



Item	Resource Areas		Total Catchment
	Upper Itchen (32)	Lower Itchen (31)	
Surface catchment area (Ha)	15950	29510	45460
Groundwater catchment area (Ha)	27910	33560	61470
Annual Rainfall (mm) :			
Mean Year	914	836	874
1:10 year Drought	731	669	699
Effective Rainfall (mm):			
Mean Year	448	370	408
1:10 year Drought	286	226	255
Licensed Abstraction (Ml/day):			
Public Supply			
Surface Water	0	91	91
Ground Water	19	113	132
Industrial and Agricultural Supply	106	26	132
TOTAL	125	230	355
Actual Abstraction (1989) as percentage of Total Licensed Abstraction:	47	56	53
Actual Consumptive Abstraction (1989) as percentage of available resource:			
Mean Year	5	14	15
1:10 Year Drought	8	22	25
River Flow at downstream gauging station (cumeecs):			
Mean Flow	2.7	5.3	-
95 percentile Flow	1.6	3.0	-
Water Supply Companies: (Name & Area (Ha))			
Southern Water Plc	-	-	36620
Portsmouth Water Company	-	-	860
Mid Southern Water Company	-	-	7980

3. WATER QUALITY



Length of river (km) designated under EC Directives:

EC Freshwater Fisheries Directive	-	Salmonid	:	51.13 Km
	-	Cyprinid	:	0 Km

Length of river (km) in each NWC Classification Objective :

Category 1A	-	Good	:	60.6
Category 1B	-	Good	:	30.8
Category 2	-	Fair	:	6.3
Category 3	-	Poor	:	0
Category 4	-	Bad	:	0

Length of river (km) achieving each NWC Classification Objective at last National Survey (1990):

Category 1A	-	:	79.4
Category 1B	-	:	16.2
Category 2	-	:	2.1
Category 3	-	:	0
Category 4	-	:	0

4. CONSERVATION

Number of water-dependent, designated sites in the catchment :

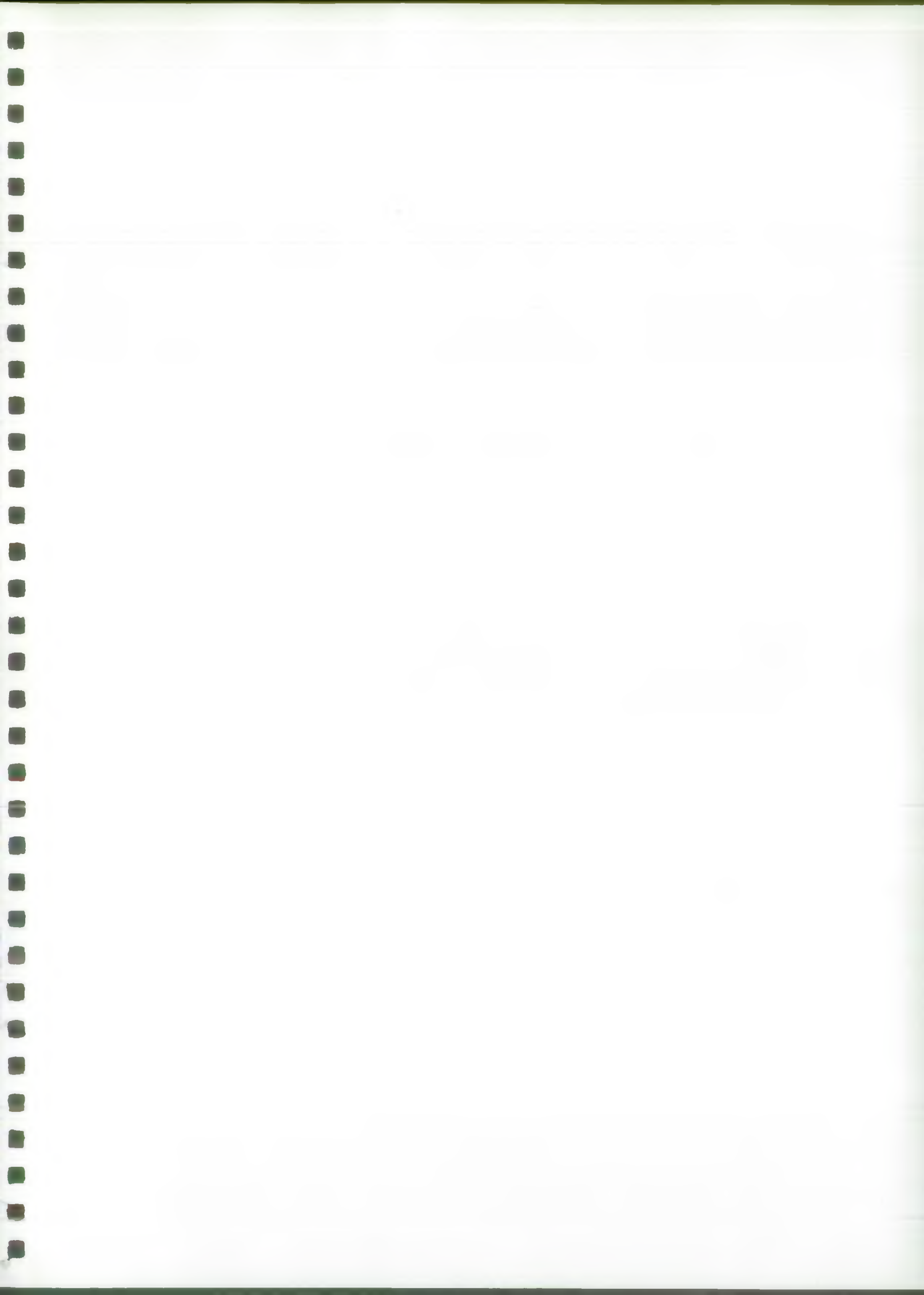
<u>Type</u>	<u>No</u>
Ramsar Sites	None
NNRs	None
SSSIs	5
LNRs	2
SNCIs	5 (Taken as HCC Countryside Heritage Sites)

5. ADMINISTRATION

County & District Councils	Area in Catchment		Resident Population in Catchment			Development to 2001*	
	(Ha)	% of Total	1991		2001	Housing (No)**	Industry (Ha)
			No.	% of Total	% increase from 1991		
Hampshire:	45460	100	245,000	100	+2.0		
Winchester	29190	64	60,000	24	+1.0	3,150	40.0
Eastleigh	4380	10	70,000	28	-0.5	3,950	36.5
Southampton	2620	6	110,000	45	+3.0	5,350	44.5
Basingstoke and Deane	4720	10	<5,000	<1	0.0		
Test Valley	1470	3	5,000	2	0.0		
East Hampshire	3080	7	<5,000	<1	0.0		
TOTALS	45460	100	245,000			12,450	121.0

* This relates to the entire District Council area, not just that portion falling within the catchment. For this reason only the figures for the main Districts are given.




** The housing figures are derived from the Draft Hampshire Structure Plan and relate to additional dwellings only.





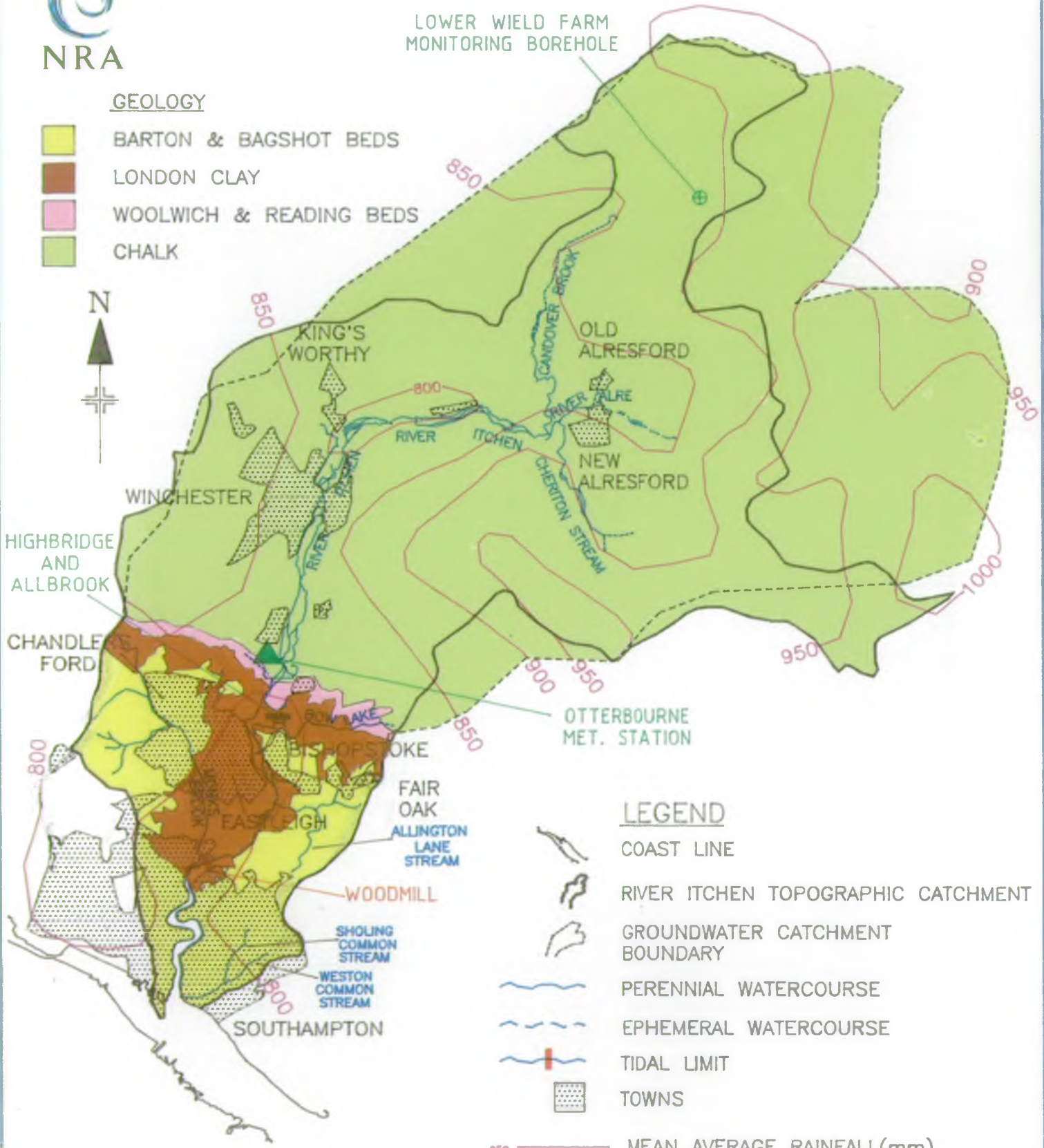
NRA

GEOLOGY










-  BARTON & BAGSHOT BEDS
-  LONDON CLAY
-  WOOLWICH & READING BEDS
-  CHALK



LOWER WIELD FARM MONITORING BOREHOLE



LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  GROUNDWATER CATCHMENT BOUNDARY
-  PERENNIAL WATERCOURSE
-  EPHEMERAL WATERCOURSE
-  TIDAL LIMIT
-  TOWNS
-  MEAN AVERAGE RAINFALL(mm)
-  MAIN GAUGING STATION



CATCHMENT HYDROLOGY & HYDROGEOLOGY

A2. HYDROLOGY AND HYDROGEOLOGY

A.1 General

This section considers the main features of the natural water resources within the catchment. A proportion of rainfall is lost through direct evaporation and transpiration from plants and trees. The remainder is termed the effective rainfall and is the total available water resource to the catchment. This resource may manifest itself as immediate surface run-off to streams and rivers or as recharge to the groundwater aquifer.

The allocation of effective rainfall between surface and groundwater is largely dependent on the nature of the surface geology. Low permeability clay and silt areas result in a high run-off component to a well developed surface drainage system. Chalk and some sand catchment areas allow a higher proportion of recharge to groundwater. Consequently, the surface drainage system is less well developed and a large part of the river flow is derived by outflow from the groundwater aquifer. This can occur from springs or through the bed of the river and is known as baseflow.

Surface flows in clay catchments respond rapidly to both high rainfall and drought periods. The water resource available at a river intake shows considerable seasonal variation. These catchments are referred to as flashy in character. The water supply can be enhanced by the construction of reservoirs to store water abstracted during the periods of high flow.

Groundwater aquifers provide a natural storage system for the catchment. Groundwater systems react much more slowly to rainfall and generally provide a more reliable resource during drought periods. Recovery from drought periods may also take longer however. These catchments are considered to be baseflow controlled.

A2.2 Local Perspective

The River Itchen rises as three spring fed tributaries, the Candover, the Alre and the Cheriton Stream, which meet just west of New Alresford and flow westwards as the River Itchen. Each of the three sub-catchments is gauged just upstream of the confluence and the River Itchen is gauged again seven kilometres further downstream at Easton. The upstream chalk groundwater catchment is approximately 130km² larger than the topographic catchment, extending eastwards beneath the topographic catchment of the River Wey on the far side of the Hampshire Downs ridge. The size of the chalk groundwater catchment feeding the upper reaches of the Itchen is reflected in the high baseflows to each stream, particularly the Alre which records a mean flow of 137M/d at Drove Lane gauging station, just 4.5km below the perennial spring line. The flow accretion between Alresford and the Easton gauge is also large with the mean flow increasing by over 100M/d in seven kilometres.

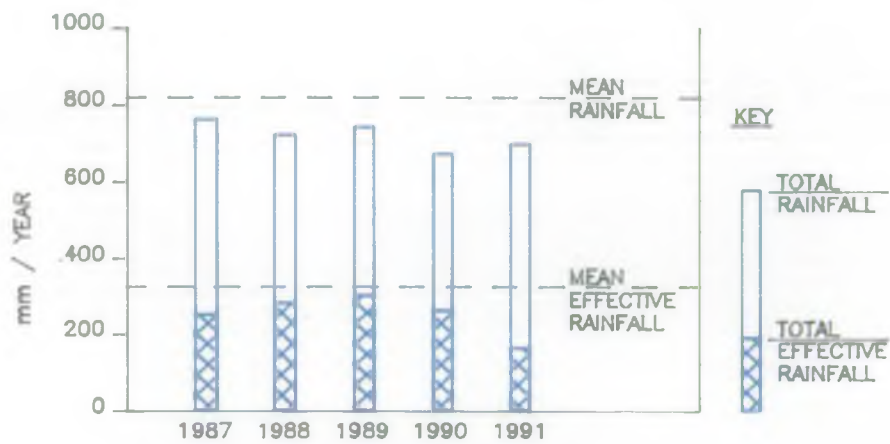
The river turns south through Winchester to the downstream limit of the chalk catchment at Highbridge and Allbrook, where there is a further gauging station. The hydrograph for this gauge is illustrated on the attached sheet and shows a very unresponsive catchment with a high baseflow component, typical of a chalk river. South of the gauge the river flows across the variable sand and clay sequences of the Bagshot Beds which have little influence on the catchment flow characteristics in dry weather.

A2. HYDROLOGY AND HYDROGEOLOGY

A2.3 Recent Meteorological Conditions

The average annual rainfall across the catchment is fairly constant, varying from 800mm on the south coast up to 1000mm in the northern downland. The actual rainfall has been below average at Otterbourne meteorological station for each of the last 5 years and approximately 90 per cent of the mean annual total. The effective rainfall has also been below average over the same period, at approximately 75 per cent of the mean. The 38 month rainfall total for the entire Southern Region from November 1988 to January 1992 has been assessed by the Meteorological Office as representing a drought of greater than 1 in 50 year severity. The severity of the drought is reflected in the surface flow hydrograph for Highbridge and Allbrook and the chalk groundwater levels, as recorded at Lower Wield Farm. The surface flows over the period from May 1989 to January 1992 are the lowest on the 31 years of record and the groundwater level has remained below the mean for much of the last 5 years, recording minimum levels on four separate occasions.

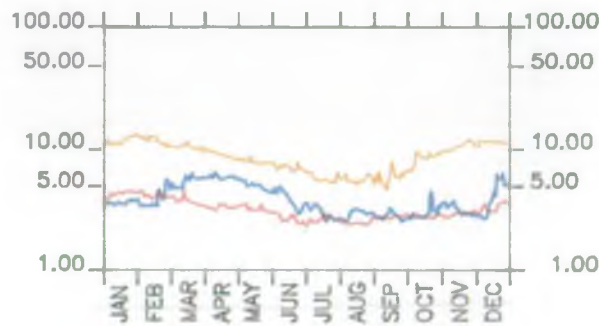
There are two augmentation schemes in the upper reaches of the Itchen, on the Alre and Candover tributaries. These operate by pumping groundwater into the river during extreme low flow periods to support downstream river flows, although the Alre scheme has yet to be commissioned. The Candover scheme, which operated in 1989 and 1990, is considered to have had a significant beneficial effect, maintaining dilution for effluent and supporting the abstraction at Gaters Mill.



Rainfall Record from Otterbourne Station
Actual Evaporation Data from MORECS Database

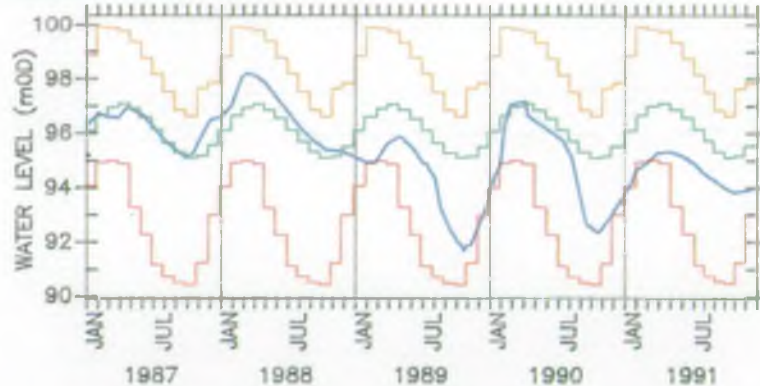
DAILY FLOW HYDROGRAPH ($m^3 s^{-1}$)

Max. and min. daily mean flows from 1958 to 1990 with an example yearly hydrograph (1990)



HIGHBRIDGE AND ALLBROOK

Site name : LOWER WIELD FARM
National grid reference : SU 8380 4049
Well number : SU84/28
Aquifer : CHALK AND UPPER GREENSAND
Measuring level : 158.95



Max, Min and Mean values calculated from years 1958 to 1989

HYDROMETRIC DATA



BASINGSTOKE AND DEANE DISTRICT

WINCHESTER DISTRICT

EAST HAMPSHIRE DISTRICT

TEST VALLEY DISTRICT

KING'S WORTHY

OLD ALRESFORD

WINCHESTER

RIVER ITCHEN

ALRE

NEW ALRESFORD

CHANDLERS FORD

BOW LAKE

BISHOPSTOKE

FAIR OAK

SOUTHAMPTON DISTRICT

EASTLEIGH

ALLINGTON LANE STREAM

SHILING COMMON STREAM

EASTLEIGH DISTRICT

SOUTHAMPTON

WESTON COMMON STREAM

LEGEND



COAST LINE



RIVER ITCHEN TOPOGRAPHIC CATCHMENT



RIVER ITCHEN



TOWNS



DISTRICT BOUNDARY



EXTENT OF EAST HAMPSHIRE AONB
NORTH WESSEX DOWNS AONB



APPROXIMATE EXTENT OF PROPOSED
SOUTH HAMPSHIRE GREEN BELT



INTERACTIONS WITH PLANNING AUTHORITIES

A3. INTERACTIONS WITH PLANNING AUTHORITIES



A3.1 General

In taking decisions regarding particular developments, the Town and Country Planning Act 1990 requires that planning authorities should have regard to the contents of relevant development plans. The Planning and Compensation Act 1991 specifically states that decisions are to be in accordance with the plan, unless material considerations indicate otherwise. The 1991 Act requires the preparation in non-metropolitan areas of the following plans:

- i) **County Structure Plan.** This provides the broad strategic planning framework and should ensure that the provision for development is realistic and consistent with national and regional policy. The Structure Plan policies are not required to be site specific.
- ii) **District or Local Plan.** This plan sets out detailed policies and specific proposals for the development and use of land. The local plan should be in general conformity with the Structure Plan and make proposals for specific allocations of land as well as setting out the policies for the control of development.
- iii) **Minerals Local Plan.** The exploitation of mineral resources within the catchment can impact upon it in a number of ways. The extraction of sands and gravels from a river valley can have a significant effect on the river corridor and its associated flood plain. Mining activities can be a source of pollution either during operation or following closure and subsequent flooding of the mine. Finished mineral workings can provide important conservation or amenity sites, but can also be a further cause of concern if they are used as solid waste disposal sites. Although County Structure Plans will address broad strategies, the Minerals Local Plan should cover these in more detail. It should indicate the areas where provision is made for mineral working and the disposal of mineral wastes as well as areas where mineral resources are to be safeguarded for future working. The plans should set out development control criteria and requirements for the restoration and aftercare of sites.
- iv) **Waste Local Plan.** The 1974 Control of Pollution Act places a duty on the Waste Disposal Authority to licence disposal sites and ensure that the sites do not endanger public health, cause water pollution or cause serious detriment to the local amenity. The 1990 Environmental Protection Act also introduced stricter controls on the closure and aftercare of waste disposal sites. A waste disposal operator will have to acquire a certificate of completion from the Waste Disposal Authority before they are able to hand back their licence and exonerate themselves of any further legal responsibility. The Waste Disposal Authority can either integrate waste disposal policies into the Minerals Local Plan or prepare a separate Waste Local Plan. The Plan should examine land use implications and identify suitable locations for further facilities.

Within all the development plans outlined above proper provision should be made for the needs of the utilities responsible for water supply, sewerage, electricity, gas and telecommunications as well as the National Rivers Authority with all its areas of responsibility. The Town and Country Planning (Development Plan) Regulations 1991 require local authorities to consult a number of bodies before putting plans on deposit. These include the National Rivers Authority, and it is at this stage that planning authorities will wish to resolve points of concern so as to minimise objections once the plan is on deposit.

A3. INTERACTIONS WITH PLANNING AUTHORITIES



A3.2 Local Perspective

A3.2.1 Housing and Employment

The Itchen catchment is situated wholly in the County of Hampshire and predominantly in the Districts of Winchester, Eastleigh and Southampton, with small areas located within the Districts of Basingstoke and Deane, East Hampshire and Test Valley. Based on Hampshire County Council forecasts and preliminary figures from the 1991 census, the resident population in the catchment is approximately 245,000. This has increased by about 5% since 1981 and is projected to increase by about 2% over the next ten years. The main towns are Winchester (population of 30,000), Eastleigh (55,000) and Southampton (110,000 in the catchment).

Currently there are four Hampshire Structure Plans, with the Itchen catchment falling within the South and Mid Hampshire Plan Areas. A Structure Plan covering the whole county was published in draft form in September 1990 and will eventually replace the other four Structure plans. The draft plan seeks to calm the rates of development that took place in the 1980s and to prevent further large-scale suburban development and the loss of greenfield sites.

The draft plan provides for 46,950 additional dwellings in Hampshire between April 1990 and March 2001, based on the assumption that the house-building rates will decline from around 8,000 to 3,500 dwellings per year.

The countywide provision is significantly below the figure proposed in the Regional Guidance for the South-East of 66,500 for Hampshire. The County proposes to make up the difference by allowing for the contribution made by infill and redevelopment sites.

With regard to employment land there are no major new allocations for industrial development and no promotion of additional office floorspace. The existing commitments, at January 1990, as well as the proposed additional dwellings and contribution from infill and redevelopment to 2001 in the main districts relevant to the Itchen catchment are as follows:

District	Infill and redevelopment (No.)	Additional dwellings (No.)	Employment Land (m ²)
Eastleigh	600	3,950	365,000
Southampton	1,750	5,350	445,000
Winchester	750	3,150	400,000

A3. INTERACTIONS WITH PLANNING AUTHORITIES



The other policies of note in the submitted Structure Plan include the designation of a Southern Hampshire Green Belt extending northwards to Winchester, with countryside policies applying to all other non-built up areas.

Two of the five growth sectors identified in the South Hampshire Structure Plan are located in the Itchen catchment. These are Chandlers Ford and Hedge End North where a further 2,600 and 2,500 dwellings respectively are proposed between 1982 and 1996.

With regard to employment the same two growth areas are relevant, with 10 Ha proposed at Chandlers Ford and 28 Ha at Hedge End North.

The Mid-Hampshire Structure Plan indicates that a total of 1,400 additional dwellings would be provided in Winchester district between 1991 and 2001, which recognises the potential for additional dwellings in King's Worthy.

