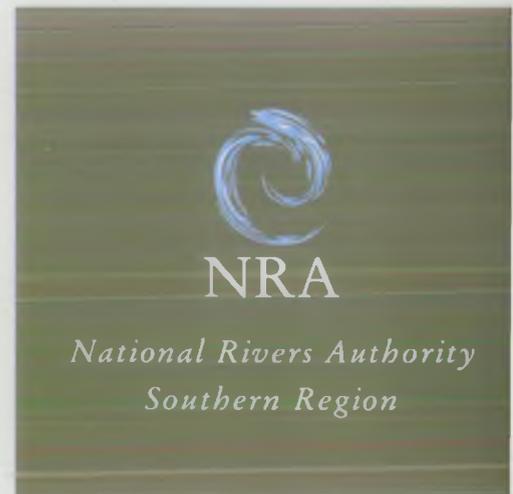


ISLE OF WIGHT CATCHMENT MANAGEMENT PLAN CONSULTATION REPORT



MISSION STATEMENT

The NRA's mission is :

"We will protect and improve the water environment by the effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from and use rivers, groundwaters, estuaries, and coastal waters. We will be businesslike, efficient and caring towards our employees".

Our Aims are to :

- * Achieve a continuing overall improvement in the quality of rivers, estuaries and coastal waters, through the control of pollution.
- * Manage water resources to achieve the right balance between the needs of the environment and those of the abstractors.
- * Provide effective defence for people and property against flooding from rivers and the sea.
- * Provide adequate arrangements for flood forecasting and warning.
- * Maintain, improve and develop fisheries.
- * Develop the amenity and recreation potential of inland and coastal waters and associated lands.
- * Conserve and enhance wildlife, landscape and archaeological features associated with inland and coastal waters of England and Wales.
- * Improve and maintain inland waters and their facilities for use by the public where the NRA is the navigation authority.
- * Ensure that dischargers pay the costs of the consequences of their discharges, and, as far as possible, to recover the costs of environment improvements from those who benefit.
- * Improve public understanding of the water environment and the NRA's work.
- * Improve efficiency in the exercise of the NRA's functions and to provide challenge and opportunity for employees and show concern for their welfare.

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Published May 1995

ENVIRONMENT AGENCY



099846

Isle of Wight Catchment Management Plan

*Isle of Wight Catchment Management Plan
Consultation Report*

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Accession No APEL

WHAT IS CATCHMENT MANAGEMENT PLANNING?

The Water Act 1989 established the National Rivers Authority (NRA) as the "Guardian of the Water Environment", a non-departmental government organisation with 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.

NRA Regions are defined by river basins catchments - singly, as in the Thames Region (which is divided into sub-catchments), or in geographical groups of individual rivers. 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 that of a statutory regulator controlling the actions of others. However, the Plans also offer an opportunity for input from the public to the development of NRA policy, and for the Authority itself to draw attention to its 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.

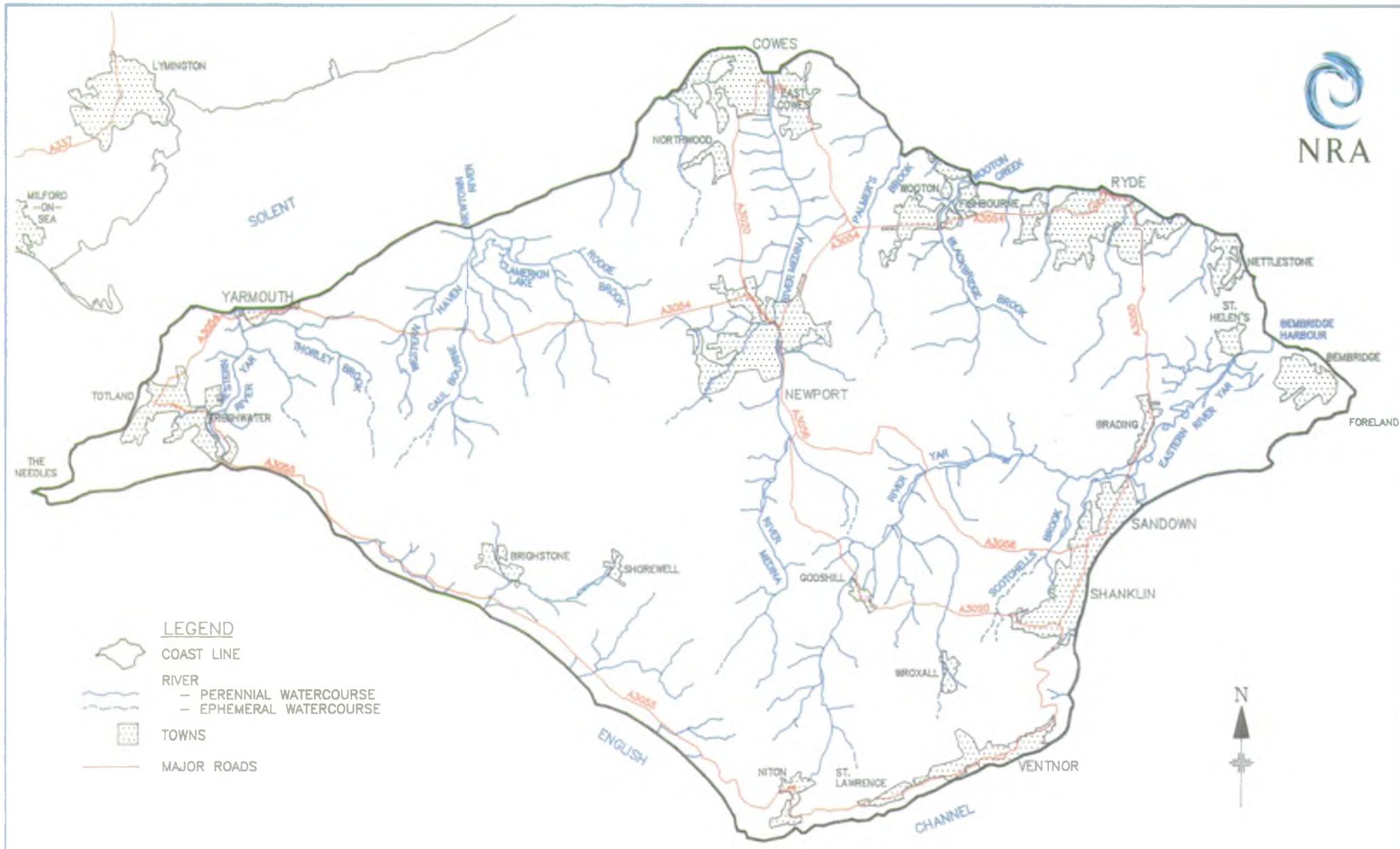
The NRA consults widely with interested organisations and the general public before definitive Catchment Management Plans are published. This Consultation Report is the first stage of the process and will be followed by a Final Report and Action Plan. The NRA will review Catchment Management Plans annually and they will normally be revised at five year intervals.

If you have any comments on this Consultation Report, please write to

The Catchment Planning Coordinator
Guildbourne House
Chatsworth Rd
Worthing
West Sussex
BN11 1LD

The consultation period closes on 1 September 1995.