A3.2.2 Waste Disposal

In the case of the Itchen catchment, the Waste Disposal Authority is Hampshire County Council. In 1989 the County Council produced the Hampshire Waste Management Plan which stated that one of the main intentions is to reduce the output of waste which currently stands at 3 million tonnes per year. A further area of concern outlined in the plan is the increasing difficulty in locating environmentally acceptable landfill sites, as well as the need to upgrade or replace the ageing household waste incinerators.

Due to the shortage of acceptable landfill sites in Hampshire, other methods of waste disposal such as incineration in waste-to-energy plants or rail transfer outside the county are considered suitable alternatives. It remains clear, however, that the protection of water resources will remain of paramount importance in deciding applications for waste disposal, and full consultation with the NRA is essential.

A3.2.3 Minerals

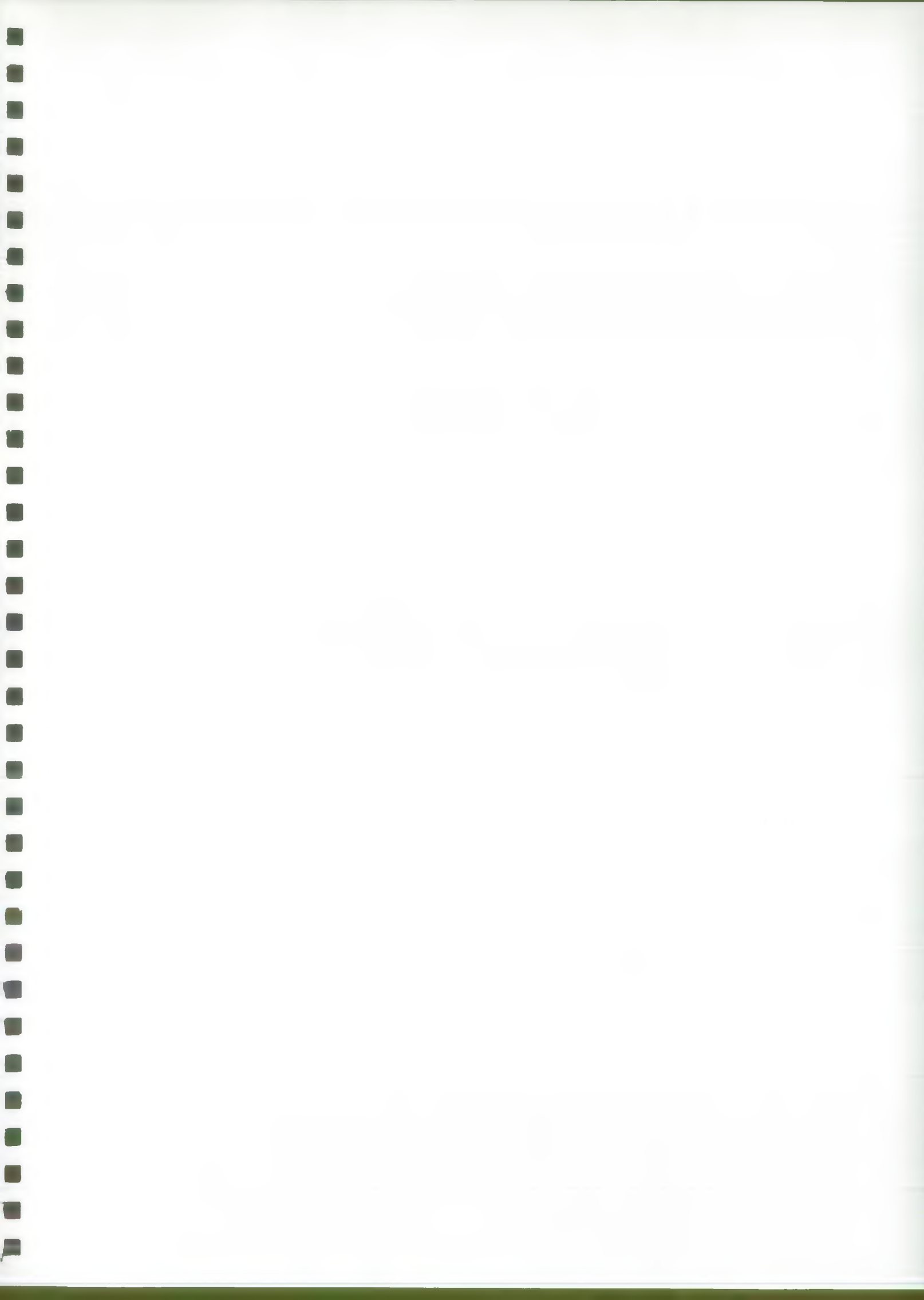
The County Council's Hampshire Minerals Local Plan, which was adopted in 1987, includes detailed policies on aggregates, chalk and clay. The main guidelines are to conserve and to ensure that the best use is made of mineral resources and to increase the use of substitute aggregate materials.

It is generally agreed that sites where mineral working can be carried out in an environmentally acceptable manner are now becoming scarce and the county maintains its stance that permission for mineral exploration will not be permitted in SSSIs, Nature Reserves, Countryside Heritage Sites or other areas which are of ecological, landscape or historical importance.

The County Council is preparing a Hampshire Minerals and Waste Local Plan to cover the period up to 2001. This will provide a more detailed assessment of the land use implications of the demand for waste disposal and mineral workings within the next decade.

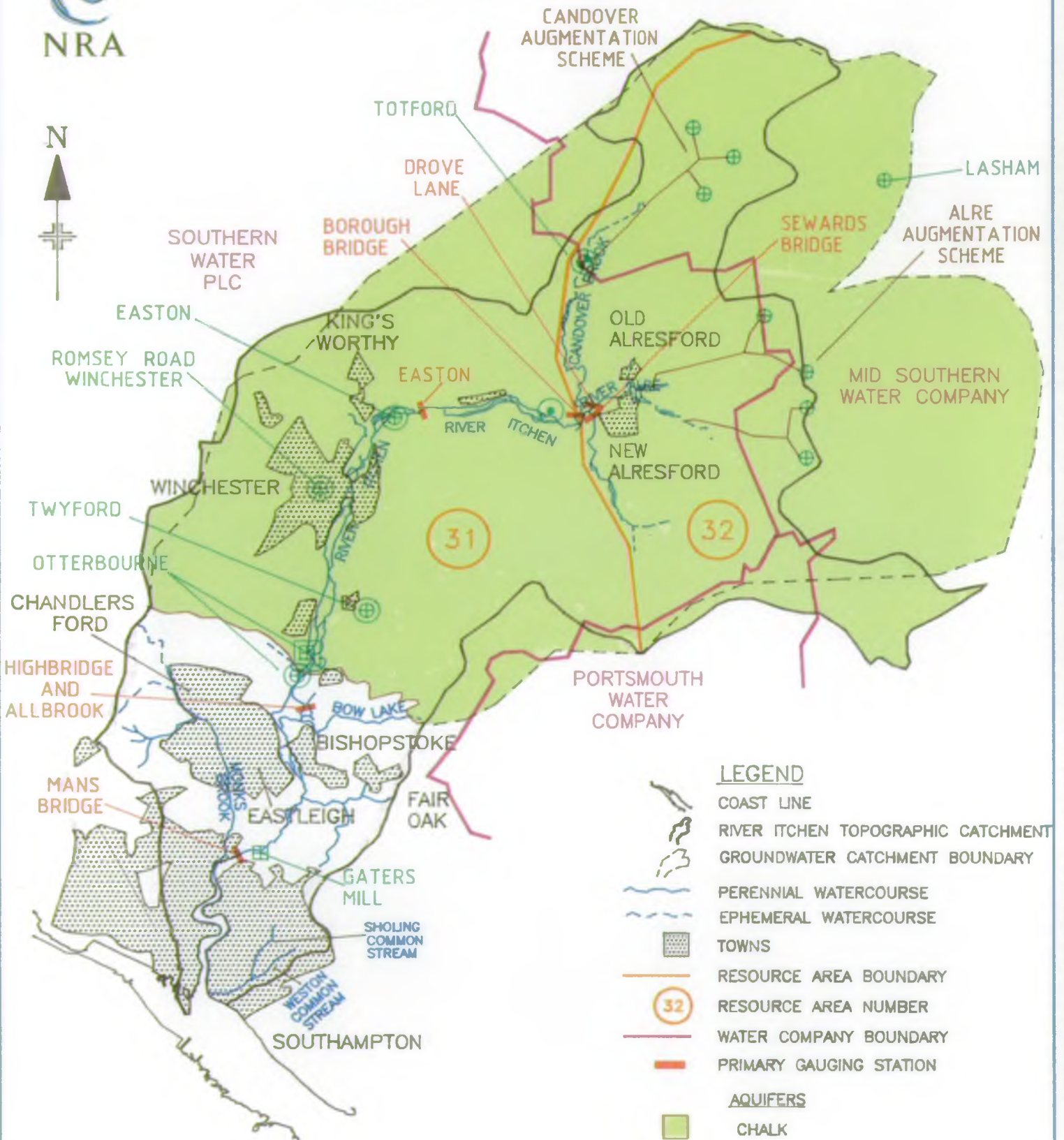
RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

SECTION B : USES





PUBLIC WATER SUPPLY



LEGEND

- COAST LINE
- RIVER ITCHEN TOPOGRAPHIC CATCHMENT
- GROUNDWATER CATCHMENT BOUNDARY
- PERENNIAL WATERCOURSE
- EPHEMERAL WATERCOURSE
- TOWNS
- RESOURCE AREA BOUNDARY
- RESOURCE AREA NUMBER
- WATER COMPANY BOUNDARY
- PRIMARY GAUGING STATION
- AQUIFERS**
- CHALK

LICENSED PUBLIC SURFACE WATER SOURCES

LICENCE OF RIGHT	LICENCE ISSUED SUBSEQUENTLY
OTTERBOURNE > 5Mld	GATERS MILL > 5Mld

LICENSED PUBLIC GROUNDWATER SOURCES

LICENCE OF RIGHT	LICENCE ISSUED SUBSEQUENTLY
TWYFORD > 5Mld	LASHAM > 5Mld
1-5Mld	1-5Mld
< 1Mld	< 1Mld



B1. PUBLIC WATER SUPPLY



B1.1 General

This use relates to the provision of public water supplies from both surface and ground waters. Abstractions are operated by the Water Companies, controlled by a licence from the NRA which stipulates the maximum allowable annual and daily abstraction. The mean licensed abstraction is the average daily abstraction allowable under the annual licence. Private groundwater supplies for potable use are also included, although these are generally very small and not significant from the resources standpoint.

Those water supply sources in use before 1963 were granted Licences of Right under the Water Resources Act (1963). Since then, new sources have been licensed on the basis that abstraction does not adversely affect existing sources or impair the natural environment. Licences issued after 1964 can be linked to Prescribed Flows such that abstraction must cease once the river flow falls below the prescribed value.

Prescribed Flows (PFs) can be increased in stages so as to preserve both a minimum residual flow (mrf) and the rights of existing licence holders. Mrfs can be set at gauging stations and are intended to protect flows for other uses. PFs can thus control abstractions but do not control the river flows. Compensation flows may be set into licence conditions such that abstractions from groundwater or releases from a reservoir are used to augment low river flows.

Water companies may apply for a Drought Order to vary the licence conditions during periods of exceptional shortage. This may include the reduction of the Prescribed Flow controlling abstraction and/or a temporary increase to the maximum licensed abstraction. The terms of the Drought Order may require the water company to introduce demand reduction measures, such as hose-pipe bans, at the same time.

B1.2 Local Perspective

The Itchen catchment is divided into two resource areas and the total licensed abstraction from each is listed on Table B1.1 in terms of the mean daily abstraction for both surface and groundwater sources. The total actual abstraction in a typical year (1989) is also listed as a percentage of licensed abstraction.

TABLE B1.1 - Mean Licensed and Actual Abstractions for Public Water Supply

Resource Area	Mean Licensed Abstraction (Ml/d)			Mean Actual Abstraction for a Typical Year (1989) (% Licensed)		
	Surface	Groundwater	Total	Surface	Groundwater	Total
32 UPPER ITCHEN	0.0	18.6	18.6	-	*	*
31 LOWER ITCHEN	91.2	112.9	204.1	*	67	*
TOTAL CATCHMENT	91.2	131.5	222.7	*	*	59

* Actual abstractions not revealed as they could be identifiable to a single source.
However all values are included in the total.

B1. PUBLIC WATER SUPPLY



B1.2.1 Surface Water Sources

There are two surface water abstractions for public supply on the River Itchen: Otterbourne in the central part of the catchment (operated by Southern Water Services) and Gaters Mill located close to the tidal limit (operated by Portsmouth Water Company).

The Otterbourne intake is licensed for a maximum mean daily abstraction of 45MI/d and, along with two major nearby groundwater pumping stations, is known to cause reduced flows downstream.

The Gaters Mill intake is licensed for a maximum mean daily abstraction of 45MI/d.

A discharge of 20MI/d enters the Itchen from Eastleigh sewage treatment works, upstream of Gaters Mill intake. A minimum residual flow at Allbrook of 240MI/d has been set in part to provide sufficient dilution for this effluent return. The minimum residual flow required downstream of Gaters Mill has been set at 86.4 MI/d to protect water quality in the estuary and fish migration. However, both Otterbourne and Gaters Mill abstractions have Licences of Right which are not related to a Prescribed Flow.

B1.2.2 Groundwater Sources

There are four major licences for groundwater abstraction for public water supply in the Itchen catchment, each controlling a number of supply boreholes. Otterbourne and Twyford pumping station licences relate to a total of seven supply boreholes operating along a three kilometre reach of the Itchen valley. The total licensed abstraction from the sources is 93.7MI/d and, including the surface water abstraction from the Otterbourne intake, the total licensed abstraction from the reach is almost 140MI/d. Both Otterbourne and Twyford pumping stations are Licences of Right under the 1963 Water Act and are not related to prescribed flows.

The Easton and Romsey Road Sources consist of three boreholes located between Kings Worthy and Winchester and are controlled by a single licence. The total licensed abstraction is 18.2MI/d and has some effect upon surface flows, particularly during drought conditions.

Lasham pumping station is outside the surface catchment of the Itchen and falls within the Thames Region of the NRA. The licence controls the operation of 3 boreholes in the River Wey surface catchment but which intercept groundwater flow within the Candover groundwater catchment. The mean daily licensed abstraction was reduced in 1990 from 20.5MI/d to 14.9MI/d, partly in response to concern over the effects of abstraction on baseflow to the Candover Stream. The abstraction at Totford (4.5MI/d) has a significant effect upon the perennial head of the Candover Stream, and where there were springs and watercress beds there is now a dry channel. The Candover Augmentation Scheme includes an outfall below the pumping station which can provide a compensation flow during drought periods.

The actual abstraction from the Itchen catchment in 1989 was approximately 70 per cent of the licensed total. This does not necessarily mean that there is an additional resource available at the existing sources as the volumes authorised by Licences of Right are not always attainable.

B1. PUBLIC WATER SUPPLY



B1.3 Supply Requirements

Water Resources

- Maximum availability of resources within the terms specified in the licence.
- Protection of existing public and private water supply abstractions.

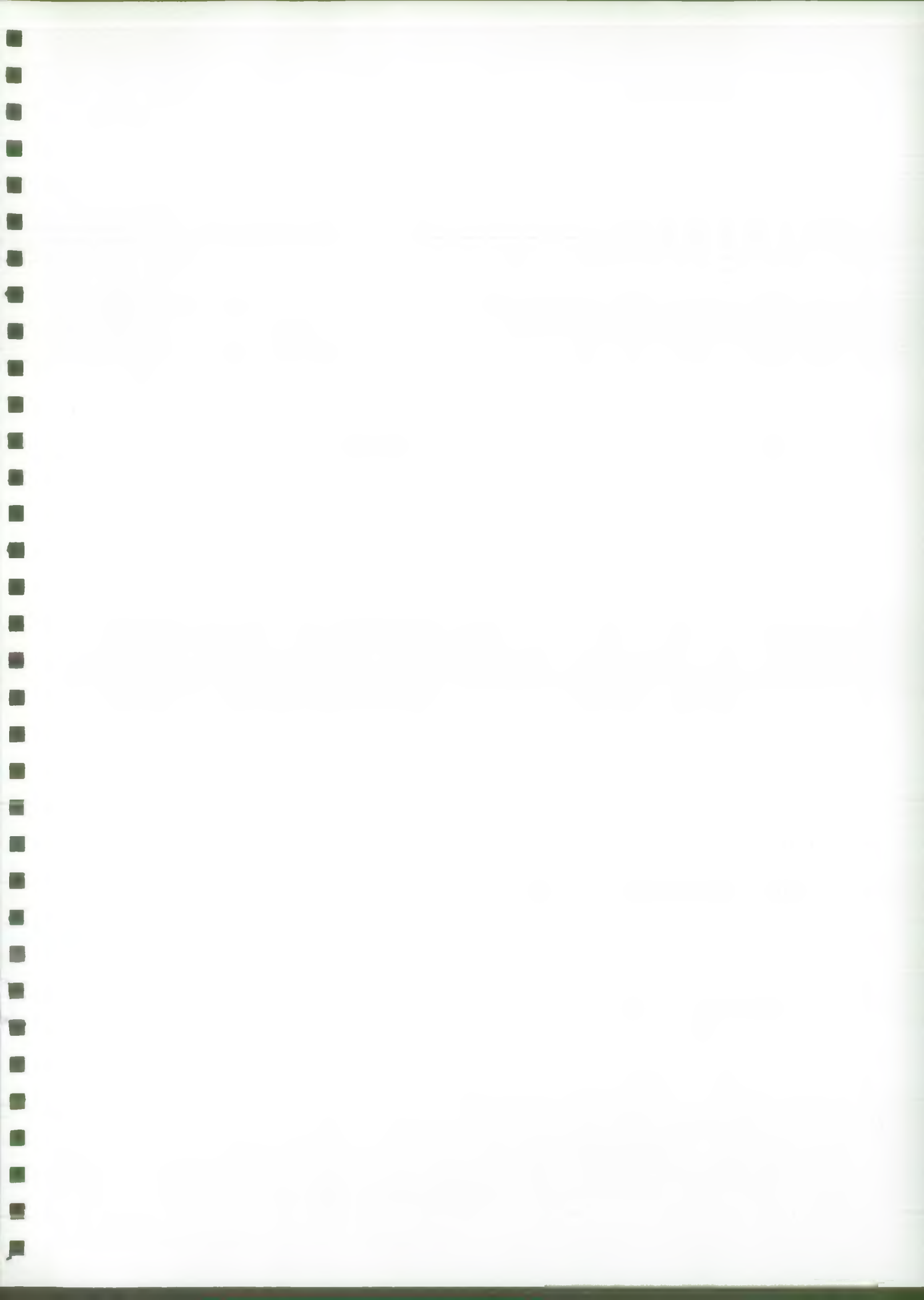
Water Quality

- Surface sources within the limiting values defined for A2 Category Treatment (EC Council Directive 75/440/EEC)
- Groundwater sources. Not Specified. Chalk sources generally within the limiting values for A1 Category treatment. (Council directive 75/440/EEC).

Southern Water Authority produced an Aquifer Protection Policy (APP) in 1985 whose purpose was to define appropriate protection zones around supply sources and for each groundwater aquifer in order to control land use activities which may pollute the resource. Among the types of land use for which controls are set are solid and liquid landfill, quarrying, reclamation and development of contaminated land, soakaways, septic tanks and sludge spreading to land. Five levels of protection are set, of which the strictest, Zone 1, is defined as the area within 50 days groundwater travel time of a significant groundwater supply source. The division of the catchment into the five zones is illustrated in Section B7 : INTERMITTENT AND DIFFUSE POLLUTION. A National Groundwater Protection Policy is currently being developed by the NRA. This policy is likely to develop upon the principles within the existing APP.







River Management

- Control weed growth local to gauging stations to ensure an accurate flow record for control purposes.



INDUSTRIAL & AGRICULTURAL ABSTRACTION

LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  GROUNDWATER CATCHMENT BOUNDARY
-  PERENNIAL WATERCOURSE
-  EPHEMERAL WATERCOURSE
-  TOWNS

— RESOURCE AREA BOUNDARY




32 RESOURCE AREA NUMBER

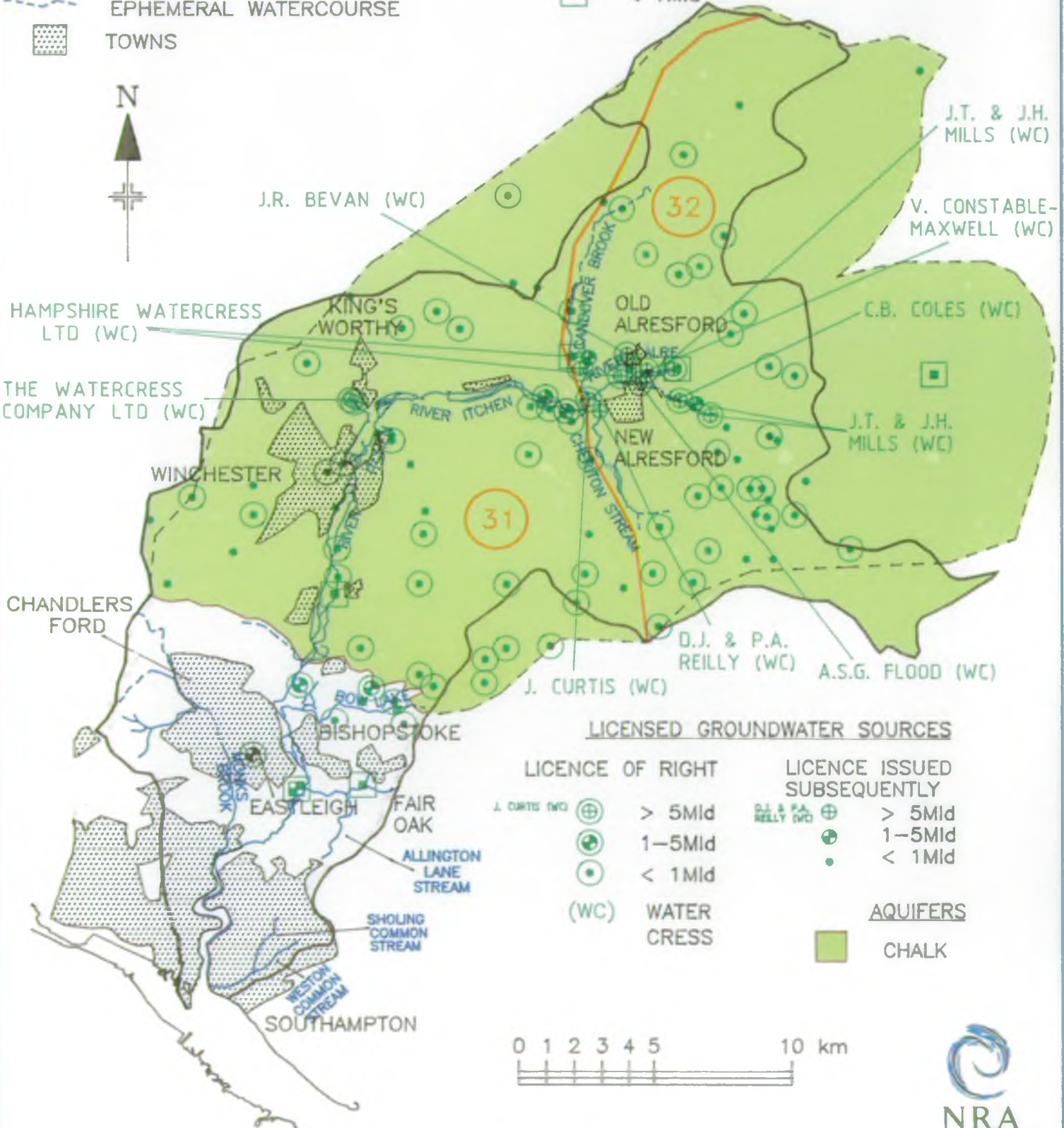
LICENSED SURFACE WATER SOURCES

LICENCE OF RIGHT

-  > 5Mld
-  1-5Mld
-  < 1Mld

LICENCE ISSUED SUBSEQUENTLY

-  > 5Mld
-  1-5Mld
-  < 1Mld



LICENSED GROUNDWATER SOURCES

LICENCE OF RIGHT

-  > 5Mld
-  1-5Mld
-  < 1Mld

LICENCE ISSUED SUBSEQUENTLY

-  > 5Mld
-  1-5Mld
-  < 1Mld

(WC) WATER CRESS

AQUIFERS

 CHALK



B2. WATER SUPPLY FOR INDUSTRY AND AGRICULTURE



B2.1 General

This use deals with surface and groundwater supplies abstracted for industrial and agricultural purposes. Industrial abstractions include all licensed supplies for industrial process uses, cooling water and gravel washing. Agricultural abstractions include all supplies for spray irrigation and general agricultural use.

B2.2 Local Perspective

The total licensed abstraction from each of the two resource areas is given in Table B2.1 in terms of the mean daily abstraction for both surface and groundwater sources. The total actual abstraction in a typical year (1989) is also listed as a percentage of licensed abstraction. Abstraction details for individual sources are confidential so only the totals per resource area are included.

Table B2.1
Mean Licensed and Actual Abstractions for
Water Supply for Industry and Agriculture

Resource Area	Mean Licensed Abstraction (Ml/d)			Mean Actual Abstraction for a Typical Year (1989) (% Licensed)		
	Surface	Groundwater	Total	Surface	Groundwater	Total
32 UPPER ITCHEN	0.1	105.7	105.8	14	39	39
31 LOWER ITCHEN	1.9	24.3	26.2	58	60	60
TOTAL CATCHMENT	2.0	130.0	132.0	56	43	43

There are over 100 licences in this category, of which three quarters are small groundwater abstractions for agricultural and domestic use, amounting to less than 5 per cent of the total licensed volume. The large number of these licences is due to the continued good quality of the chalk groundwater and the rural nature of the catchment, as farms have traditionally operated their own boreholes. A further 8 surface water licences are operated largely for spray irrigation, accounting for less than one per cent of the licensed total.

By far the largest use is for water cress farming with a licensed abstraction of 122Ml/d, over 90 per cent of the total. All cress growers operate under the Cress Growers Code of Conduct which stipulates, for reasons of water quality, that the cress beds are fed by either springs or groundwater. Eight of the licences and most of the cress growing are in the Alre sub-catchment. A further three licences are located in the Cheriton and Candover sub-catchments with the remainder within the main Itchen upstream of Winchester. Cress growing is essentially a non-consumptive use of the resource as the outflow is fed into the adjacent river or stream. However, the groundwater abstractions are large and these may reduce river flows upstream of the cress farm.

B2. WATER SUPPLY FOR INDUSTRY AND AGRICULTURE



There are only four industrial abstractions from the catchment, all of which are less than 2Ml/d and three of which are non-consumptive for gravel washing and cooling purposes.

Fish farms also require a licence to abstract water from the river. There are four farms in the Itchen catchment and these are discussed in more detail in Section B3 : AQUATIC AGRICULTURE.

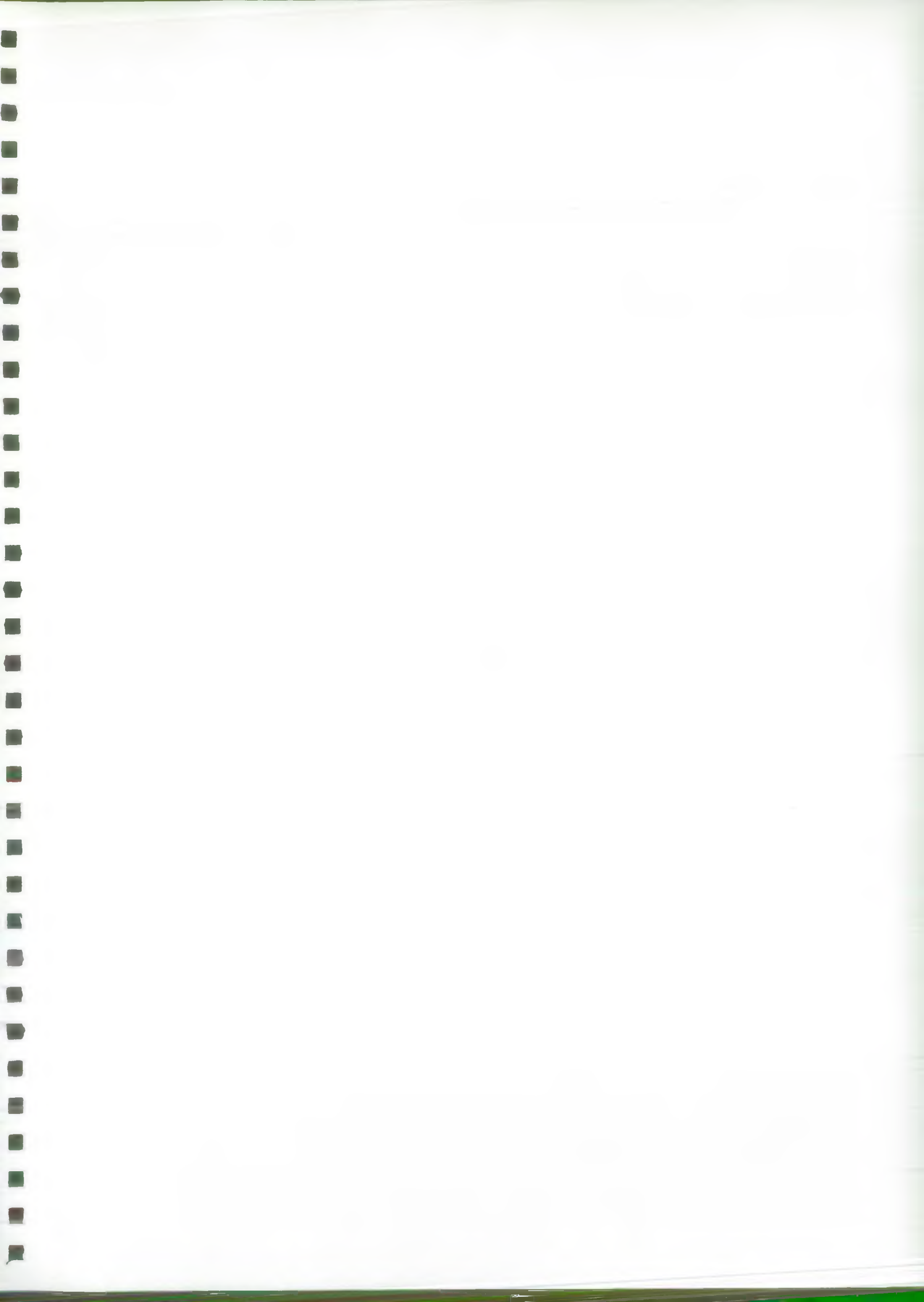
B2.3 Supply Requirements

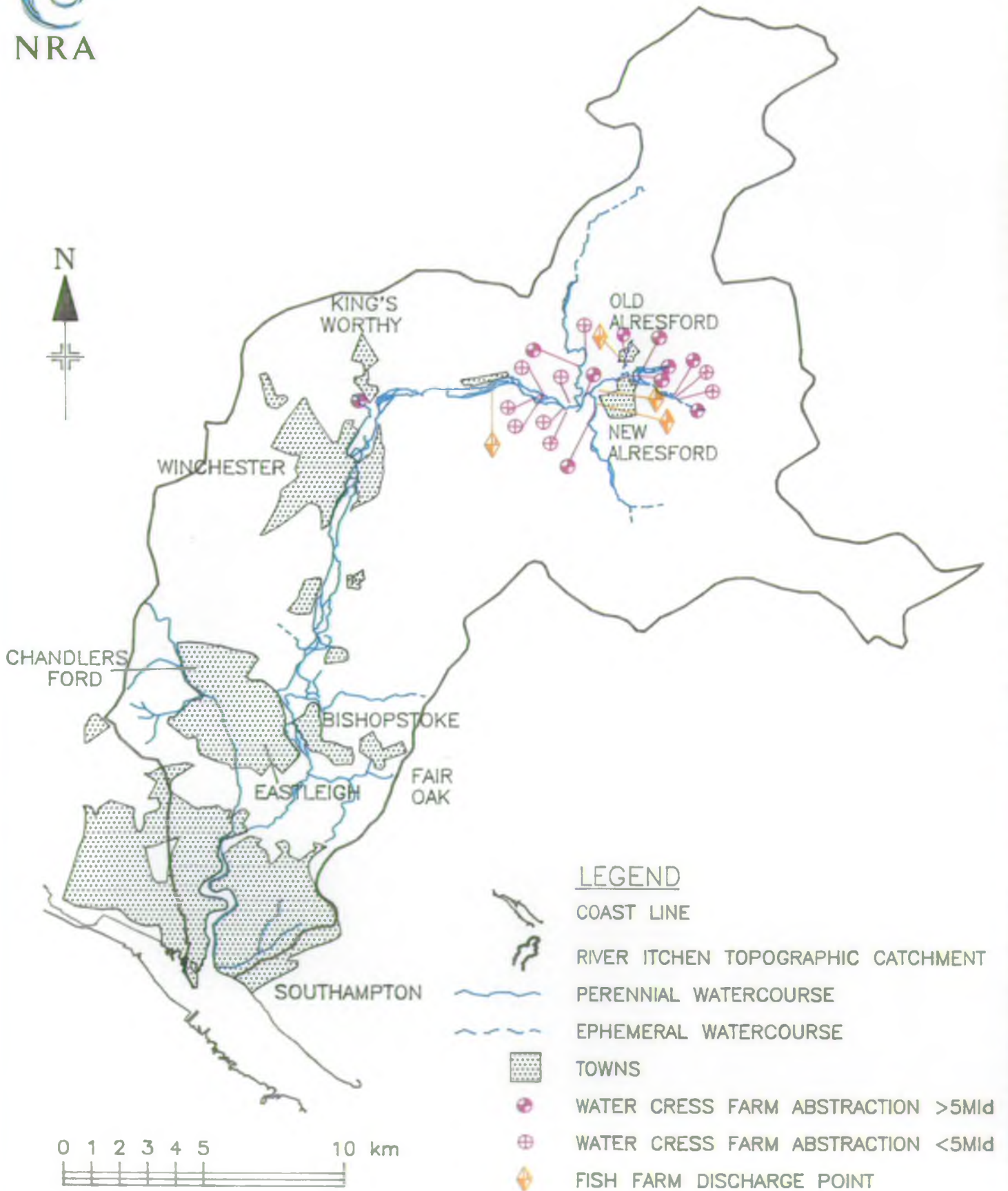
Water Resources

- Availability of resources within the terms specified in the licence.
- New agricultural licences to specify winter abstraction and storage.
- Embargo on new licences for consumptive use of chalk groundwater.

Water Quality

- There are no mandatory water quality guidelines for agricultural irrigation purposes.
- The Food and Agricultural Organisation of the United Nations (FAO) classifies water with salinity and chloride concentrations between 0.7 - 3.0 ds/m and 140-350mg/l respectively as having slight to moderate restrictions for irrigational use. NRA working guidelines categorise the types of crops grown under irrigation as "very sensitive" to "least sensitive" in terms of chloride toxicity. The maximum chloride concentrations recommended in the irrigation water range from 100mg/l (C1) up to 500mg/l (C1) depending on the tolerance of the crop.





AQUATIC AGRICULTURE

B3. AQUATIC AGRICULTURE



B3.1 General

This use refers to the operation of ponds and artificial beds adjacent to the river for the commercial rearing of fish and farming of watercress.

The majority of fish farms divert a licensed quantity of river flow through concrete or earth fish ponds. Concerns arise from fish farming due to the possible pollution from chemicals and organic matter. In addition, escapes of fish can disrupt fisheries in the river. Most fish farms are consented to discharge by the NRA and their effluent is monitored.

All cress grown in compliance with the industry's Code of Practice requires the use of groundwater to feed the cress beds in order to eliminate the risk of liver fluke and similar pests. The water is derived from artesian springs or boreholes and is passed continuously over the growing cress before being discharged directly to the stream or river.

A particular feature of both uses is that it is essentially non consumptive, in that all water either diverted or abstracted is returned to the river close to the point of abstraction. However there can be a notable reduction in river flows between the points of abstraction and discharge.

The discharges from fish farms are also covered in Section B6 : EFFLUENT DISPOSAL and abstraction from cress farms in Section B2 : WATER SUPPLY FOR INDUSTRY AND AGRICULTURE.

B3.2 Local Perspective

Cress farming represents a major industry in Hampshire, accounting for over 80% of the total watercress grown in the UK. There are over 120 cress farms in the county, with the size of the individual operations varying from small single beds to extensive farms.

The Itchen catchment contains ten large, and a number of smaller, watercress farms.

There are four licensed fish farms within the catchment, the largest producing several hundred tons of fish per year.

The majority of the cress and fish farms are concentrated in the upper part of the catchment in the Alresford area.

B3. AQUATIC AGRICULTURE



B3.3 Environmental Requirements

Water Quality

- To maintain water quality by enforcing consent conditions such that other uses are not compromised.

River Flow

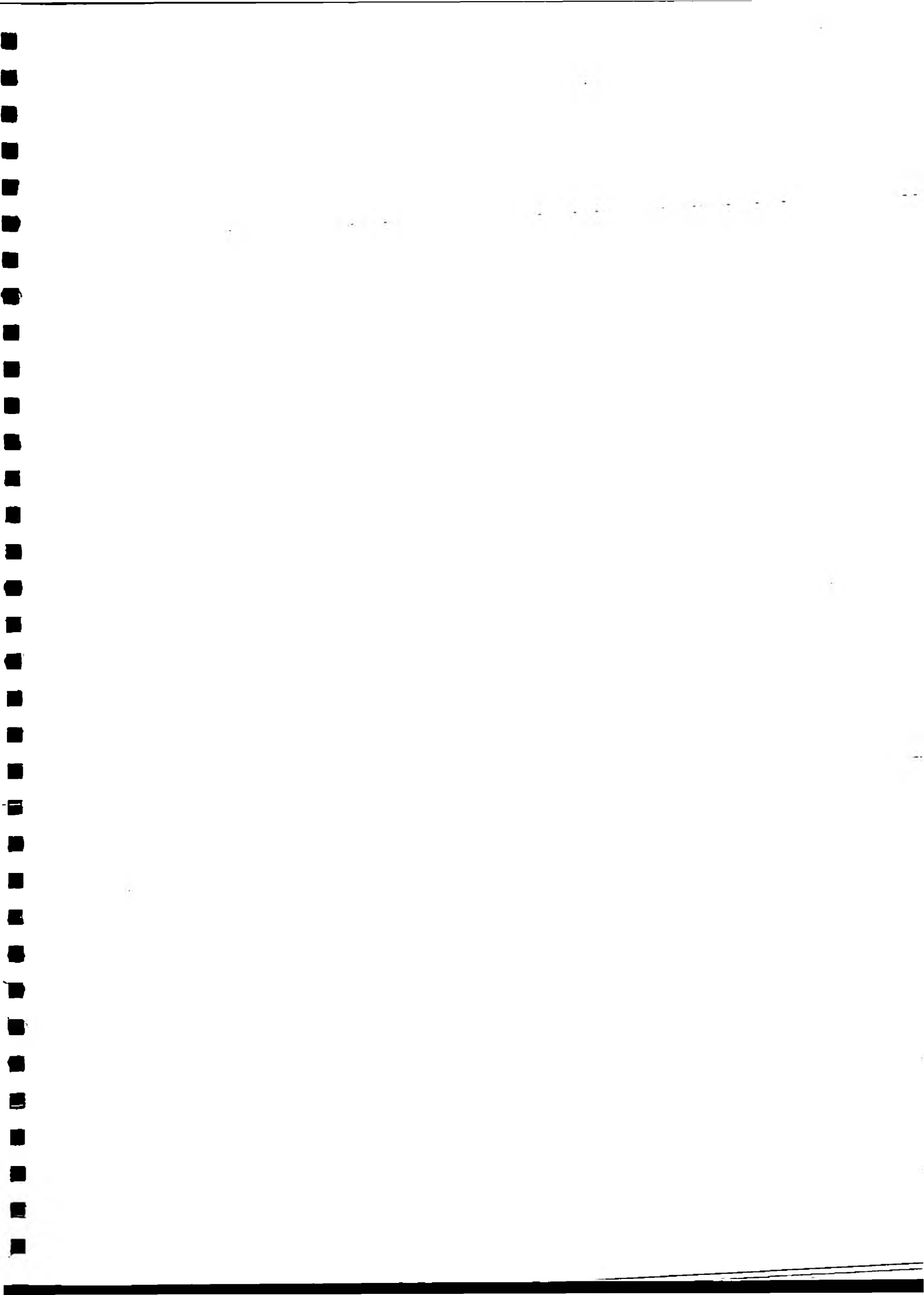
- To maintain river flows such that other uses are not compromised.

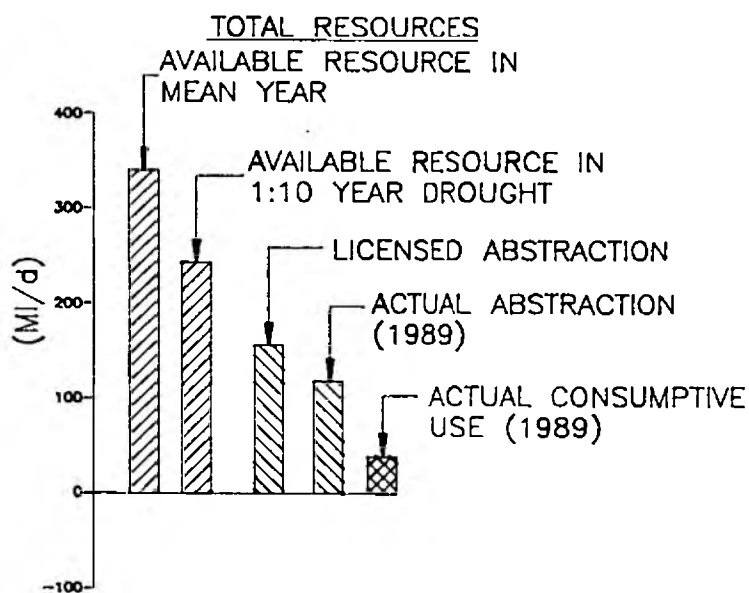
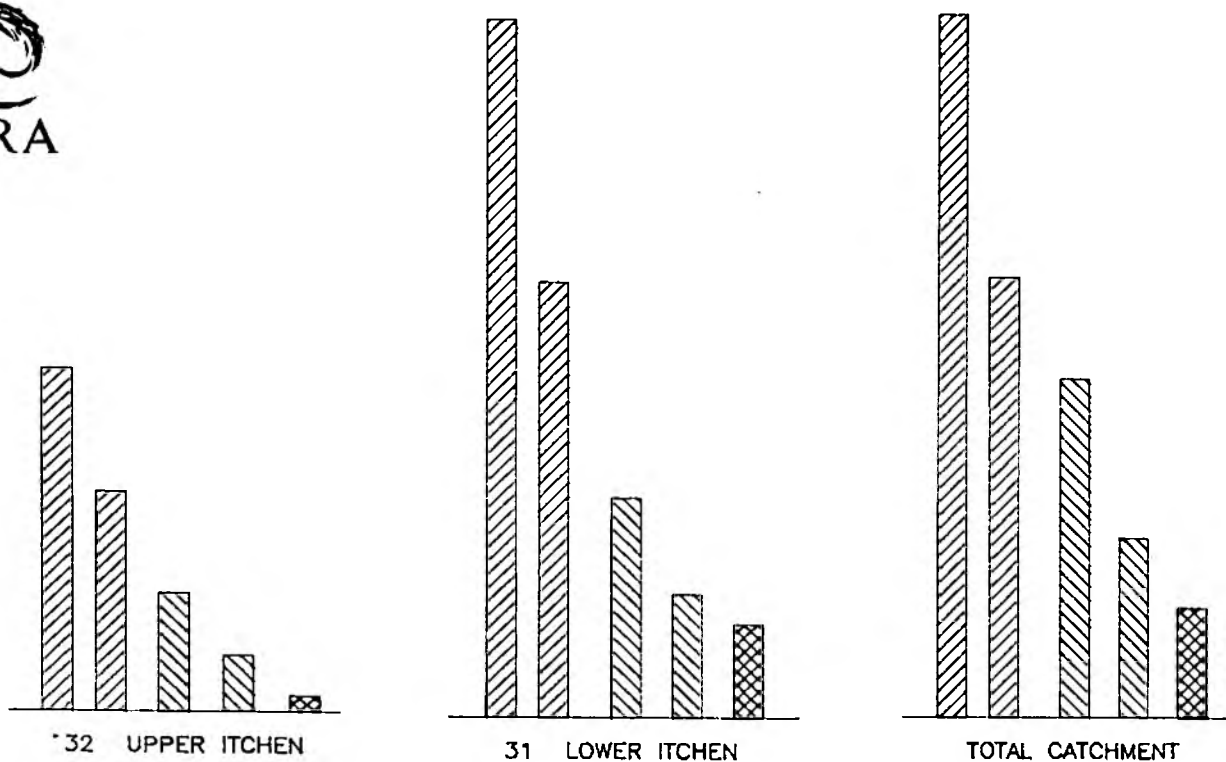
River Topography

- To ensure fish farms are located at sites such that other uses are not compromised.

River Management

- Ensure fish farms prevent mass escapes of fish which can disrupt the ecology of the river.





Resource Area	'Licensed' Abstraction (% of Resource)		Actual Abstraction (1989) (% of Resource)		Actual Consumptive Use (1989) (% of Resource)	
	Mean Year	1:10 Year Drought	Mean Year	1:10 Year Drought	Mean Year	1:10 Year Drought
32 UPPER ITCHEN	35	54	16	25	5	8
31 LOWER ITCHEN	32	51	18	29	14	22
Overall Catchment Balance	48	77	25	41	15	25

RESOURCE USAGE

B4. RESOURCE USAGE



B4.1 General

This section compares the overall usage for water supply within the catchment with the available resource. Resource usage has been assessed for each resource area and for the overall catchment.

The available resource is defined as the annual effective rainfall to the resource area and is available as either surface run-off or groundwater recharge. Both mean and 1:10 year drought annual available resource totals have been assessed. These totals are compared with the total annual licensed abstraction and the estimated actual abstraction for a typical year (1989).

In some cases abstracted water is returned directly to the river with minimal losses, as in the case of cress farms. Part of the public water supply abstraction is for customers within the catchment, a significant proportion of which is then returned to the river via effluent discharges. This return of effluent can play an important part in the maintenance of river flows. The difference between the water abstracted from the catchment and that returned is termed the 'consumptive use'. The mean consumptive use has been assessed using actual abstraction and discharge data, where available, for a typical year (1989).

The purpose of these data, which are shown in the figure, is to illustrate the scale of water resources development within the total catchment and each resource area.

B4.2 Local Perspective

Assessment of the resource usage for the total catchment indicates that approximately half of the available resource in a mean year is allocated for licensed abstraction. Actual abstraction in 1989 was approximately half of the licensed total and one third of that abstracted was returned to the catchment as effluent. Actual consumptive use is approximately 15% of the mean available resource, and 25% of that in a 1 in 10 year drought.

Although licensed abstraction in the Upper Itchen is approximately a third of the mean available resource, almost 90 per cent of the abstraction total is for watercress farms and is a non-consumptive use of resources. Consequently, consumptive use is only 5 per cent of the mean resource.

The Candover augmentation scheme, operated by the NRA, consists of three pairs of boreholes in the dry valleys near Preston Candover (See map with Section B1). The purpose of the augmentation scheme is to pump chalk groundwater from storage in the upper part of the catchment to maintain water quality in the lower reaches and transfer the supplies downstream via the river to support the public water supply abstraction at Gaters Mill. This has benefits to the river in the intervening reaches. The scheme was installed in time to be operated during the 1976 drought. During 6 months testing over this period, the nett yield of the scheme was approximately 27Ml/d which represents an improvement in the summer low flow (Q95) at Highbridge and Allbrook gauge of over 5 per cent.

A further augmentation scheme was installed by Southern Water Authority in 1981 in the Alre catchment but this has yet to be commissioned by the NRA. The nett yield of the scheme is likely to be approximately the same as that of the Candover scheme.

B4. RESOURCE USAGE



The consumptive use in the lower Itchen is approximately a quarter of the drought resource. Surface and groundwater abstractions are concentrated along the 3 kilometre reach between Otterbourne and Twyford, where total licensed abstraction amounts to over half the summer low flow as measured at the downstream gauge. There is therefore a significant reduction in flows downstream of Otterbourne during low flow periods.

The annual water resources of the catchment are considered to be fully committed upstream of Gaters Mill, although there may be potential for further seasonal abstractions. Additional resources of 70 to 90 Ml/d may be available at the tidal limit of the catchment for use in demand areas to the north and east. The increases in water demand in the catchment to 2010, estimated at 20 per cent, could be met by a combination of demand management, increased abstraction and transfer northwards from the tidal limit.