SECTION A:
GENERAL INFORMATION



LEGEND

- COAST LINE
- RIVER
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
- TOWNS
- MAJOR ROADS



THE CATCHMENT



Isle of Wight Catchment Management Plan

SECTION A : GENERAL INFORMATION

A1. THE ISLE OF WIGHT CATCHMENT

The Isle of Wight is separated from Hampshire by the Solent, a channel some five kilometres wide, narrowing to less than two kilometres at its western end. The Island resembles a diamond, measuring thirty eight by twenty two kilometres and has a total area of 381 km². The central Chalk ridge, running east-west across the Island, has been uplifted to form a monocline with near vertical bedding and represents the southern rim of the Hampshire Basin. To the north, the Chalk is overlain by Tertiary sands, clays and gravels: to the south, the Island was once covered by Chalk, but this has been eroded to expose a varied sequence of Wealden Beds which provide light sandy soils drained by small spring-fed streams. Only the Chalk cap of St Catherine's and St Boniface Downs remains as a conspicuous feature of the southern coastline.

The central Chalk ridge is a half to one kilometre wide, with an undulating crest, and is dissected by river valleys. On the south and east coasts of the Island, where clays and sands are exposed to the sea, there are extensive landslips and coastal erosion is a problem. The instability of the cliffs is increased by groundwater moving through the relatively soft rocks, and is evident in areas such as Blackgang Chine and Brook Bay, where the coast is receding rapidly. Whilst in Victorian times it was possible to walk to the sea down Blackgang Chine, there is now a cliff up to 100m high, and fields, roads and properties are being lost to the sea.

Until well after the last ice age the Isle of Wight was part of the mainland. A major river flowed eastwards along the line of the Solent, from Wareham in Dorset to the sea in the Littlehampton area. Its tributaries would have included the Avon, Test, Itchen and Arun, together with streams draining from the northern slopes of Purbeck and the Isle of Wight. Rising sea levels and coastal erosion eventually breached the isthmus connecting the Island to Purbeck and the river valley was drowned by the sea.

With the exception of a few brooks on the South coast all the Island's streams now flow northwards. In addition to the Medina, which bisects the Island from south to north, these include the Western Yar and Caul Bourne in the west, and Palmer's, Blackbridge and Monktonmead Brooks, and the Eastern Yar, to the East. Altogether, more than fifty separate catchments drain to tidal waters.

The Rivers Medina and Eastern Yar both rise as Chalk springs from St. Catherine's Down at the southern tip of the island. The Eastern Yar, with a catchment of 76 km², flows 27 km to Bembridge Harbour, collecting Wroxall Stream, Scotchell's Brook and a number of small tributaries before it cuts through the central Chalk ridge at Brading. The River Medina is 17 km long, with a catchment of 71 km², flowing due north to cut through the Chalk ridge at Shide. Lukeley Brook, a Chalk stream which rises in the Bowcombe Valley above Carisbrooke Castle, joins the Medina at the head of its estuary in Newport.

The Western Yar is effectively an estuary where most of the upper freshwater catchment has been destroyed by coastal erosion, an extreme example of river capture. It must once have been one of the largest rivers on the island, but today, without flood protection works at Freshwater Gate, the river would be open to the sea at both ends. The resident population of the Island is approximately 127,000, the main towns being Ryde, Newport and Cowes. The catchment is predominantly rural, with mixed farming over most of the area and intensive horticulture in the Eastern Yar valley. There is very little manufacture on the island; by far the most significant income is from tourism and the leisure industry, with Cowes and the Medina estuary having an international reputation for yachting and watersports.

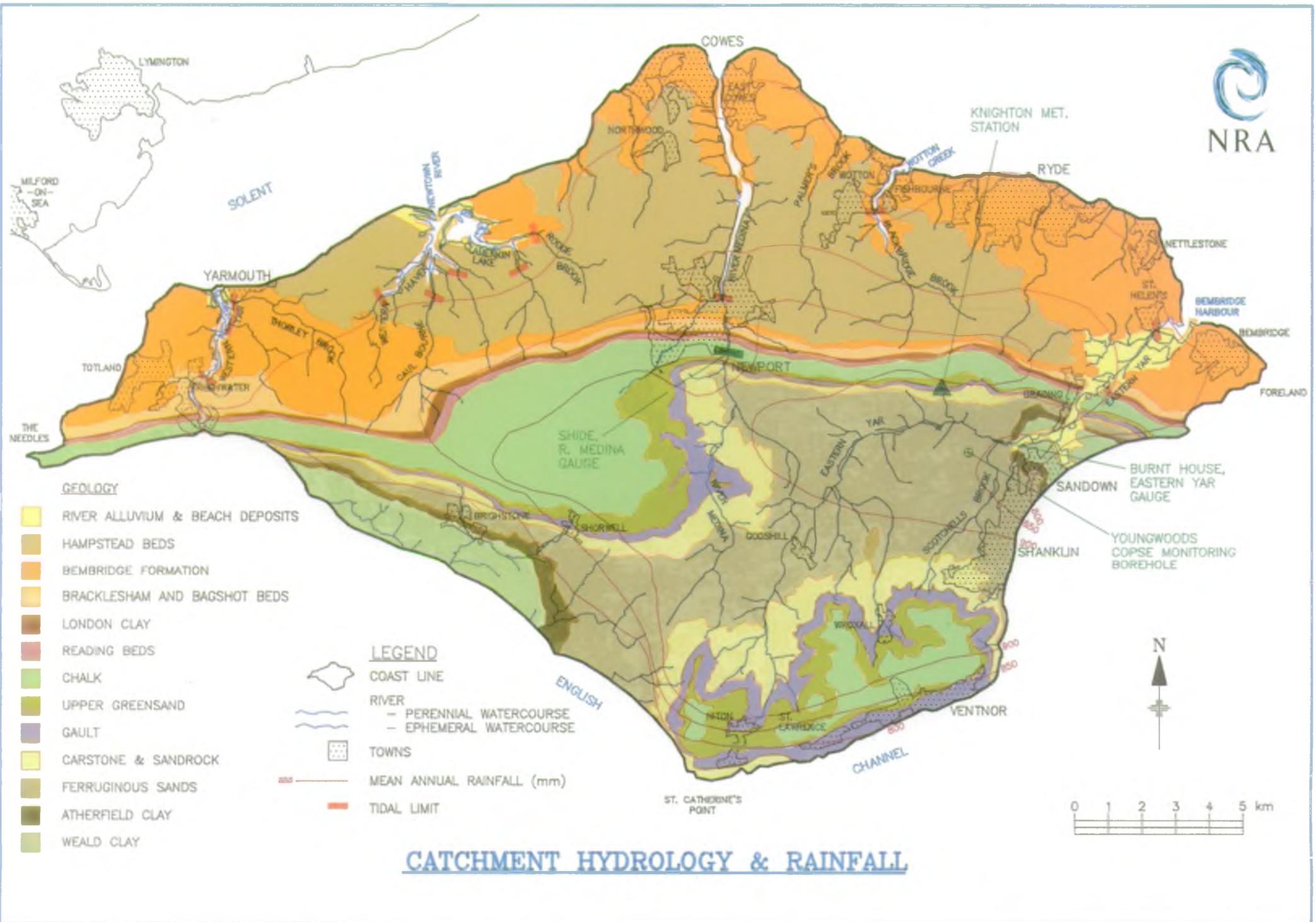
Isle of Wight Catchment Management Plan

The main sources of water for public supply on the island are the Eastern Yar and groundwater in the Chalk and Greensand aquifers. Summer tourism creates a large seasonal demand which can be met by water transferred from Testwood, on the mainland, using a trunk main that runs under the Solent. Being a self-contained supply area, the Island was selected for the national water metering trial and most properties are metered. Most waste water is discharged to tidal waters or the sea, although a few villages are served by small sewage works.