B4.3 Overall Supply Objectives

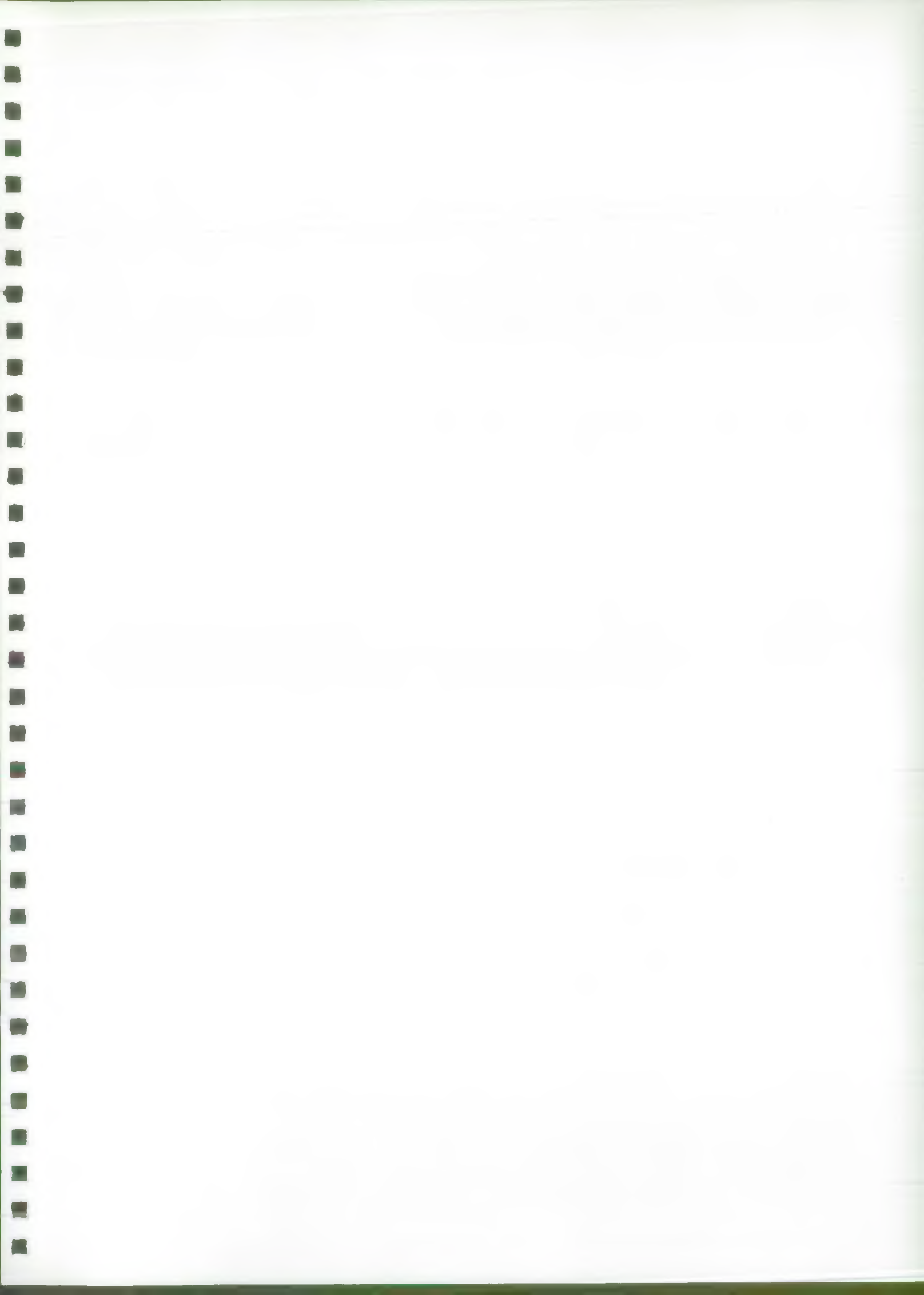
- To ensure that any future resource developments do not derogate the flow regime within the catchment.
- To secure, where possible, measures for the benefit of the catchment within new licence agreements.
- To meet increased demand in the catchment by northward transfer of resources from close to the downstream freshwater limit with appropriate storage facilities, whilst ensuring sufficient flows downstream for salmonid migration and maintaining water quality in the estuary.
- To determine the maximum yield of an abstraction at the tidal limit consistent with the achievement of environmental objectives.
- To reduce the level of abstraction in the Otterbourne/Twyford area, replacing this resource with increased surface water abstraction at the tidal limit.
- To commission the Alre augmentation scheme to protect water quality and support abstraction from the lower reaches of the river.
- To conform with the existing minimum residual flow settings in the catchment.
- To incorporate controlling flows in new abstraction licences as required.

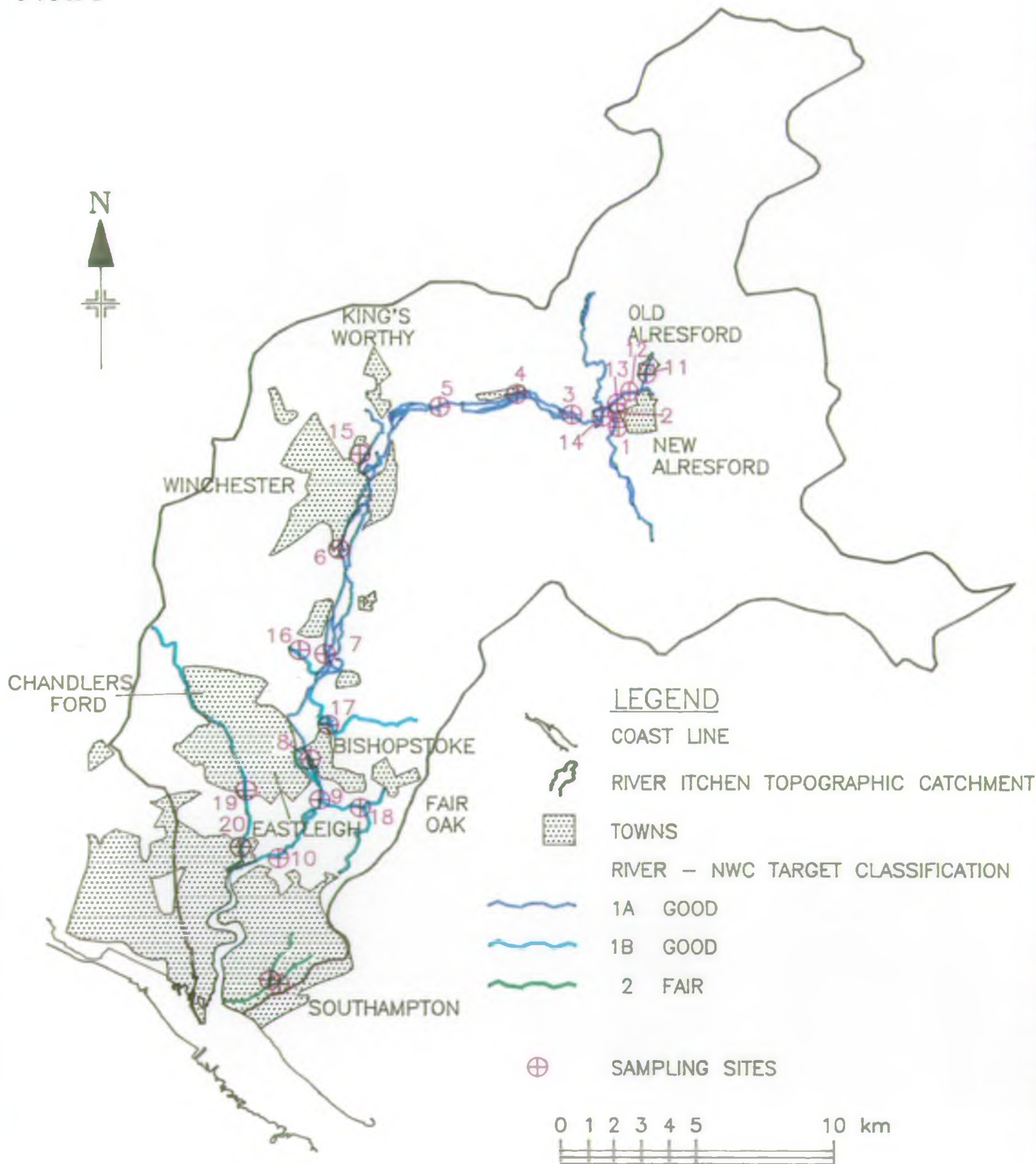
B4. RESOURCE USAGE



B4.3 Overall Supply Objectives /continued

- To ensure that any new groundwater licences are of no detriment to surface flows or the natural ecology in the catchment.
- To encourage the operation of seasonal resource management schemes to improve surface flows during the summer.
- To encourage water companies and consumers to adopt water saving measures.
- To encourage water companies to meet leakage targets and to adopt measures to manage demand.
- To maintain and develop the hydrometric monitoring network.
- To operate a policy of returning suitably treated effluent to the catchment.
- To consider the effects of possible climate change in long term water resource planning.





NWC TARGET CLASSIFICATION

B5. STATUTORY WATER QUALITY OBJECTIVES



B5.1 General

Whereas continental European practice is to apply uniform emission standards to all effluents, river water quality in the United Kingdom is managed by matching effluent consent conditions to the needs of the environment and the circumstances of individual discharges. Environmental Quality Objectives (EQOs) are determined for receiving waters and quantified as Environmental Quality Standards (EQSs); permitted pollution load and consent conditions can then be calculated for each discharge.

EQSs and consent standards for toxic or non-degradable substances are very strict and in practice there is little difference between the two control philosophies, but in the case of degradable wastes the British approach results in protection of the environment whilst allowing rational decisions to be taken about the allocation of investment to treatment plant.

By defining the water quality requirements of different water uses (e.g. agriculture, water supply, angling etc.) it is possible to set use-based EQOs and to classify individual river reaches according to the functions they serve. However, this approach lacks the means for making absolute comparisons of water quality - from year to year or between different water courses. The National Water Council (NWC) classification introduced in 1979 enabled such comparisons to be made, but used only a limited number of water quality classes defined in terms of Biochemical Oxygen Demand (BOD), Dissolved Oxygen and Ammonia. This system was used in the National River Quality Surveys of 1980 and 1985, and following the 1990 Survey was refined by the introduction of a biological component which enables the distortions inherent in the sampling programme to be corrected by reference to the biology of the rivers concerned.

The NRA is developing a more comprehensive use-related water quality classification system, but the NWC scheme will continue to be used until this is available. The new scheme will classify river water quality according to the following criteria:-

- 1) Compliance with the EQSs relating to identified use-related EQOs.
- 2) Compliance with the relevant NRA target class.
- 3) Compliance with relevant EC Directives.

Each of the use-related EQOs proposed will have an associated set of EQSs.

The uses have been largely identified throughout this Plan. However, the process of preparing River Catchment Management Plans is progressing at the same time as the NRAs Water Quality Working Group. Therefore many of the EQSs relevant to each use have not yet been determined and the water quality requirements quoted in the plans are either the new standards where known or existing national or EC Directives. They will be revised when the new water quality classification system comes into operation.

B5. STATUTORY WATER QUALITY OBJECTIVES

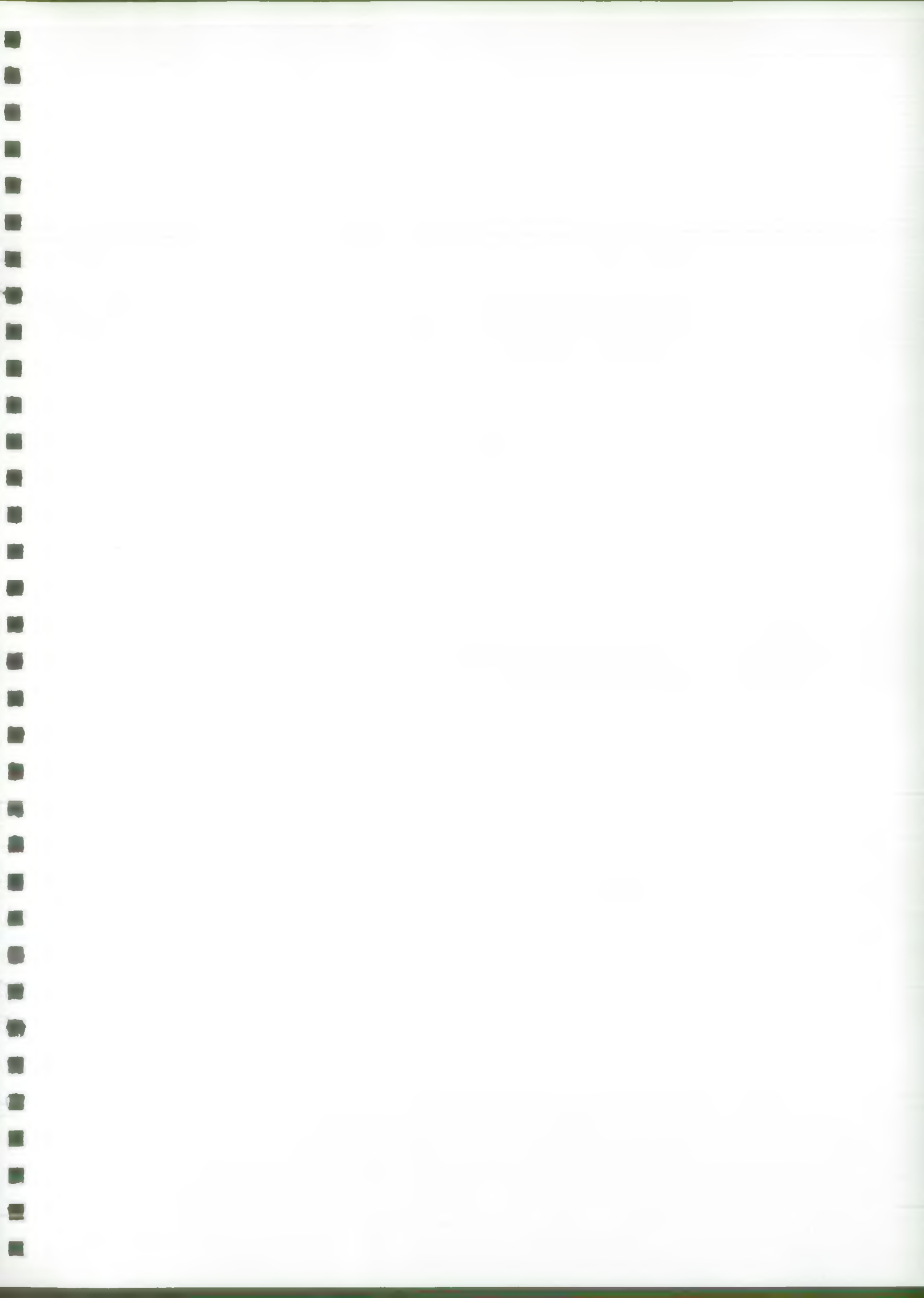


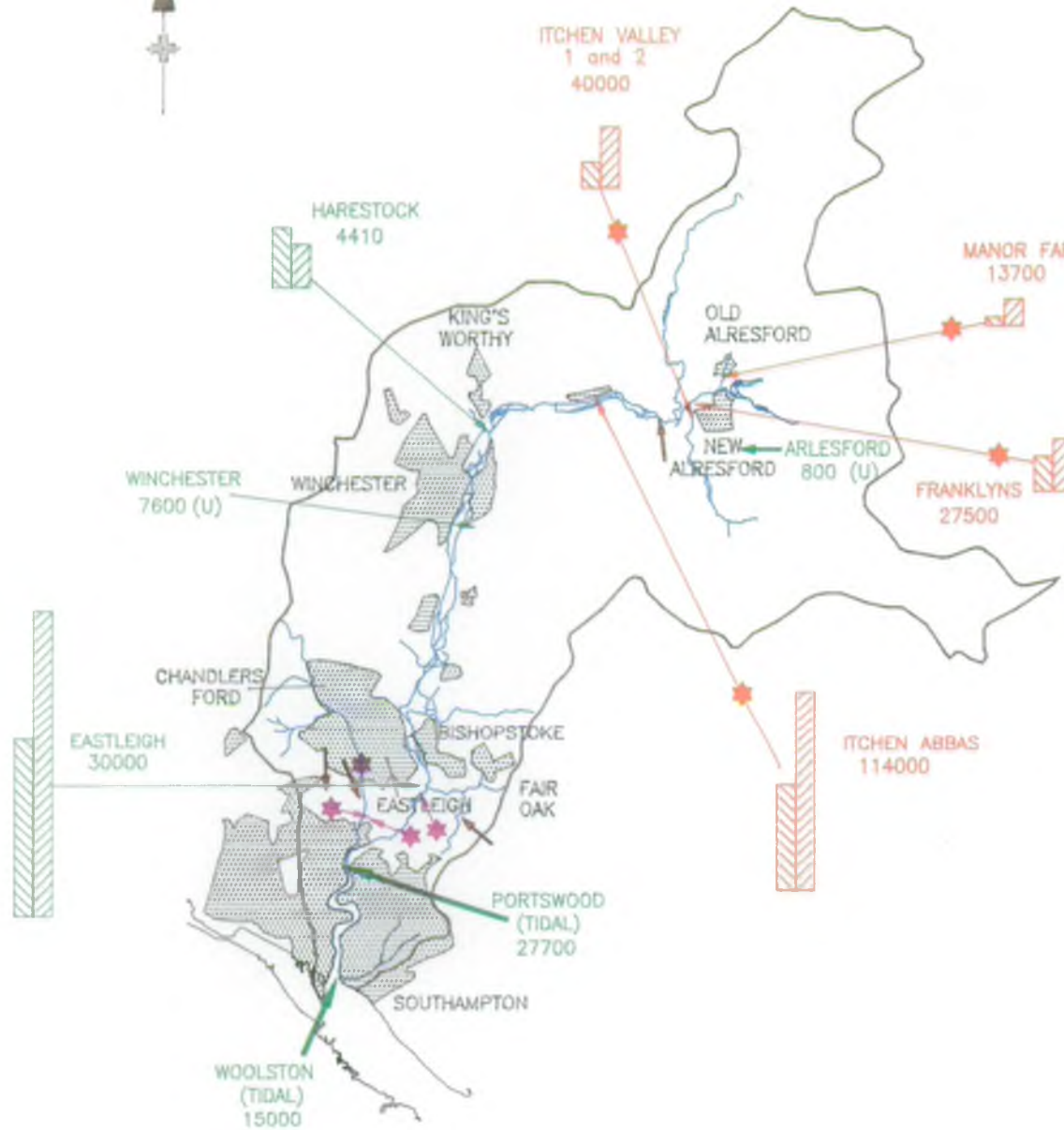
B5.2 Local Perspective

The map shows the existing NWC target designations within the Itchen catchment. Compliance is assessed using the results of a comprehensive surface water sampling programme. The location of the routine sampling sites are shown on the map and detailed in Table B5.1





Table B5.1 - Routine Surface Water Sampling Points





Map Ref. No.	River/Stream	Sampling Point	Grid Ref.
1	Itchen	D/S Alresford By-Pass	SU5747 3172
2	Itchen	Sewards Bridge	SU5743 3222
3	Itchen	Itchen Stoke	SU5582 3218
4	Itchen	U/S Itchen Abbas FF	SU5387 3294
5	Itchen	Easton	SU5113 3247
6	Itchen	St. Cross Bridge	SU4754 2718
7	Itchen	Otterbourne	SU4703 2326
8	Itchen	Bishopstoke	SU4650 1933
9	Itchen	D/S Eastleigh STW	SU4682 1783
10	Itchen	Gaters Mill	SU4539 1565
11	Alre Tributary	U/S Manor Farm FF	SU5860 3371
12	Alre	U/S Franklyns FF	SU5801 3300
13	Alre	Drove Lane	SU5743 3259
14	Candover Brook	Borough Bridge	SU5687 3233
15	Nun's Walk Stream	Nun's Walk Stream	SU4828 3070
16	Poles Lane Stream	Otterbourne	SU4617 2339
17	Bow Lake	Bow Lake	SU4715 2059
18	Allington Lane Stream	Allington Lane Stream	SU4821 1755
19	Monks Brook	Chestnut Avenue	SU4427 1817
20	Monks Brook	Swaythling	SU4405 1605
21	Sholing Common Stream	Sholing Common Stream	SU4506 1111
22	Weston Common Stream	Weston Common Stream	SU4538 1095



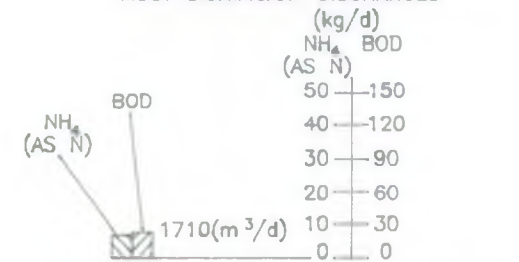


LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  RIVER ITCHEN
-  TOWNS

SYMBOL	TYPE OF DISCHARGE	RANGE (m ³ /d)
	PUBLIC SEWAGE TREATMENT WORKS	>10
	PRIVATE SEWAGE TREATMENT WORKS	>10
	COOLING WATER	125-450
	FISH FARM EFFLUENT	13200-114000

DAILY POLLUTANT LOADING FROM THE MOST SIGNIFICANT DISCHARGES



EFFLUENT DISPOSAL

B6. EFFLUENT DISPOSAL



B6.1 General

This use relates to the disposal of domestic, industrial and agricultural effluents to the river system. The conditions to be met by a particular discharge are set out in a specific discharge consent. They are calculated in relation to the quality objective assigned to the receiving water. It follows that if there is any subsequent deterioration in upstream water quality, or diminution of river flow beyond the values used in calculating the consent, then downstream uses could be put at risk.

The discharge of effluent to the river system can play an important part in the maintenance of river flows. The location of a discharge is therefore important from quantity as well as quality aspects.

B6.2 Local Perspective

There are only a limited number of public and private sewage treatment plants discharging throughout the catchment, ranging in size from 30 Ml/day at Eastleigh to less than 0.01 Ml/day at many of the smaller private treatment plants. A list of the major discharges is shown on Table B6.1 and their relative pollutant loadings are shown on the map with reference to Biochemical Oxygen Demand and Total Ammonia loads. The capacity of the river to accept these loads depends on supporting low natural flows by the operation of groundwater augmentation schemes.

Winchester sewage treatment works discharges to the ground through a series of ditches, where the effluent is afforded further 'natural' treatment during percolation through the unsaturated chalk. This has proved to be a very effective method of treatment and the effluent cannot be detected in the River Itchen itself. Alresford works also discharges its effluent directly to the ground.

There are no major discharges of process effluent anywhere in the catchment, although several cooling water discharges are licensed.

There are four fish farms discharging to the catchment, which are also discussed in Section B3 : AQUATIC AGRICULTURE. The consented pollutant loading to the river from the largest fish farm is over half of that from Eastleigh sewage treatment works.

B6. EFFLUENT DISPOSAL



B6.3 Environmental Requirements

Water Quality

- No deterioration in upstream water quality beyond that used in setting the consent.
- Continued monitoring of surface waters and effluent discharges to ensure compliance with consents.

River Flow

- No diminution of the flow regime below that used in setting the consents. Consents are normally set using Annual Q95 river flows.

River Topography

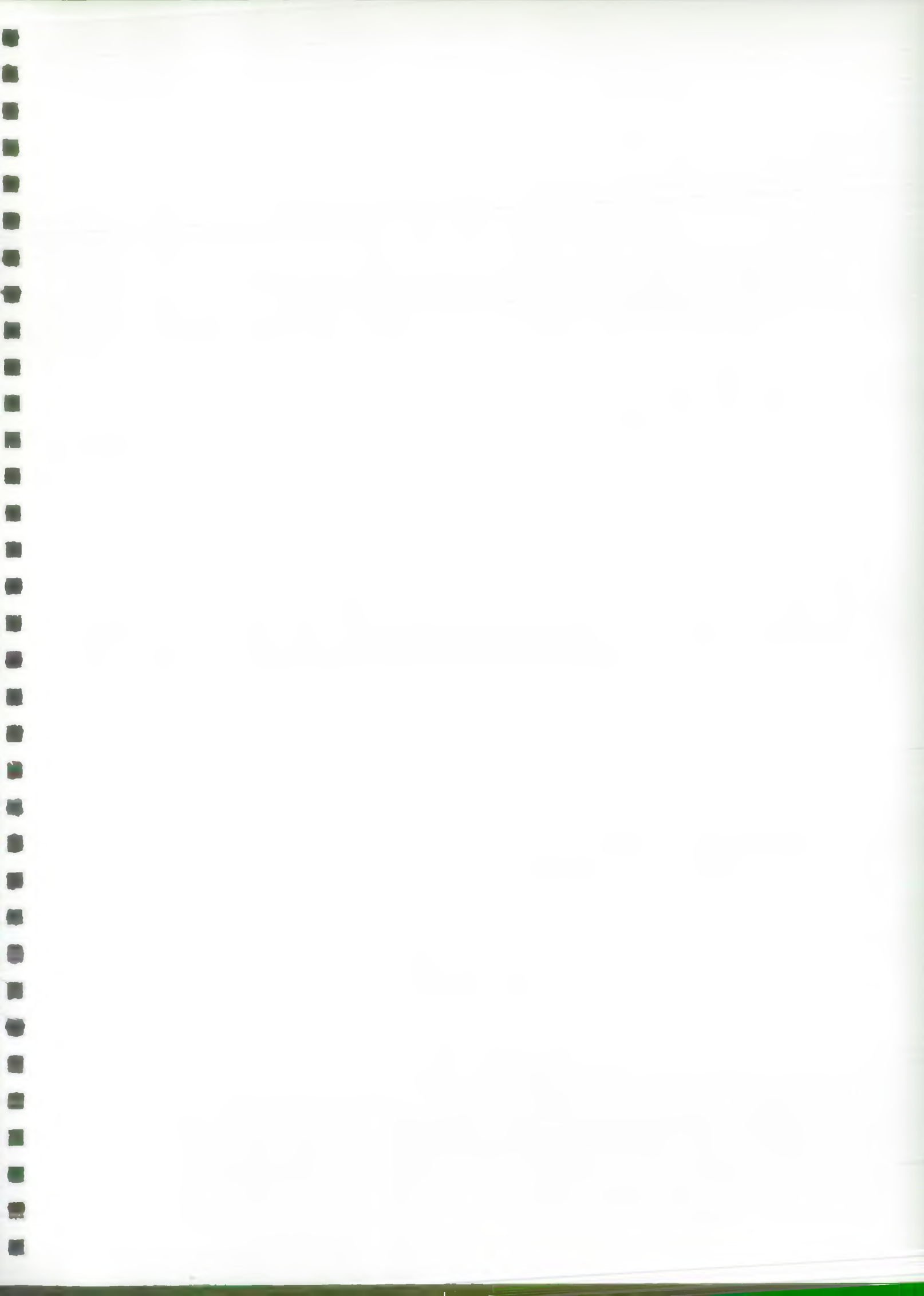
- Outfalls should be sited so as to achieve good effluent mixing with the river.

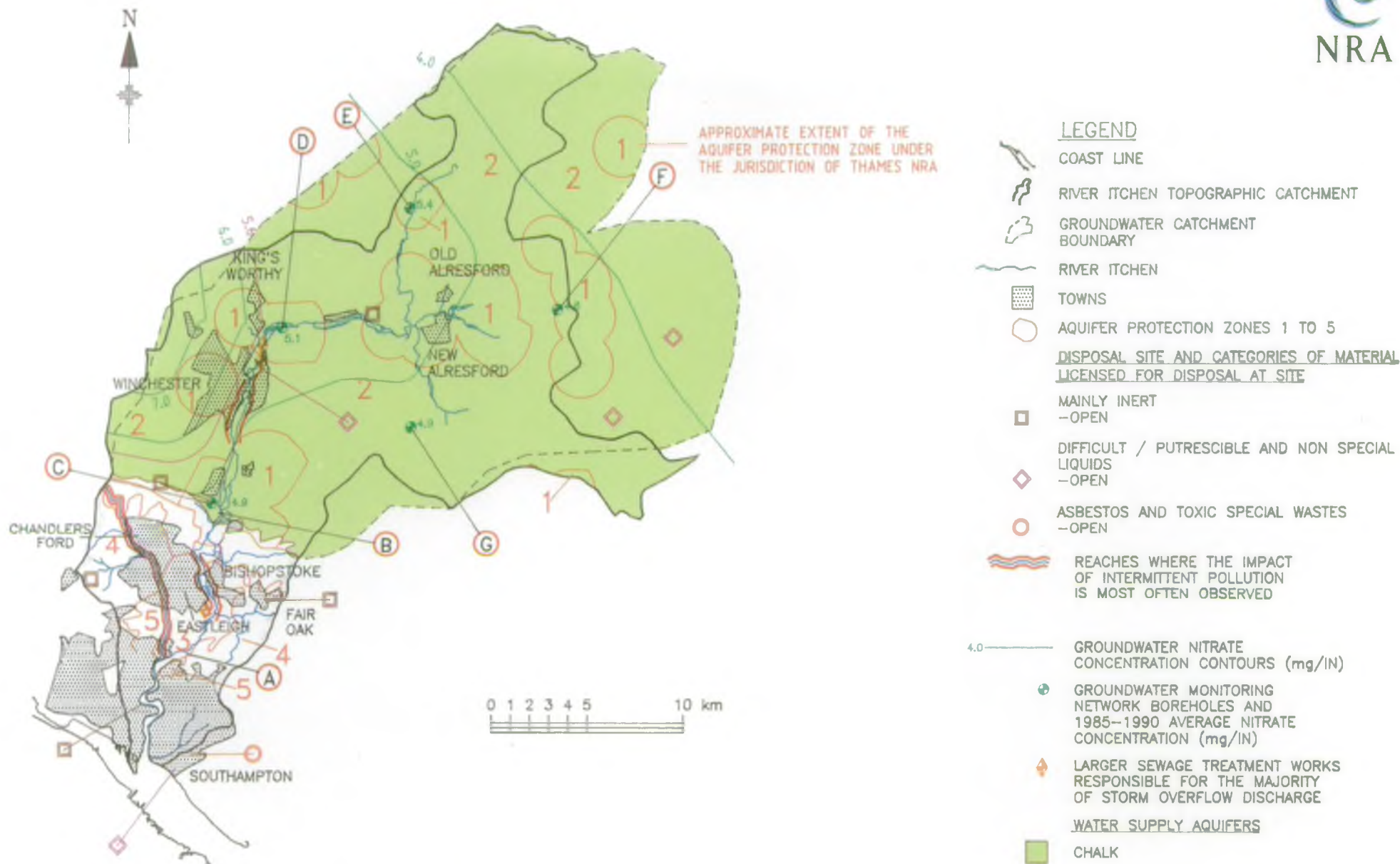
Table B6.1 List of Major Consented Discharges

Name	Type	Consented Flow (Ml/day)	Average Daily Loads (kg/day)	
			BOD	Ammonia
Eastleigh	Public STW	30.0	294	57
Portsmouth	Public STW (tidal waters)	27.7	188	463
Woolston	Public STW (tidal waters)	15.0	207	378
Winchester	Public STW	7.6	**	
Harestock	Public STW	4.4	43	18
Alresford	Public STW	0.8	**	
Itchen Abbas	Fish Farm	114.0	194	34
Itchen Valley 1&2	Fish Farm	40.0	56	8
Franklins	Fish Farm	27.5	49	11
Manor Farm	Fish Farm	13.7	25	3
ALL OTHER DISCHARGES	Private STW, Cooling, Industry, etc.	20.6	50	*

* Ammonia is not included in the discharge consent.

** These works discharge directly to underground strata.





INTERMITTENT AND DIFFUSE POLLUTION

B7. INTERMITTENT AND DIFFUSE POLLUTION



B7.1 General

All rivers can be affected by pollution from intermittent or diffuse sources, which vary in terms of both frequency and impact. They include consented surface water discharges and storm sewage overflows, industrial, agricultural or road traffic spillages, and discharges derived from more diffuse sources such as runoff from land.

This section highlights the potential risks to the catchment from such sources as chemical stores, given the potentially severe impacts which could occur as a result of accidents.

Pollution of surface or groundwaters can result from landfill sites. Comprehensive water quality monitoring is therefore essential to ensure that contamination does not result in harm to public health or damage to the environment. The landfill sites which give most obvious concern are those disposing of difficult and/or special wastes in areas overlying water supply aquifers. Many of these sites were constructed prior to the introduction of current licensing procedures.

Pollution of groundwater is a major cause for concern. The proposed NRA National Groundwater Protection Policy and the existing Aquifer Protection Policy (APP), as discussed in Section B4.3 are relevant in this respect. The map opposite shows the current APP Zones along with the location of open waste disposal sites. The Policy states that in Zone 1, which surrounds public water supply sources, the disposal of all but inert and non-toxic waste is prohibited. The remaining Aquifer Protection Zones represent progressively lower levels of prohibited waste disposal. Protection Zone 2, which covers the remaining Chalk and Upper Greensand aquifers not immediately adjacent to existing public water supplies, prohibits the deposition of incineration residues, medical, surgical and veterinary wastes, pulverised fuel ash and most forms of difficult or special wastes. Protection Zone 3, which extends over the more important remaining aquifers, has similar disposal restrictions to those imposed on Zone 2. Protection Zone 4 covering the remaining less important aquifers, and Zone 5 representing the impermeable clay substrate have no special requirement to protect the groundwater. The restrictions in Zone 5 are related to the protection of surface waters.

B7.2 Local Perspective

Intermittent pollution incidents in the Itchen catchment are predominantly centred around the urban areas of Winchester, Eastleigh and Southampton. The Monks Brook, a canalised stream passing through Eastleigh, suffers particularly from these sorts of pollution events, with oil spillage being a primary concern.

There are a number of consented stormwater overflows on the sewerage systems and at the treatment works. The map shows the larger treatment works responsible for the majority of the storm overflow volumes throughout the catchment.

The NRA operates a comprehensive surface water monitoring programme and a groundwater monitoring network. Groundwater and pesticide monitoring sites are shown on the map and the routine surface water sampling sites are shown in Section B5 : STATUTORY WATER QUALITY OBJECTIVES.

87. INTERMITTENT AND DIFFUSE POLLUTION



There are approximately 30 known landfill sites within the Itchen catchment, many of which have now been closed. The types of waste range from mainly inert materials, to potentially more difficult industrial waste and/or domestic refuse.

Although information is limited there are few reported problems associated with waste disposal sites in the Itchen Catchment. However, given the obvious concern with regard to high risk sites, increased monitoring, particularly of groundwater, may be required in the future.

The contours shown on the map represent the average nitrate concentrations in groundwater for the last 8 years as determined from the NRA groundwater monitoring network. EC Directive 71/354/EEC lays down guideline levels and Maximum Admissible Concentrations of 5.6 and 11.3mg/1N respectively for water to be used for human consumption. The data indicate that there is no exceedence of maximum admissible concentrations and levels are below the guideline limits throughout most of the catchment.

The average total pesticide concentrations for 1985-1990 from representative sites for both surface and groundwater are given on Table B7.1. Triazines and Drins represent the two major groups of compounds which give rise to the most concern throughout the Southern Region of the NRA. Surface and groundwater pesticide concentrations for the two indicator groups show generally low levels, significantly below the Maximum Admissible Concentrations of 500 ng/l for each group of compounds.

Given the large number of major roads in the catchment, stormwater runoff is a significant issue. Over the past decade or so, all new road designs have been assessed in relation to their impact on the respective groundwater protection zones. A number of practical measures have been developed to ensure minimal impact on Zone 1 areas in particular, including positive drainage, and oil interceptors. These practices are currently under review and are to be included in formal guidelines to be issued by the NRA in the near future.

The chalk aquifer is particularly vulnerable to intermittent and diffuse pollution as it is at the surface over much of the catchment and, once contamination has occurred, it is very difficult to restore groundwater quality.

Table B7.1 - Representative Pesticide Concentrations

Site	Ground/ Surface Water	Total Triazines (ng/l)	Total Drins (ng/l)	Maximum Admissable Limits (ng/l)
A	Surface	82.0	18.0	500
B	Surface	24.7	2.1	500
C	Ground	53.3	2.6	500
D	Ground	53.0	2.6	500
E	Ground	53.0	2.6	500
F	Ground	66.6	1.3	500
G	Ground	66.6	1.3	500

B7. INTERMITTENT AND DIFFUSE POLLUTION



B7.3 Environmental Requirements

Water Quality

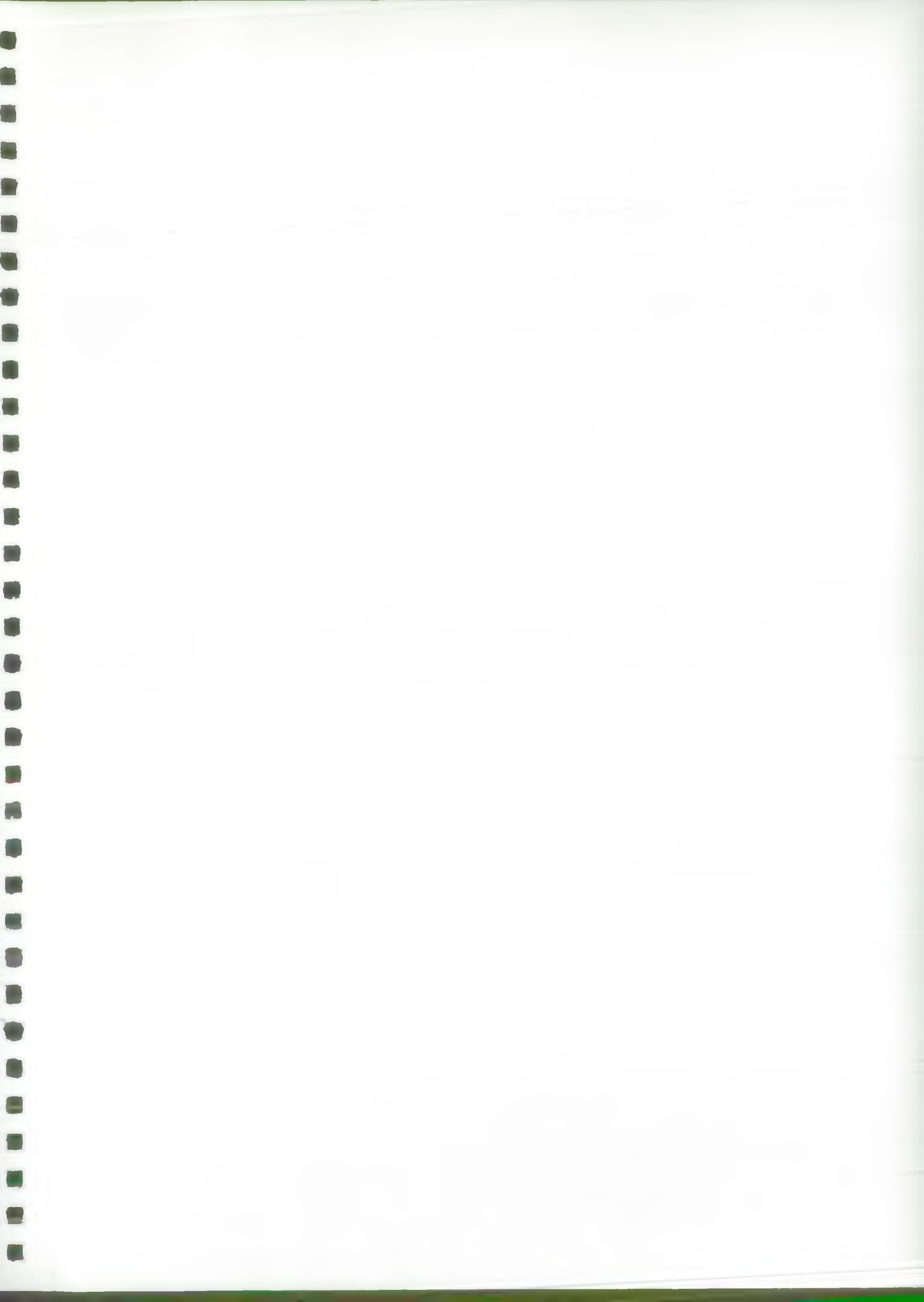
- To have emergency procedures to deal with, or mitigate, the impact of accidental discharges.
- Continued monitoring of surface and groundwaters.
- To encourage the early reporting of all pollution incidents to the NRA.
- Compliance with EC Directives on the discharge of dangerous substances.
- Implementation of the NRA National Groundwater Protection Policy.
- Appropriate monitoring of effects of disposal sites on surface and groundwater quality.
- Ensuring that licensing of disposal sites is in accordance with either the present Southern Region Aquifer Protection Policy or the future NRA National Groundwater Protection Policy.

River Flow






- Basic flow regime to reduce the impact of intermittent and diffuse pollution is met by the requirements detailed in Section B9 : CONSERVATION.

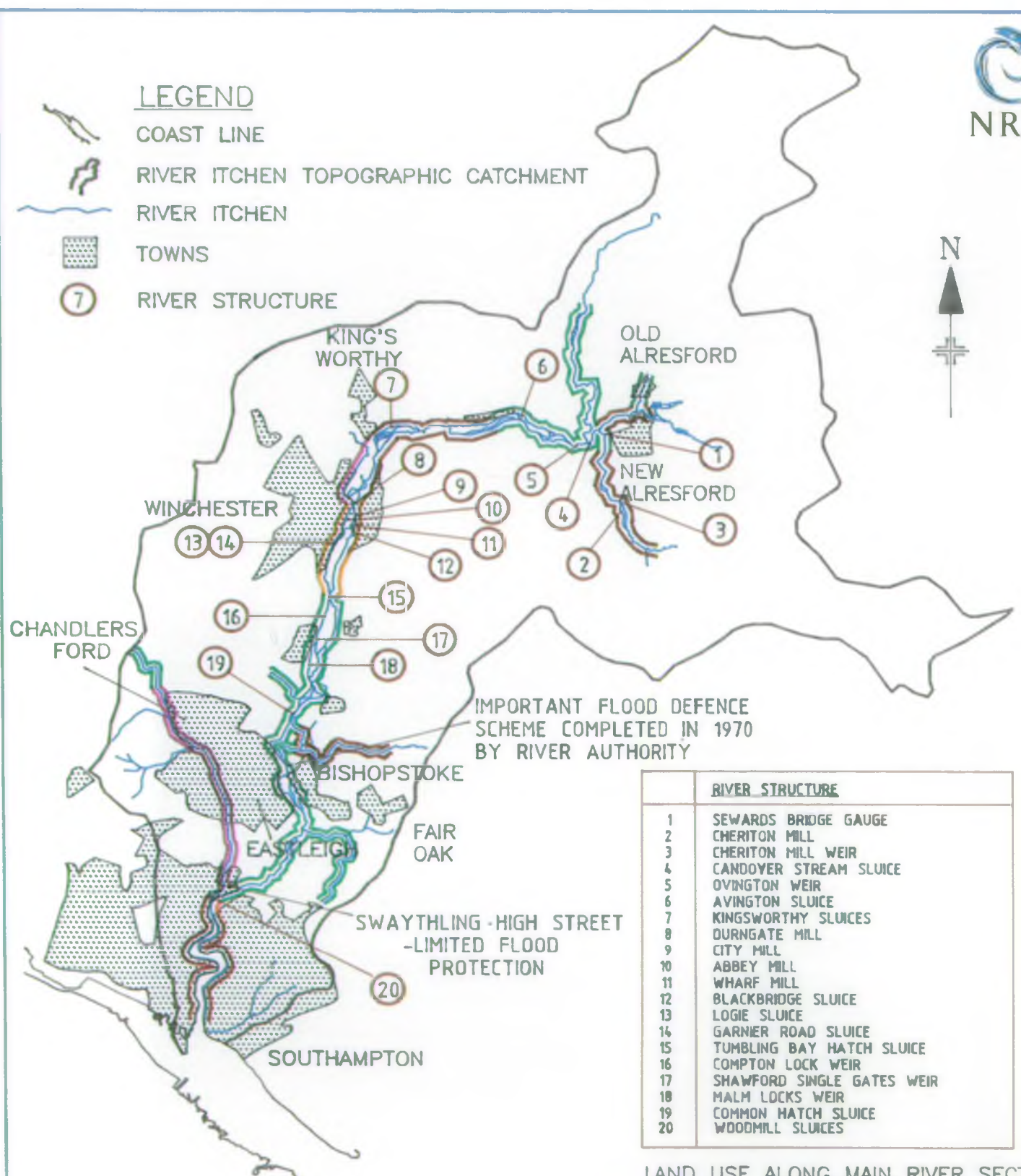
River Topography

- Provision of terrestrial bankside vegetation to act as a buffer for diffuse pollution from overland run-off, particularly in areas of intensive agriculture.








LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  RIVER ITCHEN
-  TOWNS
-  RIVER STRUCTURE



RIVER STRUCTURE	
1	SEWARDS BRIDGE GAUGE
2	CHERITON MILL
3	CHERITON MILL WEIR
4	CANDOVER STREAM SLUICE
5	OVINGTON WEIR
6	AVINGTON SLUICE
7	KINGSWORTHY SLUICES
8	DURNGATE MILL
9	CITY MILL
10	ABBAY MILL
11	WHARF MILL
12	BLACKBRIDGE SLUICE
13	LOGIE SLUICE
14	GARNIER ROAD SLUICE
15	TUMBLING BAY HATCH SLUICE
16	COMPTON LOCK WEIR
17	SHAWFORD SINGLE GATES WEIR
18	MALM LOCKS WEIR
19	COMMON HATCH SLUICE
20	WOODMILL SLUICES

LAND USE ALONG MAIN RIVER SECTIONS - FLOOD PROTECTION CATEGORY

-  A
-  B
-  C
-  D
-  E



FLOOD DEFENCE AND LAND DRAINAGE

B8. FLOOD DEFENCE AND LAND DRAINAGE



B8.1 General

Flood defence relates to the provision of effective defence for people and property against flooding from rivers and the sea. This use also relates to providing land drainage for agricultural areas within river valleys for which the level of the water table is of vital importance. Normally flooding is a result of extreme climatic conditions, such as high winds or very heavy rainfall. Flood events are described in terms of the frequency at which, on average, a certain severity of flood is exceeded. This frequency is usually expressed as a return period, such as 1 in 50 years.

The effectiveness of flood defences can be measured in terms of the return period up to which they prevent flooding. It is clear that different types of land use, for example, urban areas and pasture land, require different levels of effectiveness for the defences. The different land uses and the proposed targets for their protection are shown on Table B8.1.

For the purposes of management, certain reaches of the river are formally designated as Statutory Main River. On Main River, the NRA have special powers under the Water Resources Act (1991) to carry out works or control the actions of others. Any proposal that could interfere with the bed or banks or obstruct the flow in the river requires formal consent from the NRA. Under the Land Drainage Act the NRA also have a general duty to oversee, and have powers to control, significantly obstructive works on any watercourse. The criteria for designation of Main River are currently under review.

The drainage of low-lying land may be the legal responsibility of Internal Drainage Boards. IDB's are responsible for the drainage ditches within their area, up to the point where they discharge into Main River.

The nature of the works carried out for flood defence means that this use can come into conflict with other river uses - notably fisheries and conservation. Consultations are carried out and, where feasible, methods are devised whereby the river can achieve its flood protection target without significant habitat degradation.

Residential and commercial development in a river catchment is a cause for concern. Urbanisation of an area increases the amount and rate of run-off into the river which can increase the risk of flooding. Development in the flood plain is an even greater problem as it places additional properties at some risk of flooding and reduces the natural flow attenuation effects of the flood plain. This can lead to higher levels upstream and higher flows downstream of the development, and therefore an increased risk of flooding. The effects of development in a catchment therefore have to be considered very carefully, particularly if they are in the flood plain.

B8. FLOOD DEFENCE AND LAND DRAINAGE



B8.2 Local Perspective

Flood defence is not considered a particularly important issue in the Itchen catchment and there are no flood defence schemes on the River Itchen itself. It is very rare for properties to flood although low lying agricultural land floods regularly. 1947 and 1960 saw quite severe flooding along the Monks Brook which joins the Itchen at Woodmill from the west of the catchment. Flood defence schemes were constructed to alleviate this problem.

There are several sluices in Winchester itself which are operated by the City Council to alleviate flooding during storm events.