Much of the Island is classified as an Area of Outstanding Natural Beauty (AONB) or as Heritage Coast, nature conservation is important at sites such as Newtown Harbour and an application has been made to MAFF to designate the Eastern Yar as an Environmentally Sensitive Area (ESA). There are many ancient monuments; Carisbrooke Castle, famous for its donkey well, was long used as a secure place of exile and numbered King Charles I amongst its inmates.

Due to the small size of its rivers the Island has no significant freshwater fisheries, although the lower reaches of the Eastern Yar and some ponds are fished for coarse fish. A few small lakes are stocked as put-and-take trout fisheries.

A2 : HYDROLOGY AND RAINFALL



GEOLOGY

- RIVER ALLUVIUM & BEACH DEPOSITS
- HAMPSTEAD BEDS
- BEMBRIDGE FORMATION
- BRACKLESHAM AND BAGSHOT BEDS
- LONDON CLAY
- READING BEDS
- CHALK
- UPPER GREENSAND
- GAULT
- CARSTONE & SANDROCK
- FERRUGINOUS SANDS
- ATHERFIELD CLAY
- WEALD CLAY

LEGEND

- COAST LINE
- RIVER
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
- TOWNS
- MEAN ANNUAL RAINFALL (mm)
- TIDAL LIMIT

CATCHMENT HYDROLOGY & RAINFALL

A2. HYDROLOGY AND RAINFALL

A2.1 General

A proportion of the rainfall which falls on the catchment is lost through direct evaporation and transpiration from plants and trees. The remainder is termed the effective rainfall and is the total water resource available to the catchment, which may be manifest as surface run-off to streams and rivers, or as recharge to the groundwater aquifer.

The allocation of rainfall between surface and groundwater is largely dependent on the surface geology. Low permeability clay and silt areas result in high run-off to a strongly developed surface drainage system, whereas porous Chalk and sandstone catchments allow a higher proportion of recharge to groundwater. In the latter case, the surface drainage system is less well developed and a large part of river flow is derived from groundwater as springs or as upflow through the river bed.

Surface flows in clay catchments respond rapidly to high rainfall and drought periods, leading to considerable seasonal variation in the water resource available at a river intake. The low-flow yield of such "flashy" catchments can be enhanced by the reservoir storage of water abstracted during periods of high flow.

Aquifers provide natural water storage for a catchment, groundwater systems react to rainfall much more slowly than surface waters and generally provide a more reliable resource during drought periods. However, recovery from drought may also take longer.

A2.2 Local Perspective

The topography of the island is heavily influenced by the underlying geology. The highest point is Shanklin Down, part of the southern Chalk outcrop which also underlies the distinctive cliffs of the south coast. The other prominent upland area is the central Chalk ridge which runs east to west across the widest part of the island. The clays and sands which cover the rest of the island are relatively easily eroded and result in a low relief topography.

The geology of the island also has a major influence on its drainage pattern, virtually all the rivers drain northwards, either from the southern Chalk block or from the central Chalk ridge. The two largest rivers, the Medina and the Eastern Yar, are fed by springs from the southern Chalk and have cut distinct gaps in the central Chalk ridge. Many smaller streams have similar characteristics, with groundwater providing a reliable baseflow which is overprinted by the flashy run-off from the clays and sands of the lower reaches. The hydrograph (see Hydrometric Data diagram) for the Eastern Yar at Burnt House Gauging Station is typical in this respect.

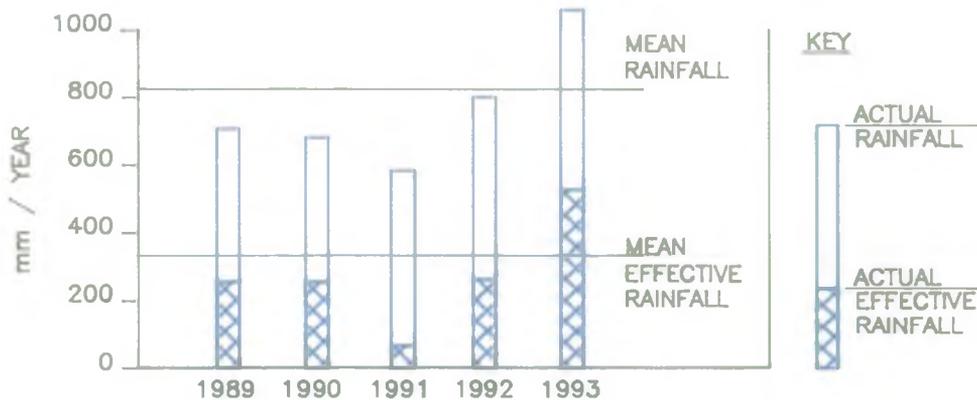
A2.3 Meteorological Considerations

Mean annual rainfall on the Isle of Wight is approximately 850 mm, dropping to 662 mm in a one in ten drought year. After allowing for evaporation losses and the water used by plants, the effective rainfall in an average year is around 350mm.

Annual rainfall from 1989 to 1992 was below average, with 1991 being a particularly dry year, resulting in low river flows and reduced yields from water sources. In contrast, 1993 was wet; approximately 19% of the annual total fell in December causing extensive flooding, which was estimated to have a return

Isle of Wight Catchment Management Plan

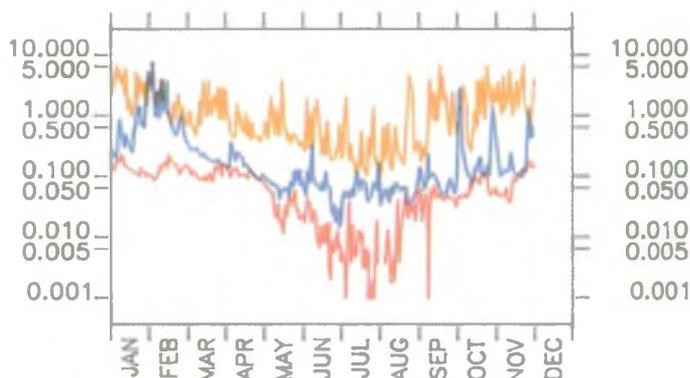
frequency of once in thirty years.



Annual Rainfall Record from Knighton Met. Station at SZ567868
Actual Evapotranspiration Data from MORECS Database (Sq 182)

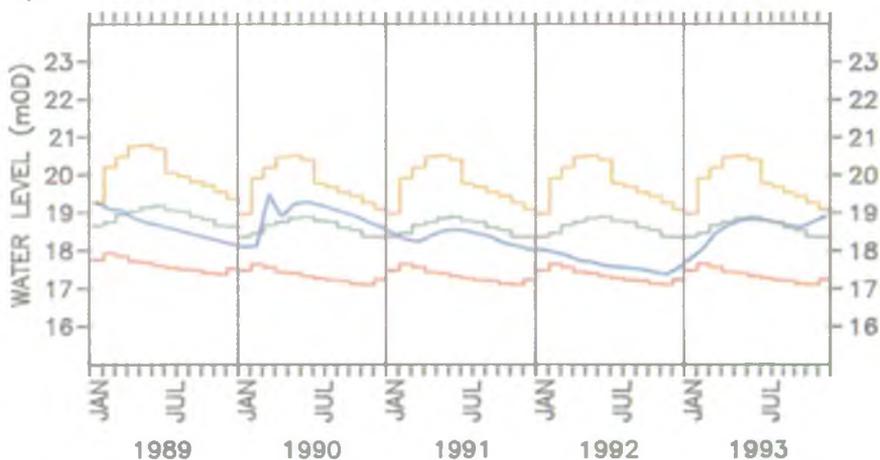
DAILY FLOW HYDROGRAPH ($m^3 s^{-1}$)

Max. and min. daily mean flows from 1964 to 1992 with an example yearly hydrograph (1993)



EAST YAR AT BURNT HOUSE

Site name : YOUNGWOODS COPSE
National grid reference : SZ 5744 8502 Well number : 0400101034
Aquifer : CHALK AND UPPER GREENSAND

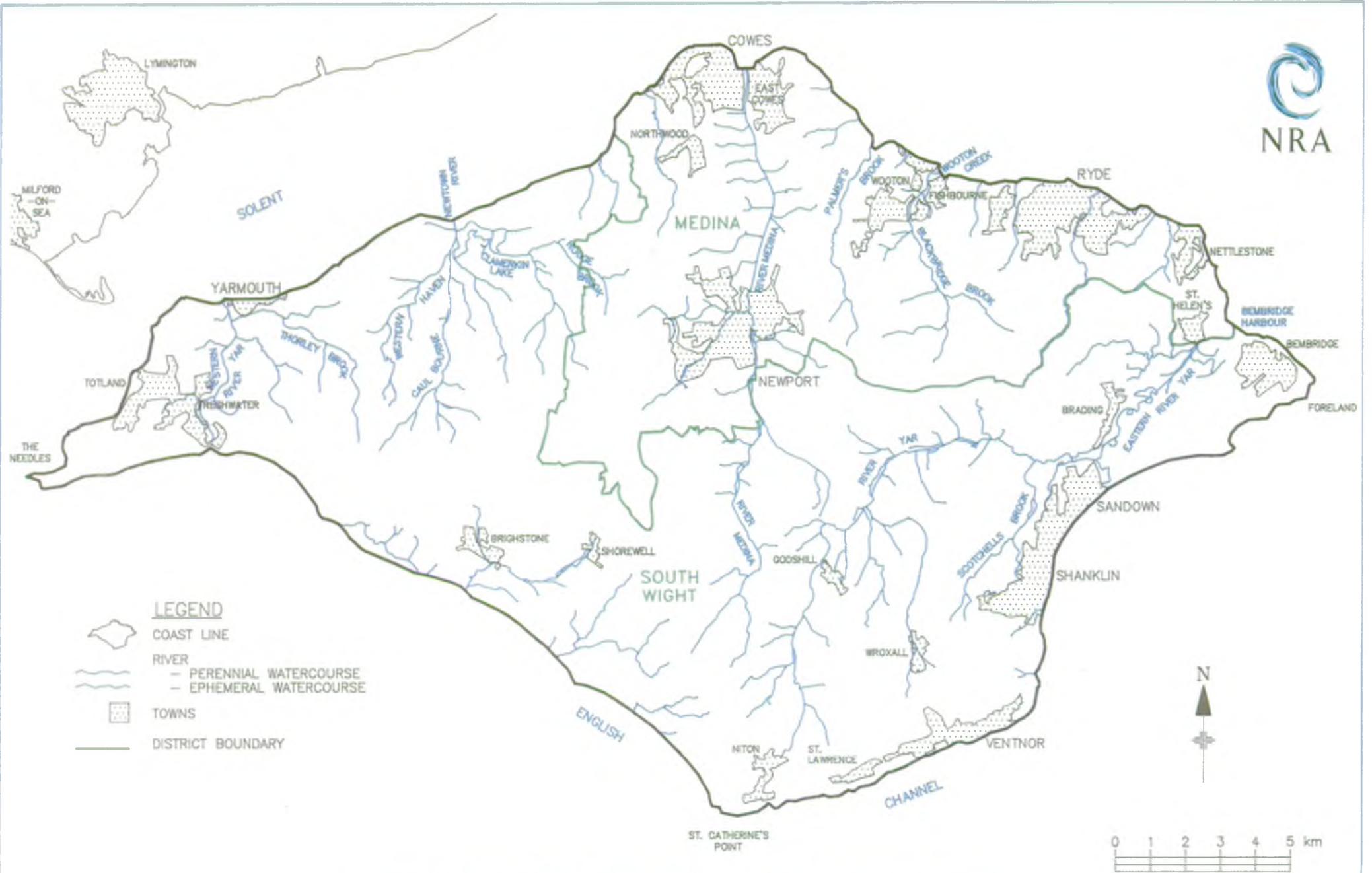


Actual groundwater levels 1989–1993. This can be compared to long term Max, Min and Mean values calculated from years 1980 to 1994.

HYDROMETRIC DATA

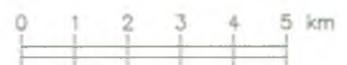


NRA



LEGEND

-  COAST LINE
-  RIVER
-  PERENNIAL WATERCOURSE
-  EPIHEMERAL WATERCOURSE
-  TOWNS
-  DISTRICT BOUNDARY



INTERACTIONS WITH PLANNING AUTHORITIES

A3 FUTURE DEVELOPMENT

A3.1.1 General

The National Rivers Authority (NRA) is consulted regularly on planning matters falling within its terms of reference, both in the preparation by Local Authorities of statutory plans and in connection with individual applications for planning consent. Recent guidance from the Department of the Environment has strengthened links with the NRA, but ultimate planning control remains with the Planning Authorities. Catchment Management Plans are complementary to the statutory Plans, by stating clearly the NRA's vision it is hoped that they will make a positive input to the formal planning process.

In taking decisions on development proposals, planning authorities are required to have regard to relevant Development Plans, the legislation specifically states that "...decisions are to be in accordance with the Plan, unless material considerations indicate otherwise". The framework required to meet this obligation in non-metropolitan areas entails the preparation of the following Plans:-

1. 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.

2. District or Local Plan.

This plan sets out detailed policies and specific proposals for the development and use of land, it should be in general conformity with the Structure Plan.

3. Minerals Local Plan.

The exploitation of minerals can impact upon a catchment in a number of ways, having significant effects on the river corridor and flood plain. Finished mineral workings can provide important conservation or amenity sites, but can also be a further cause of concern if they are used for solid waste disposal. The Minerals Locals Plan should cover these points in some detail, indicating areas where provision is made for mineral workings and the disposal of mineral wastes, as well as those where mineral resources are to be safeguarded for future working. The Plan should set out development control criteria and requirements for the restoration and aftercare of such sites.

4 Waste Local Plan.

Waste Regulation Authorities are required to licence disposal sites and ensure that they do not endanger public health, cause water pollution or seriously detract from local amenity. Operators must restore filled sites in accordance with the licence conditions and acquire a Certificate of Completion from the Waste Regulation Authority before being exonerated from legal responsibility for a site.

A Waste Regulation Authority may include its policies in the Minerals Local Plan, or prepare a separate Waste Local Plan which should identify suitable locations for the provision of further facilities and examine the land use implications of waste disposal.

Isle of Wight Catchment Management Plan

Within the development plans outlined above provision should be made for the needs of the National Rivers Authority and of the utility companies responsible for water supply, sewerage, electricity, gas and telecommunications. Local Authorities are required to consult a number of bodies, including the NRA, to resolve non-contentious points and minimise objections before a Plan is put on deposit.