B8.3 Environmental Requirements

River Topography

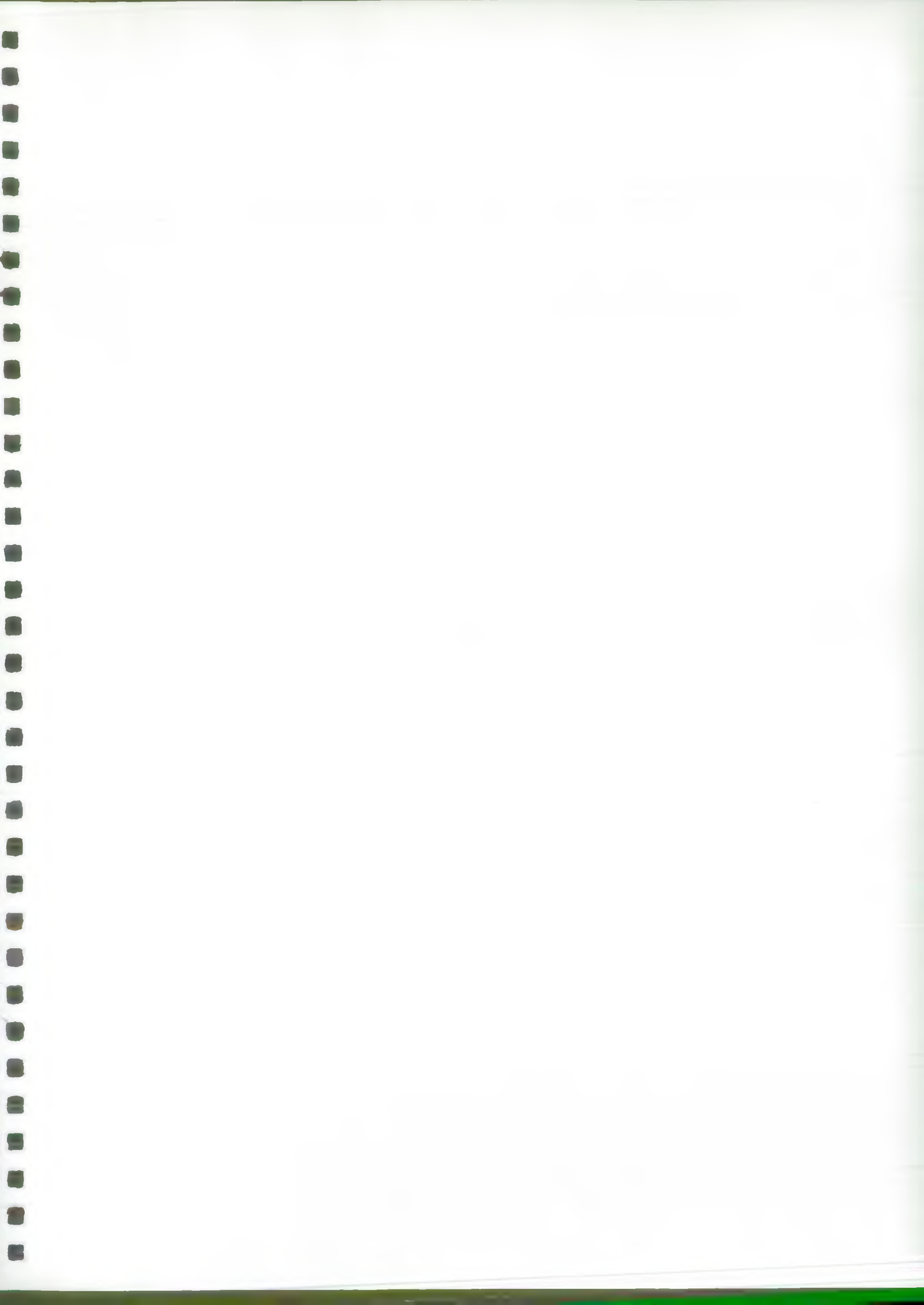
- Inspect and maintain flood defences to ensure their continued effectiveness.
- Ensure that there is no unnecessary increase in flood risk as a result of new development.
- Resist development in the flood plain unless all measures are taken to ensure no increase in flood risk.
- Maintenance of drainage structures such as weirs and stops.
- Maintenance of long term channel capacity by dredging/desilting if appropriate.

River Management

- Carry out weedcutting where necessary to protect people and property to the appropriate standard.
- Carry out necessary dredging (generally at mill heads) to remove deposited silt.
- Carry out tree management to prevent obstructions caused by fallen trees.
- Maintenance of channel water levels and hence water table levels appropriate to land use through:-
 - control and operation of drainage structure
 - weedcutting in drainage channels
- Ensure operation of relevant sluice gates.
- Carry out flood defence works with reference to environmental needs and requirements.

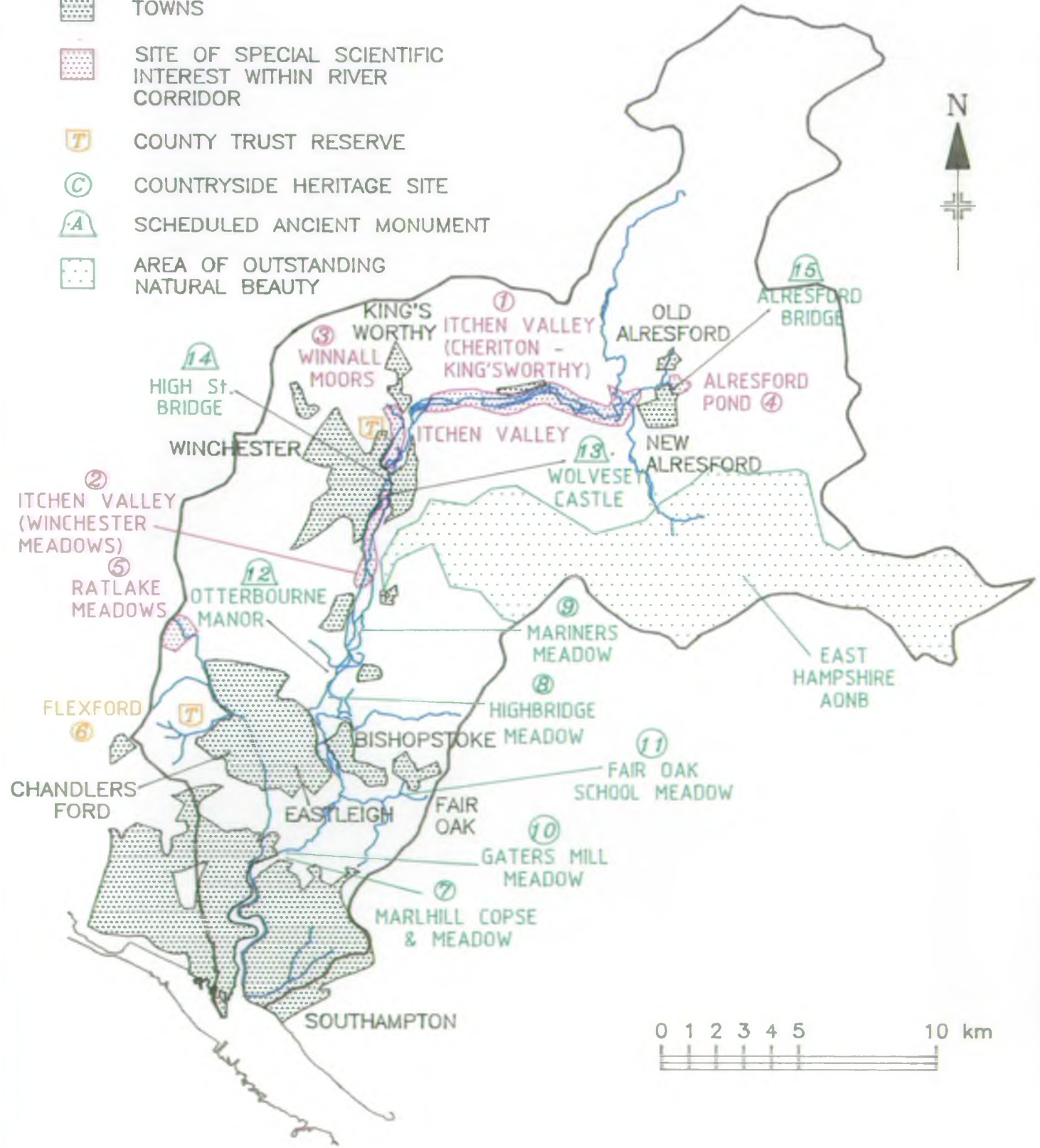
Table B8.1 Land Use Bands

Land Use Band	Description of Typical Land Use	Typical Standard of Protection Return Period
A	Dense Urban Areas	At least 1 in 50 years
B	Suburban/Urban Areas (Less dense than Band A)	1 in 20 to 1 in 50 years
C	Limited numbers of communities and/or very intensive agriculture	1 in 10 to 1 in 50 years
D	Isolated and limited numbers of properties and/or arable farming	1 in 2 to 1 in 5 years
E	Very few properties and/or extensive grassland	Annual flooding
F	Any area to which a lower standard of service is offered for environmental or economic reasons	



LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  RIVER ITCHEN
-  TOWNS
-  SITE OF SPECIAL SCIENTIFIC INTEREST WITHIN RIVER CORRIDOR
-  COUNTY TRUST RESERVE
-  COUNTRYSIDE HERITAGE SITE
-  SCHEDULED ANCIENT MONUMENT
-  AREA OF OUTSTANDING NATURAL BEAUTY



CONSERVATION

B9. CONSERVATION



B9.1 General

This use relates to the protection of the aquatic flora and fauna and ecology of the river corridor. This includes organisms which are dependent upon the river itself, and plants and animals which are able to exploit the river banks. A healthy river and adjacent corridor environment are characterised by ecologically diverse and abundant plant and animal communities which enhance the overall quality of the landscape.

The character of the river and its corridor is highly dependent upon the adjacent land use and the type and frequency of river works undertaken. Rivers have been managed and used by man for thousands of years. The creation of water meadows and wet pasture, pollarded willows and mills, all added to the diversity and quality of the environment, both ecologically and visually. However, more recent measures like realignment, removal of bankside trees and draining of wetlands have significantly altered parts of this environment. Modern farming has often led to the removal of riverside vegetation and utilisation of the land up to the banks of the water course. This practice effectively removes beneficial shading and cover from the river and can often result in increased soil erosion and siltation from the surrounding land.

The NRA's conservation duties are set in Sections 16 and 17 of the Water Act 1991, which requires the NRA, whilst carrying out its own functions or dealing with proposals by others, to further the conservation of flora, fauna, geological and physiographical features of special interest, and the enhancement of natural beauty. Consideration of the impact of all proposals is also required to encompass the impacts on the man made environment including buildings, and sites and objects of architectural or historic interest.

Many other statutory and voluntary bodies have roles and responsibilities regarding conservation. English Nature is the official body primarily responsible for nature conservation and has the functions of establishing, maintaining and managing National Nature Reserves (NNRs); advising the Government; providing general information and advice; giving grants and supporting research. English Nature is also required to notify Sites of Special Scientific Interest (SSSIs) which are protected by the Wildlife and Countryside Act 1981. County Trusts for Nature Conservation and the Royal Society for the Protection of Birds play an important part in protecting wildlife, having established many reserves.

In addition to designated sites mentioned above, there are many other areas of high conservation value. In particular there are Local Nature Reserves (LNRs) and Sites of Nature Conservation Interest (SNCIs) which are monitored by the County Trusts for Nature Conservation (or Wildlife Trusts). The designated sites identified on the map opposite should not be regarded as the only areas of high conservation value in the catchment.

The Countryside Commission is responsible for conserving and enhancing the natural beauty and amenity of the countryside. It is empowered to designate, for confirmation by the Secretary of State for the Environment, National Parks and Areas of Outstanding Natural Beauty (AONBs). The Commission operate the Countryside Stewardship Scheme which offers grants to landowners for the preservation and re-creation of natural landscapes and wildlife habitats, including waterside areas.

B9. CONSERVATION



The Commission also advise the Government on the Environmentally Sensitive Areas programme which has similar aims and is managed by the Ministry of Agriculture, Fisheries and Food.

Lists of buildings of special architectural or historical interest are compiled by the Secretary of State for the Environment. English Heritage is responsible for protecting and conserving the architectural and archaeological heritage through managing Ancient Monuments and providing advice and information. Local planning authorities can also designate for special protection 'conservation areas' of particular interest.

The National Trust, an independent charity, owns and protects a variety of property and areas of land of natural beauty which are open to the public.

B9.2 Local Perspective

The conurbations of Southampton, Eastleigh and Winchester occupy almost half of the total length of the main river corridor. Fortunately a broad riverside corridor of open land is retained in many of these areas, which is rarely intensively farmed. Some of the habitats adjacent to the river have considerable intrinsic ecological importance as well as providing the elements of a natural landscape in an urban setting. The retention of these green corridors is vital.

Land use in the higher reaches of the catchment is generally mixed with a tendency for land within the valley to be under permanent grassland with arable farming on the higher adjacent ground. Riverside parkland with ornamental ponds or lakes is a feature of the upper reaches around New Alresford. With the relatively uniform flow of base-rich waters, and frequent reaches with low-intensity land use, much of the river is of high ecological quality with respect to both aquatic and riparian habitats. However, as a result of previous channel management, the river in some sections from Itchen Abbas to Eastleigh is wider than is needed to contain the natural flow. This inevitably leads to shallower depths and lower flow velocities, which in turn affect the character of the river.

The high conservation value of the River Itchen is reflected in the statutory designation of some long sections as Sites of Special Scientific Interest. These include reaches upstream and downstream of Winchester town centre and at Winnall Moors, where there is also a reserve of the Hants and I.o.W Wildlife Trust. Some 10km of corridor from King's Worthy upstream to Alresford are a SSSI, as is Alresford Pond. Habitats include old water meadow, other unimproved grasslands, fen, carr and wet woodland and the river itself as an example of a high quality chalk stream. A small and fragile population of otters has survived upstream of Winchester.

Further south, by the source of the Monks Brook tributary, unimproved grasslands on Eocene sands and clays have been notified and close by, on the edges of Eastleigh, the Wildlife Trust has a reserve at Flexford covering wet meadows and mixed woodland.

B9. CONSERVATION



Hampshire County Council has identified and recorded Countryside Heritage Sites. These are areas and features which are important for their nature conservation, scientific, historic or archaeological value. They include a number of meadows adjacent to streams in the catchment.

There are four Scheduled Ancient Monuments which are close to the river, being bridges at Alresford and Winchester, castle ruins at Wolvesey and a moated site at Otterbourne.

The important conservation sites within, or related to, the river corridor are shown on the map and listed on Table B9.1.

B9.3 Environmental Requirements

Water Quality

- Waters should comply with the minimum standards for amenity protection and aesthetic criteria (listed in Section B11: RECREATION AND AMENITY) and comply with the levels of List I and II substances in the EC directive 76/464/EEC for the general protection of the aquatic environment. Biological standards will also be applied in future as outlined in Section B5: STATUTORY WATER QUALITY OBJECTIVES.

River Flow

- A variable flow regime where the monthly averages reflect the natural flow conditions in the river. A variable flow regime is required to conserve the natural characteristics of the river such as emergent vegetation, river bed gravels, river margins and any associated wetland habitats. The natural mean monthly flow regime experienced in a mild drought is likely to be acceptable for non drought years in most river reaches. Monthly flows could be expected to fall below this critical threshold only during an actual drought period.
- Spate flows to inundate wetlands and to achieve natural cleansing of the river channel.

River Topography

- Maintenance of existing fringes of tree or marshland vegetation, and the encouragement of such vegetation in areas where they are presently of poorer quality.
- Maintenance and enhancement of natural river features such as emergent vegetation, meanders and pool: riffle sequences.
- Channels to be of appropriate cross-section for the flow regime.
- Limited access for livestock to the river corridor to minimise damage caused by trampling.
- Avoid damage to habitats due to too much public access.
- Consider archaeological constraints before carrying out any potentially damaging works and where appropriate enhance archaeological sites.

B9. CONSERVATION



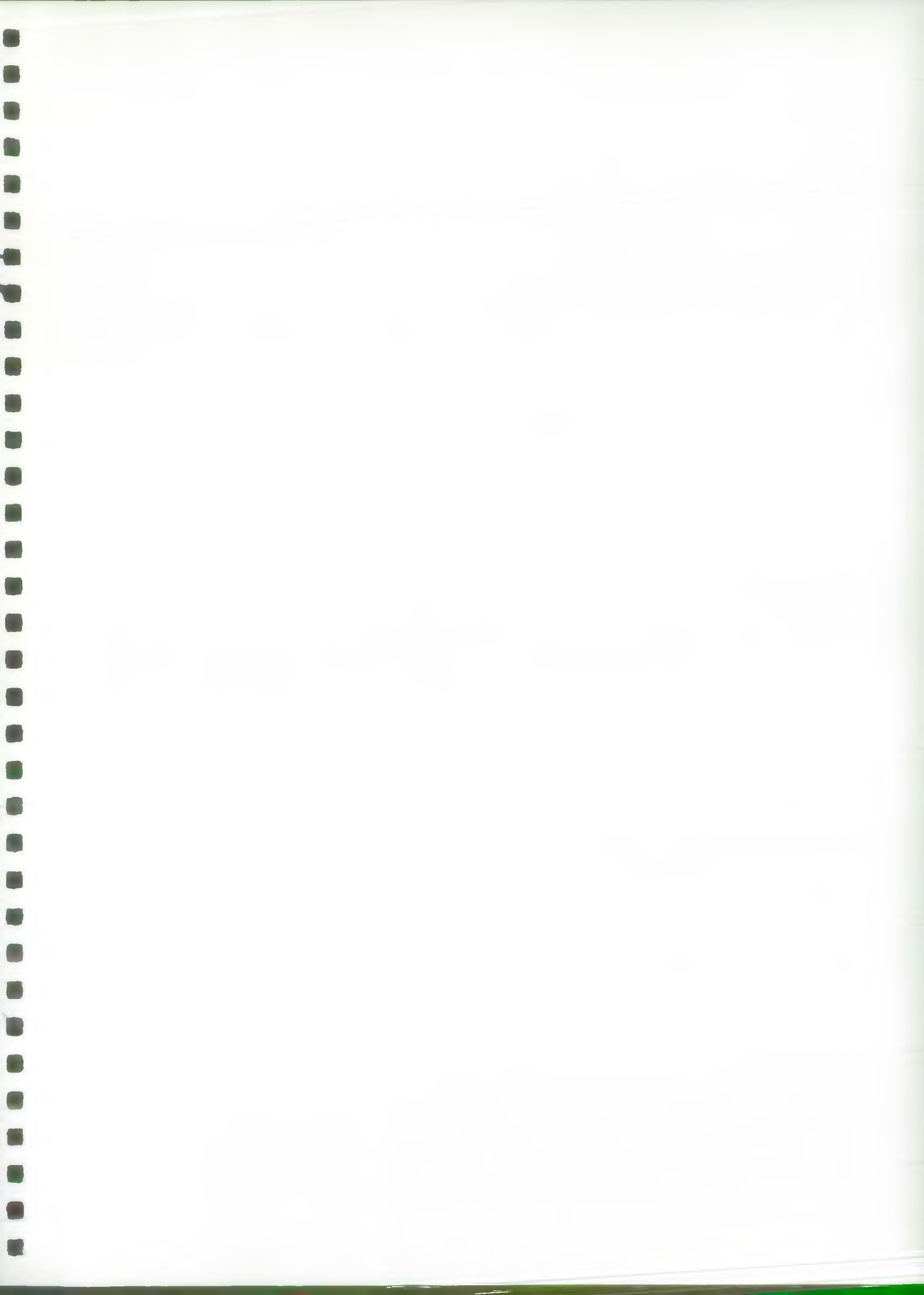
River Management

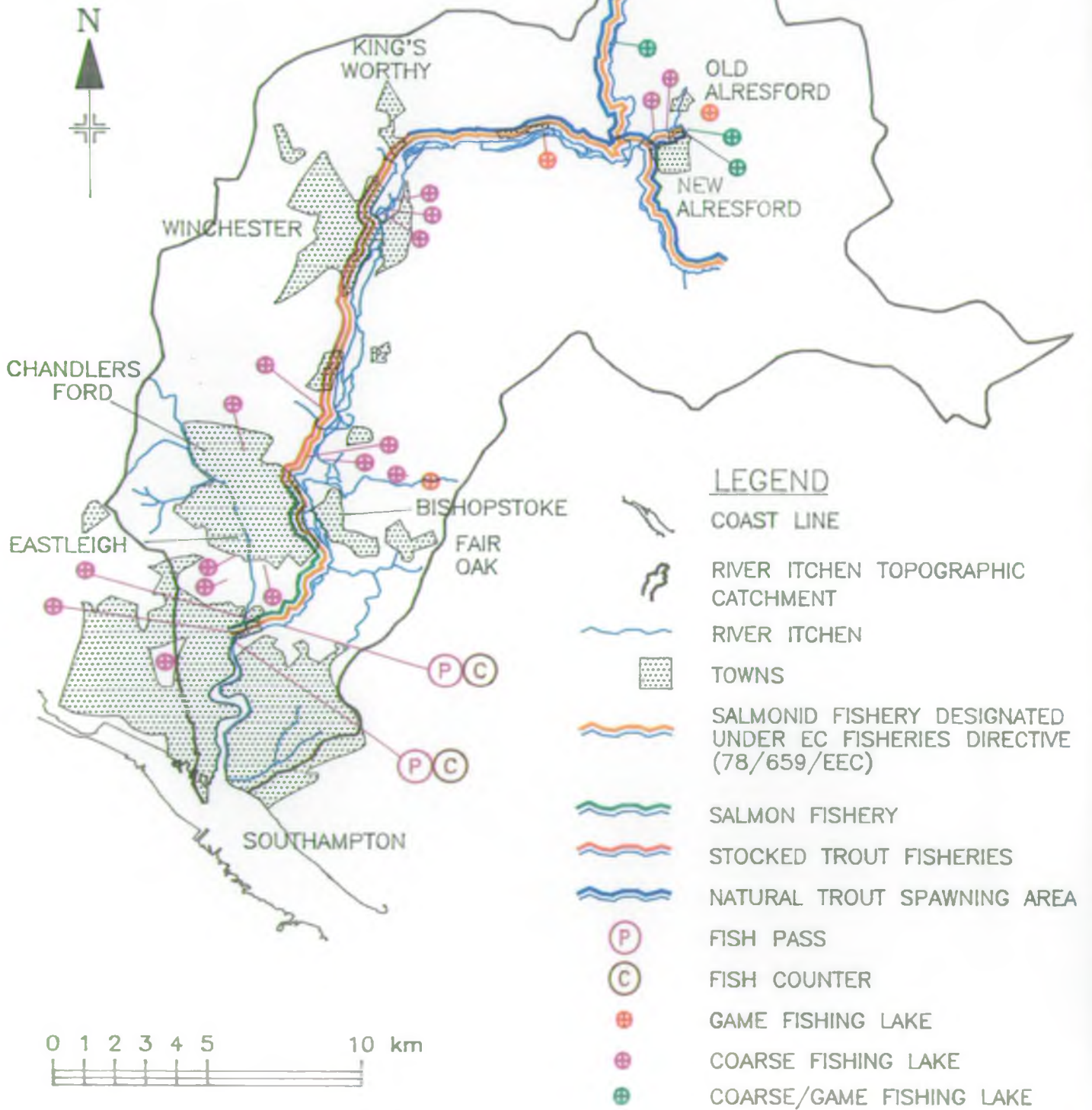
- Maintenance of emergent and aquatic instream plant communities.
- Operation of sluices and weirs to maintain channel water levels to protect adjacent wetland habitats.
- Maintenance and clearance of ditches in a way which encourages rather than destroys ecological diversity.
- Weeds should be cut back in the autumn to improve channel capacity for high winter flows and ensure the vegetation survives to grow again in the spring.
- Carry out river corridor surveys to determine the conservation value and requirements of river reaches.
- Co-operation with local authorities and riparian landowners to ensure banks and surrounding areas are free of litter and waste material.
- Encourage the take-up of the Countryside Stewardship Scheme for the preservation and re-creation of natural landscapes and wildlife habitats.
- Recognise the importance of the county and district Sites and Monuments Records.

Table B9.1 - Schedule of Designated Sites

Map Ref No.	Name	Designation	Reasons for Designation
	Itchen Valley:		
1	Cheriton-King's Worthy	SSSI	River, fen, carr and water meadow with rich and varied wildlife interest
2	Winchester Meadows	SSSI	
3	Winall Moors	SSSI/HWT	
4	Alresford Pond	SSSI	Lake and fen
5	Ratlake Meadows	SSSI	Species rich meadows
6	Flexford	HWT	Wet meadows
7	Marhill Copse & Meadow	CHS	Fen/arboretum
8	Highbridge Meadow	CHS	Species rich meadows
9	Mariners Meadow	CHS	Water meadows
10	Gaters Mill Meadow	CHS	Species rich meadows
11	Fair Oak School Meadow	CHS	Species rich meadows
12	Moated site, Otterbourne	AM	Moat
13	Wolvesey Castle ruins	AM	Castle ruins
14	High St., Winchester	AM	Ancient bridge
15	Alresford Bridge	AM	Ancient bridge

Note: SSSI Site of Special Scientific Interest
HWT Hampshire and Isle of Wight Wildlife Trust Nature Reserve
LNR Local Nature Reserve
CHS Hampshire County Council Countryside Heritage Site
AM Scheduled Ancient Monuments





FISHERIES

B10. FISHERIES



B10.1 General

This use relates to the maintenance of breeding populations of coarse and game fish and the use of the river by anglers. Game fish (also referred to as Salmonids) and coarse fish (Cyprinids) are protected under the EC Fisheries Directive (78/659/EEC) which sets water quality criteria to protect fish life in designated freshwater reaches. Additional reaches may be designated periodically or existing reaches upgraded.

Fish are sensitive to general conditions in the river since they are near the top of the aquatic food chain. They are distributed in a catchment according to geographical parameters, principally bed gradient and river flow, but modified by the quality of the water, which relates to the inputs of pollutants and nutrients. They are therefore important not just for their own presence but also as an indicator of the overall health of the river.