A3.1.2 Protection of Groundwater

Most development is subject to consultation with the NRA who use the opportunity to protect the interests for which the Authority is responsible. One of the main concerns is the protection of groundwater, and NRA policy in this respect is set out in "Policy and Practice for the Protection of Groundwater. NRA.1992". Application of this policy depends on the circumstances of each case, but the document gives guidance based on the following key points:-

- 1) The measures needed to protect groundwater depend on the following factors:-
 - * Nature of the soil cover: soils with high, intermediate or low leaching potential. High leaching potential soils are sub-divided according to the physical processes controlling the movement of water through them.
 - * Presence and nature of any drift cover.
 - * Properties of the bed-rock as a major aquifer, minor aquifer or non-aquifer.
 - * Depth to water table.
- 2) The policy defines three zones of protection around each groundwater supply source:-
 - Zone One Within the 50 day groundwater travel-time horizon to the supply source.
 - Zone Two Between 50 and 400 days groundwater travel-time to the supply source.
 - Zone Three The total catchment zone for the source - ie. all groundwater which will eventually drain to the source.

A3.2 Local Perspective

Strategic planning on the Isle of Wight is provided by the Isle of Wight County Council Structure Plan which was approved by the Secretary of State for the Environment in May 1988 and covers the period to 1996. This document is currently being updated as a new-style Island-wide Local Plan. The Isle of Wight became a unitary authority on 1 April 1995 the Structure Plan and Local Plans will be replaced by a Unitary Development Plan.

Isle of Wight Catchment Management Plan

A3.2.1 Housing and Employment

Strategic Planning is provided by the Isle of Wight Structure Plan, which is currently under review. The new Draft Structure Plan was released in October 1993 and is scheduled for adoption in January 1995. The new plan will lay down key guidelines for development to the year 2011.

The estimated assumed maximum population growth over the period 1991 to 2011, of 900 persons per annum for the island, translates into a housing requirement of 9000 new housing units up to 2011 which exceeds the Regional Guidance figure issued by the government.

There are currently over 40 hectares of industrial land allocated by a local plan or with planning approval, with no real planning or physical restraint on development. In addition, major sites are currently being developed at Golden Hill Park and at Great Preston Road, with assistance from the Rural Development Commission.

Between 1960 and 1992, the Isle of Wight saw the development of some 65 hectares of industrial land. This represented development at an average rate of 2 hectares per annum, much of which was the relocation of distribution centres and quasi-retail operations such as car sales showrooms, from other in-town locations.

The land currently available, together with the allocations proposed in the Draft Structure Plan totals over 60 hectares. There are approximately 100 people employed per hectare on industrial estates. At this rate, the available land could theoretically provide for up to 6000 new jobs.

Development of industrial land at the same rate as that of the past three decades would still see only two-thirds of the existing allocation utilised. In fact, this rate of development is considered unlikely without a significant change in the economic climate.

A3.2.2 Waste Disposal

With a shortage of environmentally acceptable landfill sites on the island, permission is normally granted only for landfilling domestic waste which cannot be economically recycled or dealt with by other means. The waste-derived-fuel plant, proposed in the existing Structure Plan, is now in operation and has reduced the quantity of waste going to landfill by a third. The feasibility is being examined of treating solid organic wastes in conjunction with sewage sludge.

The selection of land disposal sites is conditioned by the widespread existence of important aquifers and the fact that much of the Island is designated as an AONB. The current draft Structure Plan does not address the protection of groundwaters or pollution arising from waste disposal, it is important that these issues should be considered in future Structure Plans. NRA policy on this and other issues is set out in "Policy and Practice for the Protection of Groundwaters. NRA 1992"

A3.2.3 Minerals

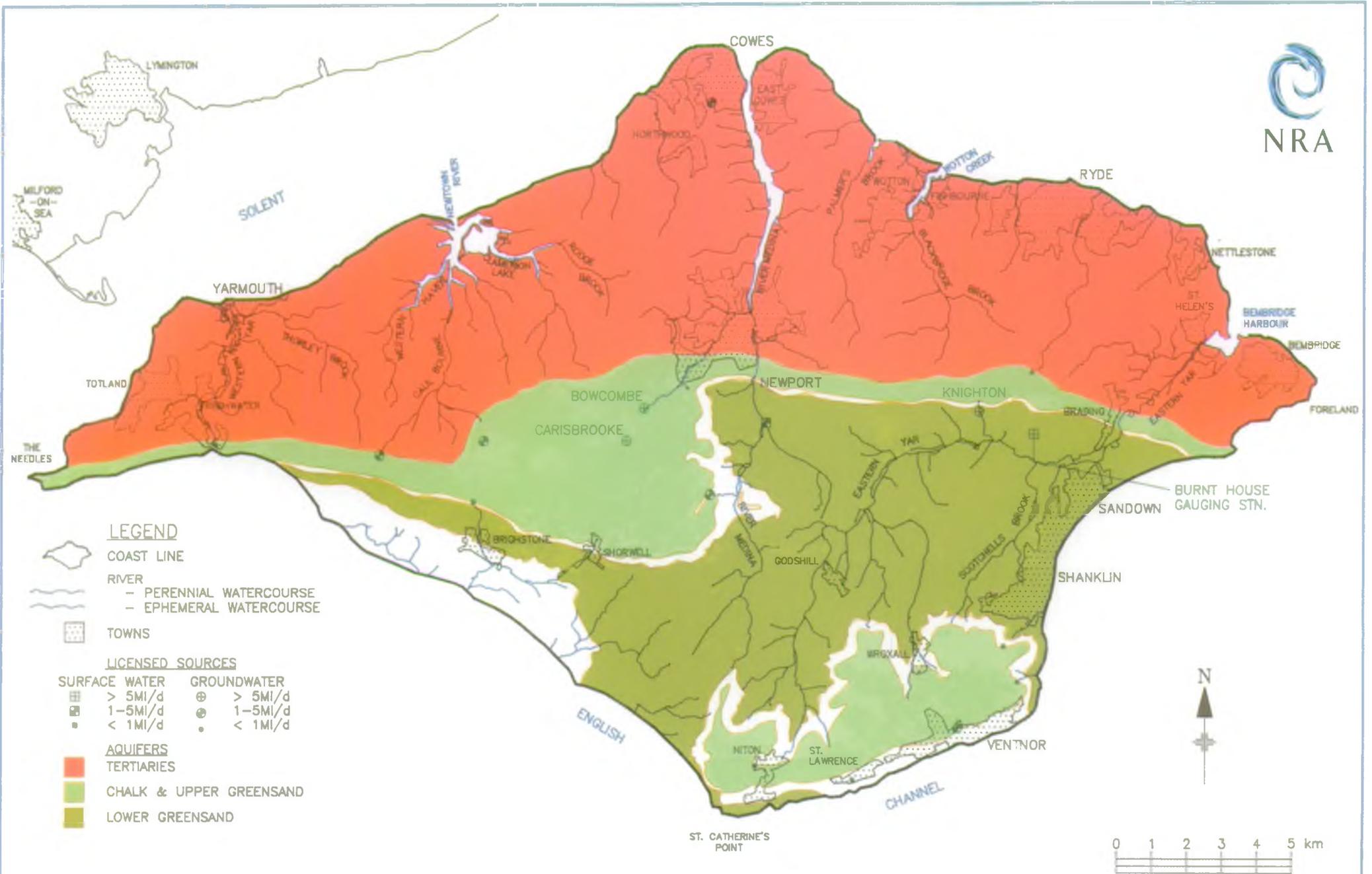
Physical separation from the mainland has created a self-contained market for minerals and aggregates extracted on the island. This situation is likely to continue, given the cost of transporting materials in bulk. In addition to imported materials, there are two main sources for mineral supply on the Island:

- (i) land-won minerals, including Chalk, building sand and aggregates.
- (ii) marine dredged aggregates - currently the main source of material for the building industry.

The majority of the Island's land-won minerals are found, and are worked, in designated areas of high landscape or conservation value (AONB, SSSI etc). The strong conflicts of interest between the need to supply raw materials and the need to protect the natural environment require a balanced strategy to protect both the countryside and coasts. The planning authority considers that sufficient reserves of land-won minerals are available within approved consents to meet market requirements to the year 2006, and operates a presumption against consenting new sources. Mineral extraction should not reduce aquifer capacity, interfere with groundwater flows or cause pollution, so the NRA is consulted before new workings are developed.

The Structure Plan includes policies relating to oil and gas exploitation, although there is no onshore activity on the island at present.

B1. PUBLIC WATER SUPPLY



PUBLIC WATER SUPPLY

SECTION B: USES

B1. PUBLIC WATER SUPPLY

B1.1 General

Abstractions are operated by Water Companies controlled by licences from the NRA, which stipulate maximum allowable annual, daily and hourly volumes. The mean licensed abstraction is the average daily abstraction allowable under the annual licence. Private groundwater supplies for domestic use are also included here, although these are generally very small and not significant from the resources standpoint.

Water supply sources in use before 1966 were granted Licences of Right under the Water Resources Act (1963). Since then, new sources have been licensed on the basis that abstraction neither adversely affects existing sources nor impairs the natural environment. Licences issued after 1966 may carry conditions such as Prescribed Flows or water levels, requiring abstraction to cease once the river falls below the prescribed value. In practice, the NRA increases the Prescribed Flows (PFs) controlling new abstractions in steps as more licences are granted, so as to protect both the Minimum Residual Flow (MRF) of the river and the rights of existing licence holders (MRFs are set to protect flows for other uses). PFs are set to control abstractions, neither MRFs nor PFs can guarantee river flows against natural droughts.

Compensation flows may also be included in licence conditions, requiring the release of water from groundwater or reservoir sources to augment low river flows.

At times of extreme water shortage Water Companies may apply to the DoE for a Drought Order to relax abstraction licence conditions or the level of service they provide to their customers. This may allow, for example, the temporary reduction of Prescribed Flows, an increased abstraction rate, reduction in mains pressure or even periodic closure of the supply. The terms of a Drought Order usually require the Water Company to introduce demand reduction measures, such as hose-pipe bans, at the same time.

B1.2 Local Perspective

The Isle of Wight comprises Resource Area 36. Public water supply is the responsibility of Southern Water Services Ltd. who operate the water sources listed in Table B1.1, which includes data on the licensed maxima and the actual abstractions for 1993.

Abstraction for public water supply generally peaks in the summer months, due largely to the demand for garden watering and the seasonal influx of holiday makers. Water demand forecasts had envisaged that peak daily demands would be up to four times the average, and there was concern that the existing supply infrastructure would be unable to cope - in practice, this was found to be an over-pessimistic view. Following the 1976 drought the Island's distribution system was reinforced by the installation of a ring main connecting most of the Island's sources. The next step was to construct a trunk main under the Solent, allowing the Island to draw up to 9MI/day from the Testwood treatment works in Hampshire.

Selection of the Island as a study area for the feasibility and cost of water metering involved the metering of all properties. Whilst this encouraged the more frugal use of water by customers, the replacement of faulty connecting pipes coupled with measures to reduce mains leakage also contributed to a reduction in demand, especially during peak demand periods. The consequence, coupled with the failure of tourism to increase at the expected rate, is that current peak demand is around 40 MI/d, some 25% lower than

in the late 1980s.

B1.2.1 Surface Water Sources

Surface water accounts for a quarter of the total licensed resource, with the intake on the Eastern Yar at Burnt House representing over 20%, making it the largest source of any type on the island. The abstraction at Burnt House is subject to a minimum residual flow (MRF) condition in the river, which itself is augmented by the transfer of surface water from the River Medina and groundwater from boreholes in the Lower Greensand aquifer.

Burnt House intake is subject to occasional closure due to high concentrations of agricultural pesticide in the river water following exceptionally heavy rainfall. The NRA is working with local farmers to improve the control over use and application of pesticides, but the catchment remains vulnerable to this problem.

B1.1.2 Groundwater Sources

Groundwater accounts for over 70 % of the licensed public supply on the island. Most of these sources are in the Chalk aquifers of the central ridge or the southern Chalk block and are licensed to provide between 1Ml/d and 15Ml/d. Minor supplies are taken from the Lower Greensand aquifer and there is a groundwater source in the Tertiary strata near Cowes, in the north of the island. There are large groundwater sources in the Godshill area which are used to support flows in the Eastern Yar at times of drought, enabling the public water supply abstraction at Burnt House to continue when natural river flows fall below the MRF.

B1.3 General Requirements for Managing Public Water Supply Abstraction

- Maximum availability of resources within the terms specified in the licence.
- Protection of existing public water supply abstractions
- Surface source quality. Within the limiting values defined for D2 Category Treatment (EC Council Directive 75/440/EEC) as set out in the Surface Water (Classification) Regulations 1989.
- Groundwater source quality. The NRA document, "Policy and Practice for the Protection of Groundwater 1992", will apply.

Isle of Wight Catchment Management Plan

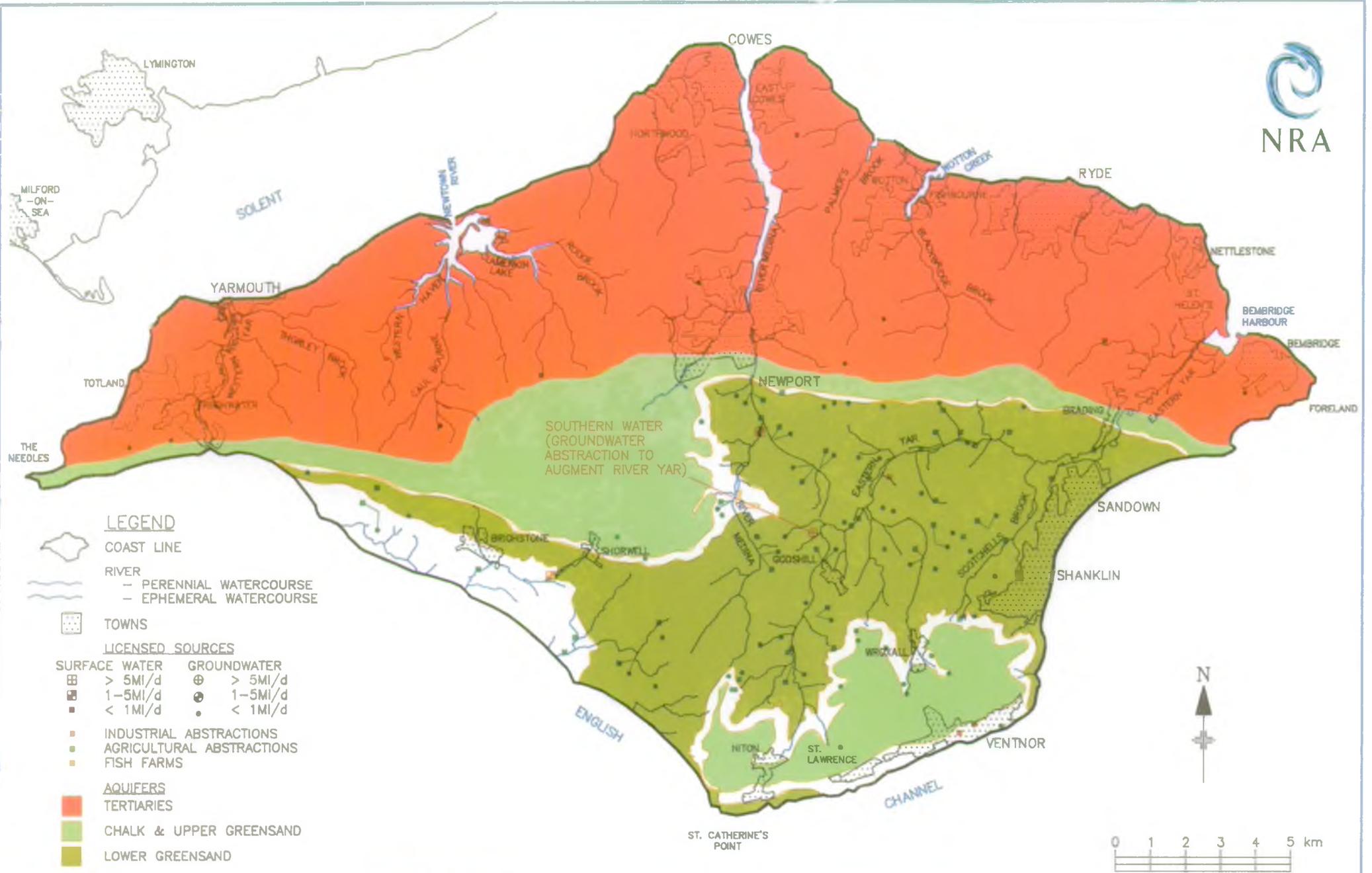
Table B1.1 Mean Licensed and Actual Abstraction for Public Water Supply