Anglers pursue their quarry, whether game or coarse fish, wherever they are found. Whilst their primary aim is to catch fish, they also enjoy outdoor activity in a harmonious environment. Both types of angling require a mixture of open and dense instream and bankside vegetation to provide variety for both the fish and the anglers.

B10.2 Local Perspective

B10.2.1 Game Fisheries

The Itchen catchment is world renowned as one of the finest trout fisheries in Britain. The Itchen, Candover Stream and Alre are all designated as salmonid fisheries under the EC Fisheries Directive. Salmon spawn from Eastleigh to Winchester and trout spawn from Eastleigh to the source. From Woodmill to Eastleigh the river supports a salmon fishery. There are also several lakes in the catchment where trout are artificially maintained.

Despite the high quality, there have recently been a number of problems facing the fisheries. These can be grouped into four main categories; low flows and levels, effects of changes to weed management, fish farm escapes and poor juvenile recruitment of salmon.

Low flows and levels have been caused by the extreme drought of recent years, which has had a severity of greater than 1 in 50 years. Both river flows and groundwater levels have at times been the lowest on record.

Changes to the timing of weed management have contributed to turbidity problems lingering into early summer.

Wild brown trout occur throughout the river, most commonly upstream of King's Worthy. Many trout are stocked, particularly between King's Worthy and Bishopstoke. Escapes of rainbow trout from table fish farms in the upper valley are considered to be a major problem, competing with native fish and sometimes dominating anglers catches.

B10. FISHERIES

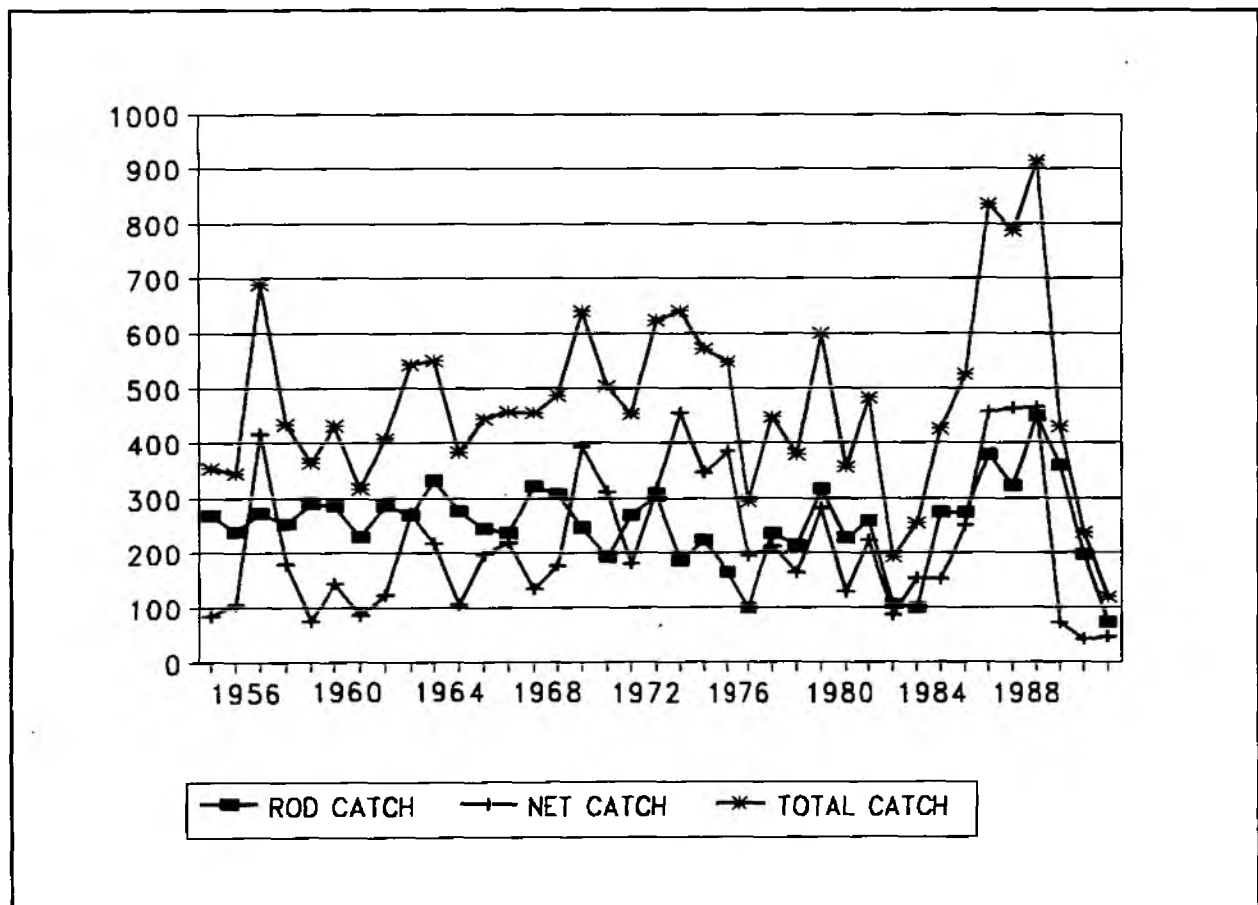


Figure B10.1 shows reported salmon catches from the Itchen rod and net fisheries between 1954 and 1991. There is considerable annual variation, especially in the net catches, but no overall trend is detectable in the early part of the series. The fisheries were badly affected by the drought of 1976, when low flows and high river temperatures deterred fish from entering fresh water, and there was a marked decline in catches over the period 1980-83.

The apparent recovery from 1986 to 1988 reflects increased fishing effort in the lower reaches. The subsequent decline in net catches was due to reduced effort in 1989, 1990 and 1991, but the collapse of the rod fishery gives cause for concern, being more sudden and severe than the general decline reported at this time from other British fisheries.

Fish counters installed on the Itchen show the number of returning adult salmon to be low and that up to 60% of them are caught in the river. Further studies have revealed a very low success rate for naturally spawned Itchen salmon eggs and that many redds (spawning sites) are heavily silted. In contrast, fry survival and growth are good, with stocked fry growing as well as native fish. NRA investigations are continuing, backed by a programme to improve the fishery by gravel cleaning, the provision of fish passes and restocking with young salmon (see Section E).

Figure B10.1 : Salmon Catch Returns



B10. FISHERIES



B10.2.2 Coarse Fisheries

There are no designated coarse fisheries in the Itchen catchment. However certain species of coarse fish are found in the rivers, some of which are considered to be less desirable species by the game fisheries. Those found include pike, grayling, roach, dace and eels, with the most abundant populations in the lower reaches of the river.

There are a number of lakes which are important for coarse fisheries, the more major of which are shown on the map.

B10.2.3 Angling

The angling interest in the Itchen catchment is intense. The Itchen itself, the Cheriton Stream, the Alre and Candover Stream are all fished, with salmon caught generally below Bishopstoke and trout above. A commercial net fishery operates under ancient rights at Woodmill.

The river is most intensely fished for trout in the stocked reaches between King's Worthy and Bishopstoke, with a lower intensity in the natural spawning areas further upstream.

In recent years the occurrence of coloured or turbid water has extended into the fishing season. This has been linked to poor weed growth in spring, often associated with the lack of an autumn weedcut in the previous year.

The various stillwater fisheries in the catchment provide an important resource for both game and coarse fishing. There is also a limited coarse fishery in the river between Woodmill and Gaters Mill.

The reduction in the salmon run, exacerbated by low flows and poor spawning success, is jeopardising the economic viability of the salmon fisheries.

B10.3 Environmental Requirements

Water Quality

- For designated reaches water quality not to deteriorate below the limits as specified in the EC Fisheries Directive (78/659/EEC).
- For reaches not specifically designated for the protection and enhancement of fisheries, but where significant fisheries occur, designation under the EC Freshwater Fisheries Directive should be sought.
- Angling waters to be aesthetically acceptable (see Section B11; RECREATION AND AMENITY) in order to enhance the sport of fishing. Guidelines on public health implications are awaited.

B10. FISHERIES



River Flow

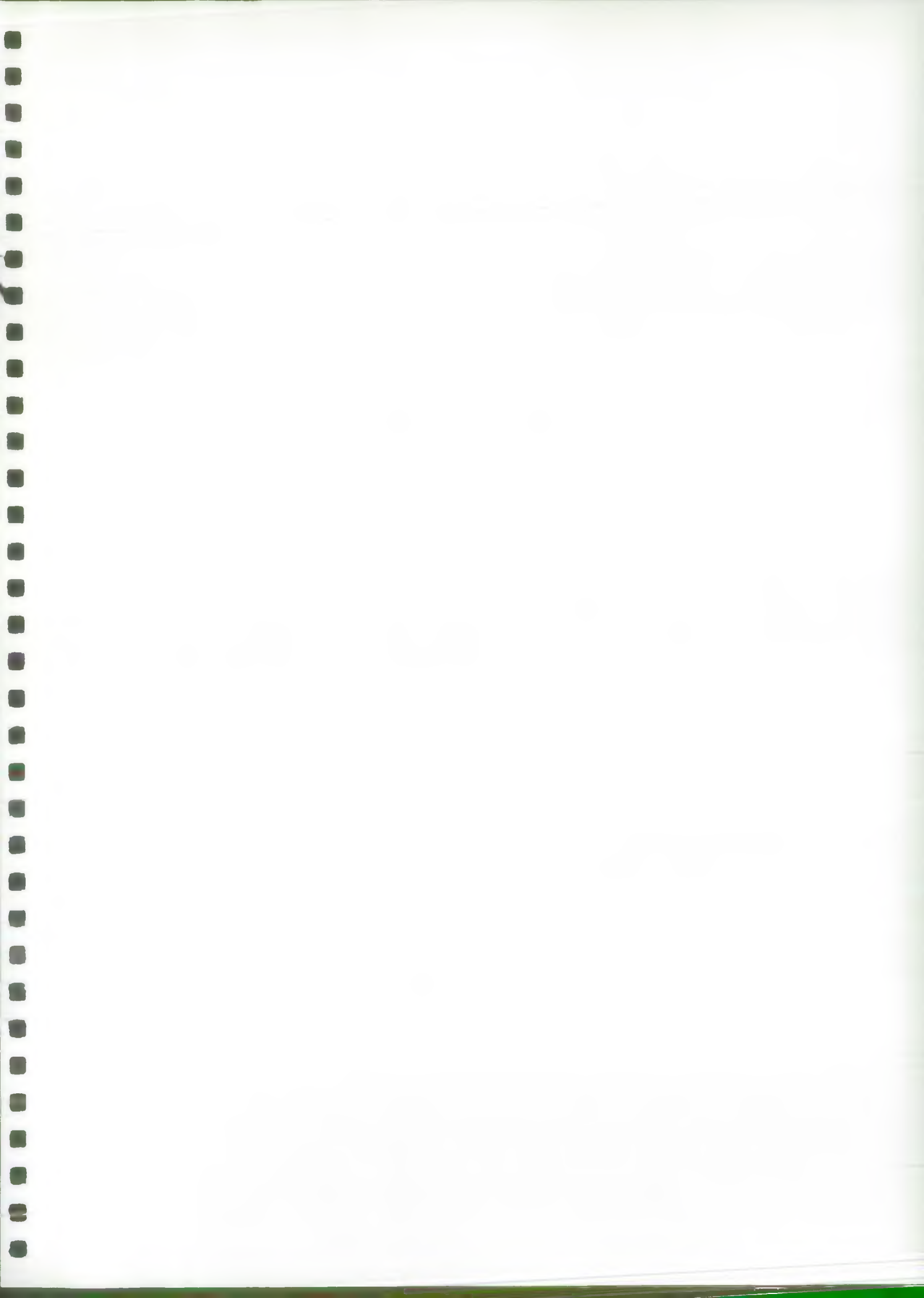
- To maintain the base flow and level in watercourses to maximise the production of fish, other fauna and aquatic and bankside flora as per Section B9: CONSERVATION.
- The natural flow regime should not be altered in a way which significantly inhibits fish migration.

River Topography

- Provide and maintain fish passes at identified obstructions to ensure the free passage of migratory salmonids. All barriers should be passable at low river flows.
- Diverse and natural river features to ensure a variety of spawning and feeding areas.
- Maintenance of sufficient access points for angling.
- Maintenance of a mixture of open and dense instream and bankside vegetation to provide adequate shade and cover.

River Management

- Control of weirs and stop boards to maintain water levels appropriate to angling.
- Weedcutting at appropriate intervals to maintain conditions for angling.
- Minimise the number of occasions when angling cannot take place due to river maintenance activities.
- Fish stocking should be appropriate to the reaches where it takes place.
- Provide and maintain high quality gravels for spawning in breeding reaches.
- Ensure fish farms prevent mass escapes of fish which can disrupt the ecology of the river.





WAYFARER'S WALK

KING'S WORTHY

OLD ALRESFORD

NEW ALRESFORD

CLARENDON WAY

WINCHESTER

WAYFARER'S WALK

CHANDLERS FORD

CANOEOING BY ARRANGEMENT WITH WINCHESTER CITY COUNCIL WITHIN BOUNDARY

BISHOPSTOKE










FAIR OAK

CANOEOING CENTRE

EASTLEIGH

ITCHEN VALLEY WALK

LEGEND

-  COAST LINE
-  RIVER ITCHEN TOPOGRAPHIC CATCHMENT
-  RIVER ITCHEN
-  TOWNS
-  CONTINUOUS FOOTPATH IN REACH
-  PARKLAND
-  PICNIC SITES
-  RIVERSIDE PUBLIC HOUSES
-  SAILING

SOUTHAMPTON

SOUTHAMPTON WATERSPORTS CENTRE



RECREATION AND AMENITY

B11. RECREATION AND AMENITY



B11.1 General

This use relates to those activities which attract people to the river corridor. Examples include walking, canoeing, swimming, boating and bird watching. The principal areas of concern are general aesthetic acceptability, access to the water course and, in the case of immersion sports, the health risk.

The Recreation and Amenity duties of the NRA are set out in Section 8 of the Water Act 1989 which generally empowers the NRA to conserve and enhance the natural beauty and amenity of inland and coastal waters and associated land, as well as the use of such waters and land for recreational purposes. The NRA is also required to have regard to the desirability of preserving public freedom of access and to take into account, either as a matter of its own activities or those of others, the likely effect specific action would have on any such freedom of access. The NRA may also actively promote proposals for recreational and amenity development where it is considered desirable.

This use also relates to commercial or recreational navigation. In tidal rivers there is a public right of navigation and there may also be the right to moor for unloading and loading, and in case of stress of weather or for changes in the tide.

Generally there is no right of navigation over non-tidal stretches of water unless one has been established through immemorial usage, by dedication by the riparian owners or by statute. Furthermore the extent of the rights are not as substantial as those prevailing on the tidal lengths of the same river. For instance there may be restrictions on the lengths of parts of rivers over which navigation can be exercised or on the type of craft. Certainly there would be no right of landing except by custom or grant, since the banks above tidal limits are owned by individuals rather than the Crown.

B11.2 Local Perspective

There is generally reasonable access to the river corridor with footpaths close to the River Itchen, Candover Stream, Cheriton Stream and River Alre. There are officially recognised long distance footpaths in the catchment such as the Itchen Valley Walk, Clarendon Way and Wayfarers Walk. The Pilgrims Way begins in Winchester, follows the Itchen and Alre to New Alresford and crosses into the Wey catchment en route to Canterbury.

The Itchen flows through parkland in a number of areas, including; Hinton Ampner; Tichbourne; Avington, where there is a picnic site; Winchester town centre and at Swaythling, where there is also a picnic site.

The Itchen is a high quality amenity with clear water and an attractive landscape setting. However, turbid waters and the presence of uncontrolled rafts of weeds following cutting can temporarily reduce this amenity value.

B11. RECREATION AND AMENITY



Navigation occurs extensively in the Itchen estuary below Woodmill and in Southampton Water. The Itchen Navigation from Woodmill to Winchester was a private venture which has not been used for a number of years and the right appears to have lapsed. A recent court case established that there is no public right of navigation on the Itchen above the tidal limit.

The practice of canoeing on the Itchen is restricted to within the boundary of Winchester by prior arrangement with Winchester City Council, and below Woodmill in the estuary.

B11.3 Environmental Requirements

Water Quality

- Minimum requirement being the protection of the amenity value of the water body.
- Waters to be free from surface films and obvious floating material, discolouration and unpleasant odour.
- Waters to be aesthetically acceptable for participants. Guidelines on public health implications are awaited.

River Flow

- Basic flow regime to minimise detriment to recreation and amenity is met by requirements detailed in Section B9 : CONSERVATION.

River Topography

- Maintenance of existing footpaths and access points.
- Sympathetic management and renovation of historical riverside artifacts (eg. Mills, weirs and bridges)
- Maintenance of existing landing and launching points, mooring facilities and storage areas for equipment.

River Management

- Co-operation with local authorities and riparian landowners to ensure banks and surrounding areas are free of litter.
- To encourage the clear communication and understanding of access rights and locations.
- Cut weeds, where appropriate, according to an agreed timetable to minimise interference with fisheries and amenity from rafts of cut weeds.

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

SECTION C : TARGETS

C1. RIVER FLOW TARGETS



This section considers the requirements for river flows to sustain the various river uses. Flow targets are set related to specific river uses and are stated below:

- A seasonal variation in flow is required to conserve the natural characteristics of the river. The natural mean monthly flow regime experienced in a mild drought is likely to be acceptable for non drought years in most river reaches. Monthly flows could be expected to fall below this critical threshold only during an actual drought period.

This target flow regime is set for all reaches where freshwater flow is a significant influence on the river corridor. This target also meets the requirement for a basic flow regime to minimise detriment to:

- Recreation and Amenity
- Game Fisheries
- Coarse Fisheries
- Angling

and to reduce the impact of:

- Intermittent and Diffuse Pollution.

- In migratory reaches the natural flow regime should not be altered in a way which significantly inhibits the migration of salmonid fish.
- There should be no diminution of the flow regime below that assumed in setting effluent discharge consents. These are normally set using Annual Q95 river flows.
- Minimum residual flows should be set for reaches of the river which are sensitive to reductions in flow, as the basis for Prescribed Flows and in order to control future abstraction licences. In particular cases consideration may be given to varying existing licences by including a Prescribed Flow control.

C2. WATER QUALITY TARGETS



The water quality requirements for the identified uses can now be combined to provide overall targets for the entire catchment. Clearly the quality requirements that apply to a particular reach of river are equal to the strictest requirements of any of the uses of the reach identified in this Plan.

As part of their proposals for Statutory Water Quality Objectives, the NRA have suggested water quality standards for a number of Use-related Classes. They also note that ongoing research projects are assessing standards for further Use-related Classes. However the consultation paper (Water Quality Series No. 5, December 1991) states that the suggested standards should be considered only as indicative at this stage. For this reason the standards are not included in this River Catchment Management Plan : Consultation Report.

In addition to standards for specific uses, the following more general requirements are considered to be targets for the catchment :

- To meet the NRA objective class for individual reaches as detailed in Section B5.
- To meet the general requirement to maintain river corridor conservation and amenity value as detailed in Sections B9 and B11.
- Implementation of the Southern Water Aquifer Protection Policy with respect to the licensing and operation of solid waste disposal sites.
- Implementation, on completion, of the NRA National Groundwater Protection Policy.
- To undertake routine water quality monitoring throughout the catchment in line with the NRAs stated aim of protecting and enhancing the quality of rivers, estuaries and coastal waters through the control of pollution.
- To seek designation under the EC Freshwater Fisheries Directive for reaches where significant game or coarse fisheries occur.

C3. RIVER TOPOGRAPHY TARGETS



This section considers the general requirements for the topography of the river and its corridor as well as the provision and maintenance of permanent facilities and access. The overall River Topography Targets for the catchment are collated from the individual uses and summarised in this Section. The nature of the features that are included under the term River Topography means that the targets involved can vary widely in scale. The intention here is not to identify, for example, points of access to the river wherever they are required, but rather to indicate the major topographical requirements of various reaches in relation to the uses concerned.

There are a number of specific uses with their own River Topography requirements. These are detailed in the table overleaf and, in addition, the following more general requirements are considered to be targets for the catchment:

- The Flood Defence Target Levels of Protection shown in Section B8.
- The maintenance of flood defence structures to ensure their continued effectiveness.
- No significant increase in flood risk as a result of new development.
- No new development to be in the flood plain unless adequate measures are taken to ensure no increase in flood risk.
- Presence of uncultivated bankside vegetation alongside the river to provide; habitats; shade and cover for fish; a buffer against diffuse pollution; and to enhance the quality of the landscape.
- The river should be of a width and depth appropriate to the flow regime.
- Presence of natural river features such as emergent vegetation, meanders and pool: riffle sequences for conservation of the river corridor and to enhance the quality of the landscape.
- Limited access to the river for livestock to minimise damage caused by trampling.
- To ensure the restoration of all waste disposal and mineral extraction sites to an acceptable environmental standard.
- New development not to reduce the conservation value of the river corridor.
- Maintenance of the integrity of the river banks and channel adjacent to mineral extraction sites.

C3. RIVER TOPOGRAPHY TARGETS



USE	REQUIREMENTS
Conservation	Maintenance of special features
Game Fisheries	Barriers to be passable to migratory fish at Q95 flows Natural River Features Shade and cover Clean gravel beds for spawning
Coarse Fisheries:	Natural River Features Shade and cover
Angling:	Sufficient access Maintenance of a mixture of open and dense instream and bankside vegetation Means to control water levels
Recreation and Amenity	Maintenance of existing footpaths and access points

C4. RIVER MANAGEMENT TARGETS



This section considers the regular activities for the management of the river and its bankside features which are necessary to enhance and maintain the various uses of the river. The overall River Management Targets are collated from the individual uses and summarised in this section.

The intention here is not to provide a maintenance schedule (for example the location, methods and frequency of weed cutting required for land drainage or fisheries management) but rather to indicate the major river management requirements in relation to the uses concerned.

There are a number of specific uses with their own requirements for River Management. These are detailed in the table overleaf and, in addition, the following more general requirements are considered to be targets for the catchment:-

- Co-operation with local authorities and riparian landowners to ensure banks and surrounding areas are free from litter.
- Carry out river corridor surveys to determine the conservation value and requirements of river reaches.
- Weedcutting to be carried out in a way that provides adequate flood protection but that ensures the continued survival of healthy aquatic vegetation.
- Carry out tree management to prevent obstructions caused by fallen trees.
- Maintenance and clearance of ditches in a way which encourages rather than diminishes ecological diversity.
- Maintenance of emergent instream plant communities.
- Weedcutting adjacent to gauging stations.

C4. RIVER MANAGEMENT TARGETS



USE	REQUIREMENT
Conservation:	Operation of sluices and weirs to protect wetland habitats. Maintenance of Special Conservation features.
Game Fisheries	Appropriate fish stocking High quality gravels to be identified and maintained.
Angling	Control structures to maintain water levels. Weedcutting at appropriate intervals.
Flood Defence	Ensure correct operation of sluice gates.

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

SECTION D : STATE OF THE CATCHMENT

D1. STATE OF THE CATCHMENT: RIVER FLOW



D1.1 General

The present conditions in the catchment are evaluated by considering the flow records, resource usage and abstraction licence conditions discussed elsewhere in this Plan. The state of the catchment is then obtained by comparing the present conditions with the use-related targets described in Section C1.

D1.2 Issues Identified:-

1. The major surface and groundwater abstractions between Otterbourne and Twyford, which are not subject to prescribed flows, result in significantly decreased river flows downstream of Otterbourne in the summer months.
2. A minimum residual flow of 86.4 MI/d has been agreed for the outflow of the Itchen to its estuary, but the abstraction at Gaters Mill is not subject to a prescribed flow condition as it operates under a Licence of Right.
3. An opportunity exists to develop the Itchen resource by an additional abstraction of 70 to 90 MI/d from the tidal limit (subject to prescribed flow conditions), supporting the abstraction by augmentation of river flows using the Candover and Alre augmentation schemes.
4. The discharge of suitably treated effluent is very important to the maintenance of river flows, and to the availability of additional resources at the tidal limit.

D2. STATE OF THE CATCHMENT : WATER QUALITY



D2.1 General

The present conditions in the catchment have been evaluated by considering the results of water quality sampling programmes over the period 1985 to 1990. The state of the catchment is then obtained by comparing the present conditions with the targets described in Section C2. The NWC compliance is derived from the 1990 National Comparative Survey conducted by the NRA.

Two specific types of failure can occur, either failure to meet the combined use related target or failure to meet the more subjective NWC river or estuarine target classification.

D2.2 Issues Identified:-

1. There are no recorded failures with respect to water quality in the Itchen catchment. All reaches comply with both specific use related standards where these exist, and their NWC target classes for 1990.
2. The chalk aquifer is vulnerable to pollution and it is very difficult to restore groundwater quality once contamination has occurred.
3. Water quality in the lower reaches of the river would deteriorate at times of low flow without augmentation of river flows to maintain dilution for sewage effluents.