Location	Conditions (if any)	Licensed Abstraction (Ml/day)
Eastern Yar at Burnt House	Minimum Residual Flow of 1 Ml/day on the River Yar	18.00
Total Licensed Daily Abstraction (Surface Water)		18.00
Actual Daily Abstraction 1993 (Surface Water)		8.67
Niton		0.43
Knighton		13.15
Ashey		0.70
Chillerton	Minimum Residual Flow of 0.43 Ml/day on the Sheat Stream	5.40
Broadfields		1.10
Bowcombe	Abstraction is to cease if there is no flow in the Lukely Brook	13.50
Carisbrooke		22.37
Calbourne	Minimum Residual Flow of 0.34Ml/day on Caul Bourne	3.0
Shalcombe		2.06
Freshwater		0.70
Brighstone		0.90
Ventnor		3.80
Greatwood (Shanklin)		0.33
St Lawrence		0.77
Luccombe (Shanklin)		0.14
Total Licensed Daily Abstraction (Groundwater)		68.33
Actual Daily Abstraction 1993 (Groundwater)		20.98

B2. WATER SUPPLY FOR INDUSTRY AND AGRICULTURE



NRA



INDUSTRIAL & AGRICULTURAL ABSTRACTION

B2. WATER SUPPLY FOR INDUSTRY AND AGRICULTURE

B2.1 General

This section 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 Isle of Wight is predominantly rural and most licences under this category relate to relatively small abstractions for spray irrigation and general use. Although most of the individual licences are small, cumulatively they are a significant demand on the island's resources. This is due mainly to the intensive nature of the farming on the island, particularly in the Eastern Yar catchment. Control is achieved by linking abstractions to Minimum Residual Flow (MRF) settings or to water levels in the streams or rivers from which the water is taken, or which may be affected by groundwater abstraction.

The upper Yar valley is the most intensively farmed area of the island and has the greatest requirement for water for irrigation. Additional water is not available from the river during the summer; any new licences granted by the NRA stipulate that abstraction may take place only in the winter high flow period, with storage on site for summer use. The licence conditions in this area are under review to allow greater flexibility within the overall limit of abstraction.

The Island's resources support five minor industrial abstraction licences which include a small brewery, a mineral/spring water bottling plant, and a licence for gravel washing and cement production. Southern Water Services Ltd also produce bottled water on the Island, using a source licensed for public supply. There are three licensed abstractions for fish farming.

The mean daily licensed abstraction for industry and agriculture is listed in Table B2.1, together with the percentage of this total actually abstracted in a recent year (1993). The low take of water for agriculture in 1993 (around 10% of the licensed total) reflects the high summer rainfall in that year, which reduced demand for irrigation.

B2.3 General Requirements for the Supply of Water to Industry etc

- Abstraction should not cause environmental damage. New agricultural licences may specify prescribed MRFs, winter abstraction and storage of water for summer use.
- Water quality guidelines for agricultural irrigation have been published by ADAS, the agricultural advisory service of MAFF.

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- ADAS Central Veterinary Laboratory has published guidelines for the quality of water to be used by livestock.
- The Food and Agricultural Organisation of the United Nations (FAO) classifies water with moderate salinity (0.7 - 3.0ds/m) or chloride concentrations (140 - 350mg/l Cl-) as having restricted use for irrigation. NRA guidelines recommend that irrigation water should contain no more than 100mg/l to 500mg/l Cl- depending on the tolerance of the crop.

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

Use	Mean Licensed Abstraction (Ml/day)		Mean Actual Abstraction 1993 (Ml/day)	
	Surface	Groundwater	Surface	Groundwater
Agriculture	7.92	1.09	0.92	0.71
Industrial	0.22	0.52	0.0	0.26
Total	8.14	1.61	0.92	0.97

B.3 USE OF THE WATER RESOURCE

B3.1 General

The available water resource is defined as the annual effective rainfall which may be available as surface water or groundwater. Mean-year and 1:10 year drought annual resource figures have been assessed and compared with both the total annual licensed abstraction and the estimated actual abstraction for a typical year (1990). NRA policy is not to licence all of the available resource for abstraction, but to reserve a proportion for the protection of environmental and conservation interests.

In some cases abstracted water is returned directly to the river with minimal losses (eg cooling waters and gravel washing). Some of the water abstracted to supply customers within a catchment may be returned to the river via effluent discharges, and this can make a significant contribution to the maintenance of river flows.

The difference in volume between the water abstracted from a catchment and that returned constitutes the "consumptive use". The theoretical figure has been assessed for each resource area by subtracting the total consented discharge from the total licensed abstraction. Actual consumptive use has been assessed using actual abstraction and discharge data for a typical year, in this case 1990.

B3.2 Local Perspective

The Isle of Wight is considered as a single resource area by the NRA. The water balance indicates that around 21% of the water resource available in an average year is allocated for abstraction, rising to 37% in a 1 in 10 year drought. Much of this rainfall drains to the sea in winter and is only available if it recharges the aquifer or is stored in reservoirs.

Licensed abstraction for consumptive uses accounts for some 18% of the Island's mean available water resource, a level which would generally be considered acceptable: actual consumptive use in 1993 was estimated as being 9% of the mean annual resource, or 15% of that in a 1 in 10 year drought. However, catchments in the Isle of Wight are small and tend to have a flashy response to run off with low summer baseflow, and peak demands for water for both public supply and agricultural use are at their highest when flows are low, leading to competition for resources. With most sewage effluent being discharged to tidal waters and very little returned to rivers, any abstraction from Island sources can be considered to be essentially consumptive.