D3. STATE OF THE CATCHMENT : RIVER TOPOGRAPHY



D3.1 General

The present conditions in the catchment are assessed by identifying problems due to failures to meet targets and conflicts between different uses on the same river reach.

The present levels of flood protection in the catchment are evaluated by considering past records of flooding, and taking account of flood defence schemes that have been carried out. The state of the catchment is then obtained by comparing the present standards with the targets.

D3.2 Issues Identified:-

1. The quality of the river corridor is generally very high with uncultivated bankside vegetation and natural river features. These provide shade, cover and variety to meet the requirements of game fisheries.
2. For some sections of the River Itchen between Itchen Abbas and Eastleigh, the cross-sectional area of the river channel is somewhat greater than would occur naturally. This is due to the permanent diversion of flows into carrier channels and the Itchen Navigation as well as the main river, and the widening of the channels due to erosion and bank management. The extra width of the river inevitably leads to shallower depths and lower flow velocities.
3. There are a large number of sluices and other control structures along the river which are privately owned and therefore not under the direct control of the NRA. The timely operation of these sluices during a flood event can have an impact on the extent of flooding.
4. Provided the sluice gates and other structures are operated correctly, the river meets its targets for Flood Protection.
5. Public access to the riverside for recreation and amenity is generally good, with footpaths like the Itchen Valley Walk and other facilities.
6. Migrating adult salmon are impeded by weirs and sluices in the Bishopstoke area.
7. Leakage of water from damaged banks and private control structures on high level carriers reduces flow, encourages weed growth and siltation, and has an adverse effect on amenity value.

D4. STATE OF THE CATCHMENT : RIVER MANAGEMENT



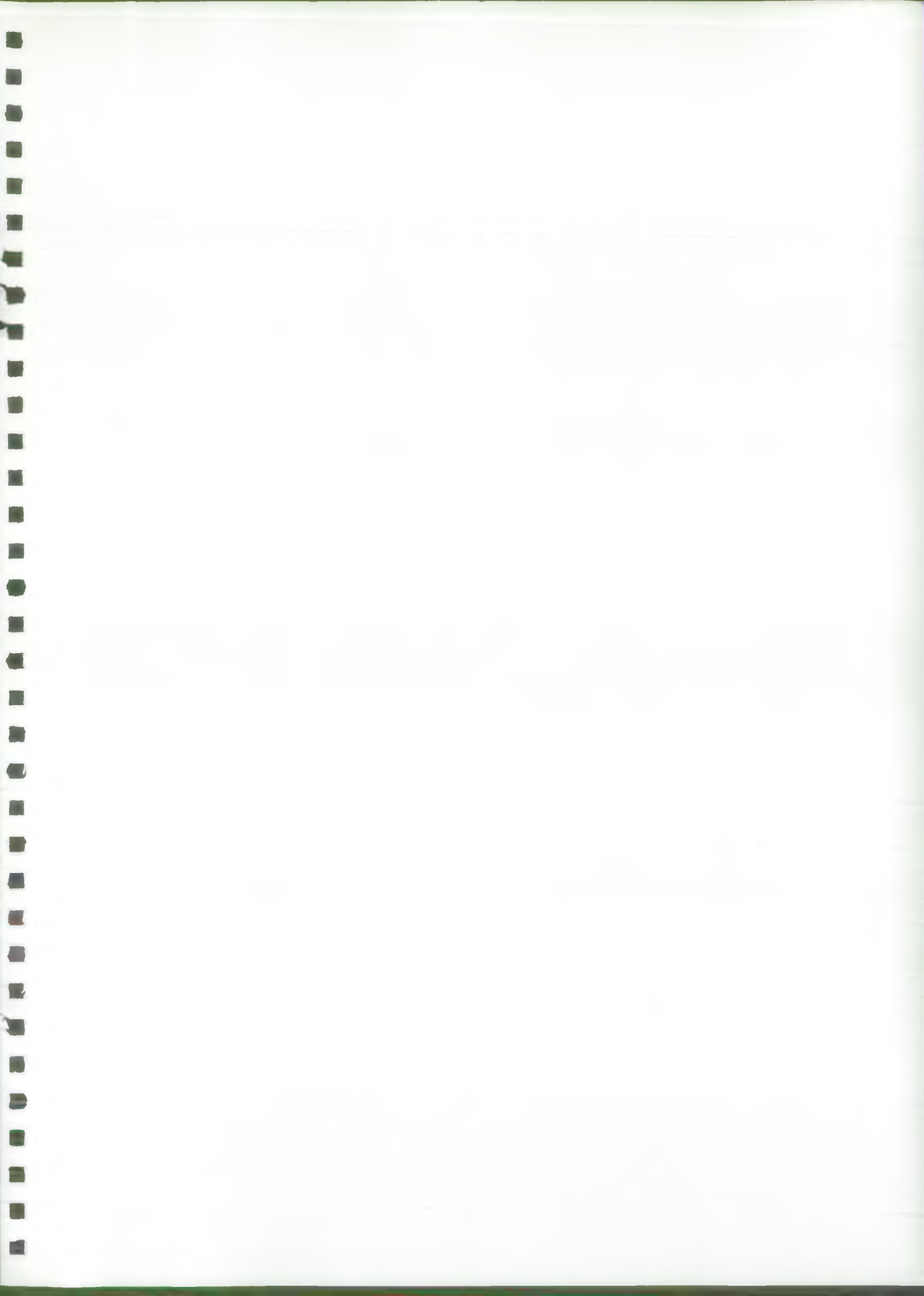
D4.1 General

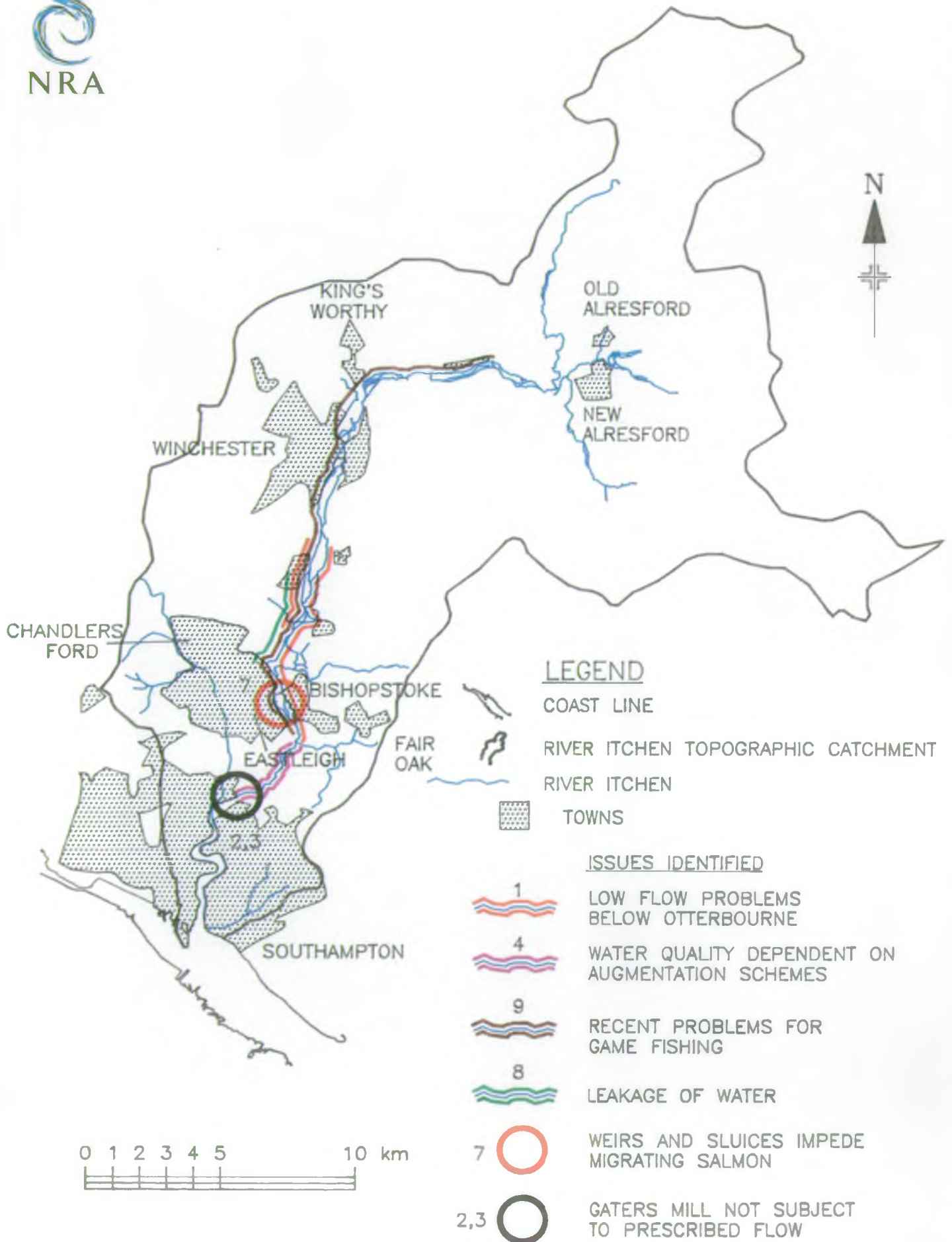
The present conditions in the catchment are assessed by identifying problems due to failures to meet targets and conflicts between different uses on the same river reach.

D4.2 Issues Identified:-

1. Shallow water, localised turbidity and lack of weed have caused problems to anglers in some recent years and inhibited the enjoyment of the sport. Whilst the drought has been partly to blame, over-wide streams and changes in river management practices have also contributed to the problem.
2. The salmon population of Hampshire rivers has declined steadily since the 1950s and there is poor juvenile recruitment of salmon. A research study is being carried out by the NRA Southern Region.
3. The cutting of aquatic weeds is necessary to meet the requirements of angling during the game fishing season. This is carried out by the landowners and river keepers in co-operation with the NRA. However, in order to maintain a healthy river, the weeds also need to be cut back before the onset of winter. Weed beds accumulate silt throughout the year and an autumn weed cut exposes this silt to the increased winter flows, which transport it out of the river system. Delaying cutting until the following spring causes later silt transport and high turbidity problems which may extend into the game fishing season. Uncut weeds are also more likely to be ripped out of the river bed, complete with their root system, during the higher flow conditions in late winter and spring. Once the complete plant has been removed from the river it is more difficult for the weed to re-establish itself than if the root system had been left in the river bed, as would result from weedcutting.

There is concern that this important autumn weed cut is not being carried out consistently along all reaches of the river.





STATE OF THE CATCHMENT: CONCLUSIONS

D5. STATE OF THE CATCHMENT : CONCLUSIONS



D5.1 General

In the preceding sections on the State of the Catchment a number of issues were highlighted relating to river flow, water quality, river topography and river management. The purpose of this concluding section is to draw together these issues into a number of clearly defined problems which are shown on the map and outlined in the following paragraphs. The possible effects of future changes to the catchment are also considered in very broad terms.

D5.2 Issues Identified:-

1. The major surface and groundwater abstractions between Otterbourne and Twyford, which are not subject to prescribed flows, result in significantly decreased river flows downstream of Otterbourne in the summer months.
2. A minimum residual flow of 86.4 Ml/d has been agreed for the outflow of the Itchen to its estuary, but the abstraction at Gaters Mill is not subject to a prescribed flow condition as it operates under a Licence of Right.
3. An opportunity exists to develop the Itchen resource by an additional abstraction of 70 to 90 Ml/d from the tidal limit (subject to prescribed flow conditions), supporting the abstraction by augmentation of river flows using the Candover and Alre augmentation schemes.
4. Water quality in the lower reaches of the river would deteriorate at times of low flow without augmentation of river flows to maintain dilution for sewage effluents. However, the discharge of suitably treated effluent is very important to the maintenance of river flows in the lower reaches, and to the availability of additional resources at the tidal limit.
5. The unconfined chalk aquifer is vulnerable to pollution.
6. The salmon population of Hampshire rivers is in decline, with poor recruitment of juveniles.
7. Migrating adult salmon are impeded by weirs and sluices in the Bishopstoke area.
8. Leakage of water from damaged banks and private control structures on high level carriers reduces flow, encourages weed growth and siltation, and has an adverse effect on amenity value.
9. Shallow water, localised turbidity and lack of weed have caused problems to anglers in some recent years. Whilst the drought has been partly to blame, over-wide streams and changes in river management practices have also contributed to the problem.

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

SECTION E : MANAGEMENT OPTIONS

E. MANAGEMENT OPTIONS



This section of the Plan considers options to address the issues identified in Section D5 : STATE OF THE CATCHMENT: CONCLUSIONS. These options represent the ideas of the Southern Region of the NRA at the time of production of this Consultation Report. They do not represent policy as this will only be finalised following the public consultation process.

Comments on these options and suggestions for new ideas are therefore positively encouraged.

The Management Options listed in this section identify the body who will probably be responsible for carrying them out. It is recognised that several of the options are outside the specific responsibility of the NRA. However the options are intended to be a blue print for the improvement of the river to meet the requirements of all its users. Inevitably this will involve many bodies and individuals working together to fulfil the common strategy represented by the River Catchment Management Plan.

The Management Options are addressed to alleviating and resolving the problems and conflicts identified in Section D5 : STATEMENT OF THE CATCHMENT: CONCLUSIONS. The following table lists the issue reference number from Section D5, a brief resume of the problem or conflict, the Management Options, the bodies likely to be responsible and, where appropriate, some of the 'pros' and 'cons' for each option.



Table of Management Options

Issue Ref. No. 1	Low flows downstream of Otterbourne		
Management Options	Responsible Bodies	Pros	Cons
Review Otterbourne and Twyford abstraction licences with a view to linking them to prescribed flow conditions.	NRA; Southern Water Plc	Protects river flows	Cost; Reduced reliability of supply
Move the surface water abstraction to the tidal limit.	NRA; Southern Water Plc	Improved river flows	Cost
Operate the Candover Augmentation Scheme when required.	NRA	Improved river flows	Cost; Artificial flow regime
Commission and license the Alre augmentation scheme.	NRA	Improved river flows	Cost; Artificial flow regime
Continue the policy that effluents are treated locally and discharged to the river or groundwater to conserve the resources of the catchment.	NRA; Southern Water Plc	Conserve water resource	Possible impact on water quality if river flow not maintained
Issue Ref No. 2	No prescribed flow controlling Gaters Mill abstraction		
Management Option	Responsible Bodies	Pros	Cons
Review the Gaters Mill abstraction licence.	NRA; Portsmouth Water Company	Improved river management and protection of low river flows	Cost; possible reduced reliability of supply.
Issue Ref No. 3	Develop new resource at the tidal limit		
Management Options	Responsible Bodies	Pros	Cons
License new abstraction subject to prescribed flow.	NRA; Southern Water Services; Portsmouth Water Company	Increase resource; Improve resource management; Replace upstream abstraction	Possible need for new water treatment plant
Commission and license the Alre augmentation scheme.	NRA	Improve river flows	Cost; Artificial flow regime

Issue Ref. No 4		Lack of dilution for effluents in lower reaches	
Management Options	Responsible Bodies	Pros	Cons
Transfer Otterbourne surface water abstraction to tidal limit.	NRA; Southern Water Services	Improved dilution	Cost; Replacement of treatment plant
Operate Candover augmentation scheme when required.	NRA	Improved dilution	Cost; Artificial flow regime
Commission and license the Alre augmentation scheme.	NRA	Improved dilution	Cost; Artificial flow regime
Improve the effluent standard for Eastleigh sewage treatment works.	NRA; Southern Water Services	Reduce pollutant input	High cost; Technical feasibility; Risk of causing the effluent to be discharged away from the river with consequent loss of resource
Issue Ref No. 5		Chalk aquifer is vulnerable to pollution	
Management Options	Responsible Bodies	Pros	Cons
Enforce the Aquifer Protection Policy and the National Groundwater Protection Policy when available.	NRA	Minimise risk of pollution	
Educate agriculture and industry to take proper care in the storage and handling of oils, fuels, chemicals, solvents and toxic substances.	NRA; Factory owners; Local Authorities; NFU; Inspectorate of Pollution; Water Companies; MAFF	Minimise risk of pollution	Cost of publicity, enforcement and inspection; Cost to industry and agriculture
Ensure that road drainage works incorporate measures to minimise pollution.	NRA; Department of Transport; Local Authorities	Minimise risk of pollution	Cost of additional works if necessary
Review the groundwater monitoring programme.	NRA	Prompt identification of problems and causes	Cost

Issue Ref. Nos. 6 and 7	Declining salmon population		
Management Options	Responsible Bodies	Pros	Cons
Investigate dynamics of salmon population.	NRA (in hand)		
Manage river gravels to improve spawning success.	NRA; Riparian owners; Test & Itchen Fishing Association	Reduce need for stocking; Maintain natural population	Cost; Access to river with suitable machinery
Support natural population by stocking with suitable young fish.	NRA; Angling interests; Test & Itchen Fishing Association	Immediate impact on problem	Cost; Availability of fish
Provide artificial in-stream incubators.	Ditto	Low cost solution	Availability of suitable adult fish; Risk of vandalism
Establish salmon hatchery in South-East England.	NRA	Maintain salmon population	Availability of suitable adult fish; Cost; Long-term need unless spawning habitat improved.
Provide fish passes where necessary.	NRA; Riparian owners	Encourages natural spawning	Cost
Issue Ref No. 8	Leakage from damaged banks and control structures		
Management Options	Responsible Bodies	Pros	Cons
Repair banks and structures.	NRA; Riparian owners	Improved conservation of river flow	Cost; Manpower requirement
Control burrowing animals.	Ditto	Ditto	Ditto
Ensure fair distribution of flow between carriers.	Ditto	Ditto	Ditto

Issue Ref No. 9	Localised turbidity, shallow water and lack of weed.		
Management Options	Responsible Bodies	Pros	Cons
Infill over-deep sections.	Riparian Owners; NRA; Test and Itchen Fishing Association	Improved main- stream flow	Cost
Close off flow to some of carrier channels.	Riparian Owners; Test and Itchen Fishing Association	Improved flow velocity	Loss of fishing space; Potential effects on ecology of carriers
Reducing stream width where necessary, as has been carried out near Easton.	Riparian Owners; Test and Itchen Fishing Association	Improved flow velocity	Cost; Potential loss of bankside habitat
Return to traditional river management practices (autumn weedcut, gravel raking, mudding etc.).	Riparian Owners; Angling interests; Test and Itchen Fishing Association	Reduced siltation; Improved substrate and healthier aquatic weed	Manpower requirement; Cost
Refuse licences for consumptive abstraction from the chalk aquifer.	NRA	Conserve river flow	Reduced abstraction potential
Ensure that future water demand is supplied from the bottom of the catchment.	NRA; Water Companies	Conserve river flow	Cost
Ensure that effluents are treated locally and discharged to the river or groundwater to conserve the resources of the catchment.	NRA; Southern Water Services; Industry; NFU	Conserve river flow	Cost; Possible impact on water quality

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

APPENDIX 1 : GLOSSARY OF TERMS AND UNITS

GLOSSARY OF TERMS AND UNITS



1. COUNTRY STRUCTURE PLANS

Statutory document produced by County Council outlining strategy for development for a 10-15 year timescale.

2. DISTRICT LOCAL PLANS

Statutory document produced by District or Borough Council to implement strategy for development set out in County Structure Plan. Specific land use allocations are identified.

3. mAOD

Metres above ordnance datum.

4. TOTAL RAINFALL

Rainfall as measured by rain gauge.

5. EFFECTIVE RAINFALL

Total rainfall minus actual evapotranspiration. (direct evaporation plus transpiration).

6. DIFFERENT UNITS FOR FLOW MEASUREMENT

m³/s Cubic metres per second

l/s Litres per second

MI/d Megalitres per day

mgd Millions of gallons per day

Conversion Table

m ³ /s	MI/d	mgd
0.012	1	0.224
0.06	5	1.12
0.12	10	2.24
0.24	20	4.48
0.6	50	11.2
1.2	100	22.4



7. **ISOHYETALS**
Contours of equal mean annual rainfall
8. **HECTARE**
Unit of area to 2.471 acres.
9. **WET FENCING**
Water filled ditches used for control of livestock.
10. **MARSH FEEDING**
Supply of water to marsh areas during the summer period for both wet fencing and spray irrigation abstractions.
11. **EMERGENT VEGETATION** - plants with roots in the river bed but which emerge from the water, often at the banks. Examples include reeds, irises and bullrushes.
12. **POOL : RIFFLE** - a stretch of river with alternate sections of shallow faster flowing water and deeper slower moving pools.
13. **SPATE FLOWS**
Periodic fresh water flood flows.
14. **NATURAL FLOW REGIME**
The natural flow record prior to the influence of man, i.e. with no abstraction from or discharge to the catchment.
15. **Q95**
Flow that is exceeded for 95 percent of the flow record.
16. **SALMONIDS**
Salmon (*Salmo salar*), Brown and Sea Trout (*Salmo trutta*) and Rainbow trout (*Salmo gairdneri*).
17. **CYPRINIDS**
All non-salmonid freshwater fish.
18. **HIGH SEAS RIGHTS** - Common law rights of navigation on tidal waters where no specific authority exists.



19. **ABSTRACTION LICENCE**

Licence to abstract water. The maximum annual daily and hourly abstraction rates are set within the terms of the licence.

20. **MEAN LICENSED ABSTRACTION**

In this Plan, the mean licensed abstraction is the maximum annual abstraction within the terms of the licence, expressed in terms of megalitres per day.

21. **ACTUAL ABSTRACTION**

Annual actual abstraction totals are shown in the plan, expressed in terms of megalitres per day. Individual actual abstractions are returned to the NRA each year. These data are confidential.

22. **POTABLE WATER SUPPLY**

Water supplied for domestic use including human consumption.

23. **PRIMARY GAUGING STATION**

A permanent flow gauging installation included in the National Surface Water Archive.

24. **MINIMUM RESIDUAL FLOW (MRF)**

A minimum flow setting at a gauging station, related to the flow requirements for downstream river reaches.

25. **PRESCRIBED FLOW**

A flow setting at a gauging station, incorporated into an abstraction licence, such that abstraction must cease once the flow recorded at the gauging station reduces below this flow. Prescribed flows are set at or above the Minimum Residual flow setting at the gauging station. The prescribed flow is increased periodically for new licences.

26. **IMPOUNDMENT RESERVOIR**

Surface water storage area formed by construction of a dam across a river or stream and supplied only by natural inflow from the upstream catchment.

27. **PUMPED STORAGE RESERVOIR**

Surface water storage area, as above, with natural inflow supplemented by a pumped inflow from a separate source, typically a nearby river.



28. **DROUGHT ORDER**

Order, issued by the Secretary of State, under which

- (i) variations to the terms of abstraction licences and/or
- (ii) reductions in the levels of service to consumers are sanctioned.

29. **PERENNIAL FLOW**

River flow present through the entire year.

30. **EPHEMERAL FLOW**

River flow not present through the entire year.

31. **MHWS**

Mean High Water Spring Tides.

RIVER ITCHEN CATCHMENT MANAGEMENT PLAN

APPENDIX 2 : MISSION STATEMENT

MISSION STATEMENT



The National Rivers Authority will protect and improve the water environment. This will be achieved through effective management of water resources and by substantial reductions in pollution. The Authority aims to provide effective defence for people and property against flooding from rivers and the sea. In discharging its duties it will operate openly and balance the interests of all who benefit from and use rivers, ground waters, estuaries and coastal waters. The Authority will be businesslike, efficient and caring towards its employees.

AIMS

- to achieve a continuing improvement in the quality of rivers, estuaries and coastal waters, through the control of water pollution;
- to assess, manage, plan and conserve water resources and to maintain and improve the quality of water for all those who use it;
- to provide effective defence for people and property against flooding from rivers and the sea;
- to provide adequate arrangements for flood forecasting and warning;
- to maintain, improve and develop fisheries;
- to develop the amenity and recreation potential of waters and lands under NRA control;
- to conserve and enhance wildlife, landscape and archaeological features associated with water under NRA control;
- to improve and maintain inland waterways and their facilities for use by the public where the NRA is the navigation authority;
- to ensure that dischargers pay the cost of the consequences of their discharges and, as far as possible, to recover the cost of water environment improvements from those who benefit;
- to improve public understanding of the water environment and the NRA's work;
- to improve efficiency in the exercise of the NRA's functions and to provide challenge and opportunity for employees and show concern for their welfare.



NRA

National Rivers Authority

Southern Region

Regional Office
Guildbourne House Chatsworth Road
Worthing West Sussex BN11 1LD
(0903) 820692