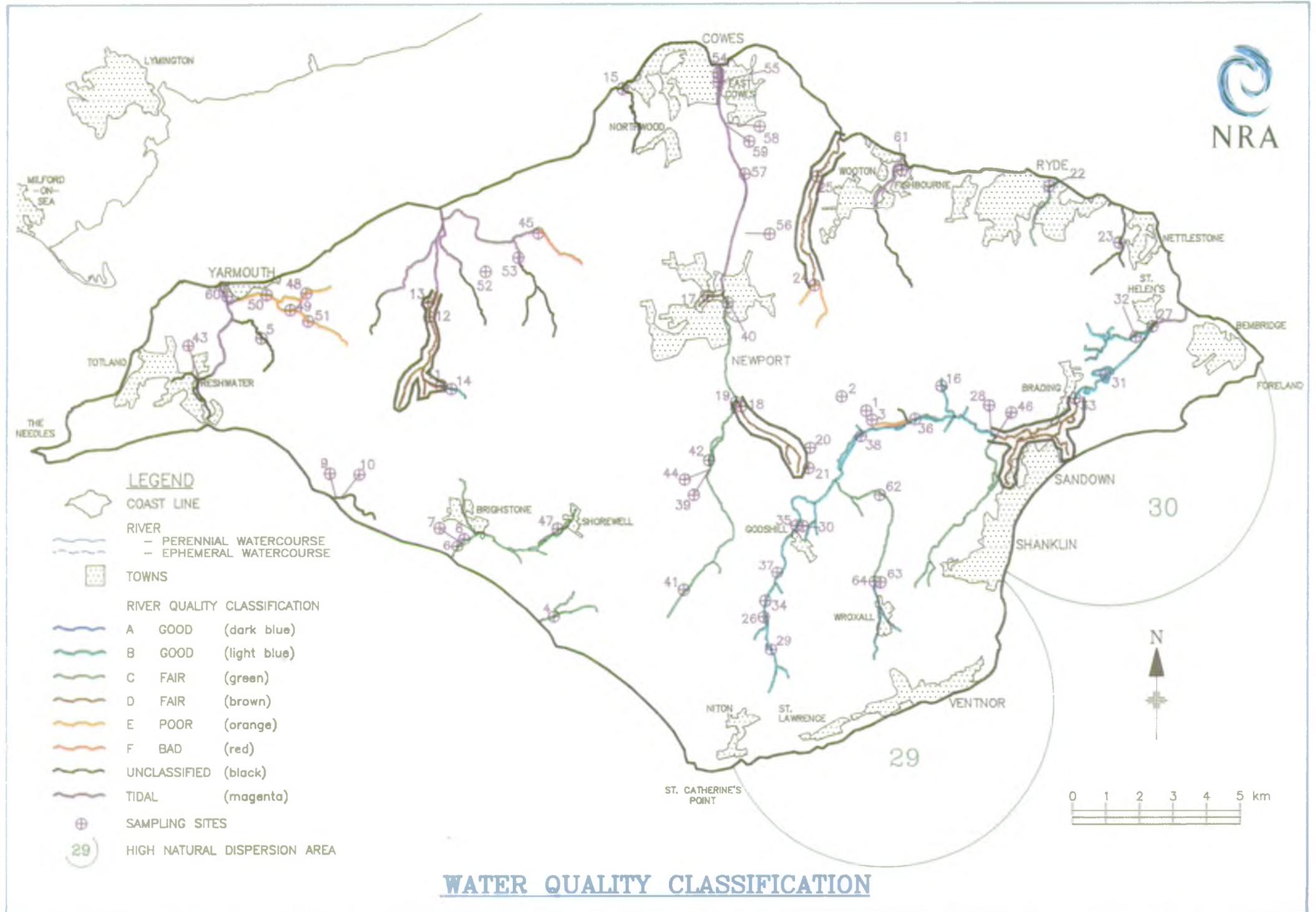
Water demand management measures have been widely adopted on the island, leakage reduction has been implemented and domestic metering introduced, with 95% of properties metered (although this policy is currently under review). Any future supply developments will need to account for seasonal water resource shortages - reservoir storage and river augmentation (from groundwater or from other surface catchments) are two possible options. Existing peak demands can be met using water transferred

from the mainland via the Solent trunk main; increased use of this facility and the provision of additional links are further options for meeting future peak demands.

B3.3 General Objectives for Water Resource Management

- To maintain and develop the hydrometric monitoring network.
- To ensure that future resource developments do not damage the river flow regime or ecology of the catchment.
- Where possible, to secure measures for the benefit of the catchment within new licence agreements.
- To encourage water consumers to adopt water saving measures.
- To encourage water companies to meet leakage targets and to manage demand.
- To encourage the use of winter abstraction and storage for spray irrigation.
- To encourage the linking of resources to optimise resource usage.
- Where possible, to return suitably treated effluent to the catchment for reuse.
- To consider the effects of possible climate change in long term water resource planning.

B4. WATER QUALITY



WATER QUALITY CLASSIFICATION

B4 WATER QUALITY

B4.1 General

The NRA uses two schemes for reporting river water quality and setting targets, General Quality Assessment (GQA) and Water Quality Objectives (WQO), which have replaced the National Water Council (NWC) classification.

The GQA scheme objectively classifies river water quality and is used to assess geographic and temporal trends. It comprises four components, each of which looks at a different aspect of river water quality:-

- * General Chemistry
- * Nutrients
- * Aesthetics
- * Biology

Currently, only the General Chemistry criteria have been defined.

The WQO scheme sets statutory water quality targets for controlled waters, designated by Notice by the Secretary of State for the Environment after consultation with the NRA and other interested parties. The scheme is based on the requirements of recognised river uses. The framework for implementation of the first element of these WQOs is described in "The Surface Water (River Ecosystem) (Classification) Regulations 1994". It permits the introduction of the River Ecosystem (RE) Classification which comprises five Classes in order of decreasing quality, RE1 to RE5, based on water chemistry. For each river reach a target RE Class will be set, to be achieved by a stated date (eg RE2 1998). Standards for other river uses are still being set.

Until the formal procedure is invoked by the Secretary of State the NRA will set informal River Quality Objectives (RQOs) by translating existing NWC targets to their WQO equivalents. These will define what is practicable and achievable within the short term (5 to 10 years) and can be considered as stepping stones to long term objectives set progressively as short term targets expire.

B4.2 Local Perspective

The water quality map shows existing water quality target designations within the Isle of Wight catchment. Compliance is assessed from the analysis of programmed routine water samples taken by the NRA from sites shown on the map and detailed in Table B4.1.

Thirteen of the Island's bathing beaches are designated under EC Directive (76/160/EEC). Sewage disposal schemes designed to ensure compliance with this Directive have been completed at Yarmouth, Gurnard, Cowes, Ryde and St Helens by Southern Water Services (or the predecessor Water Authority). Sewage disposal improvements at Bembridge and Ventnor, originally planned for completion during

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1995 as part of the UK Bathing Water Improvement Programme remain outstanding.

Table B4.1 - EU Designated Bathing Beaches

Gurnard	SZ 477959
Cowes West	SZ 488967
Bembridge	SZ 657881
Totland Bay	SZ 322871
Colwell Bay	SZ 328879
Ventnor	SZ 562773
Compton Bay	SZ 377841
Ryde East	SZ 601927
Seagrove	SZ 632912
St. Helens	SZ 637892
Sandown	SZ 601843
Shanklin	SZ 585811
Whitecliff Bay	SZ 641862

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B4.2 - Routine Surface Water Sampling Points

Map Ref No.	River/Stream	Sampling Point	Grid Ref.
1	Arreton Stream	Arreton - Hazeley Combe STW Arreton Street STW	SZ 5446 8604 SZ 5372 8646
2	Atherfield Stream	Heasley Manor	SZ 5463 8578
3	Barnfield Stream	Shepherds Chine	SZ 4510 7992
4	Brighstone Stream	Wilmington Military Road	SZ 3630 8820 SZ 4220 8207
5	Brook Stream	Brighstone STW Brighstone Mill	SZ 4230 8220 SZ 4240 8230
6	Caul Bourne	Brook Chine Septic Tank Brook Chine	SZ 3855 8353 SZ 3870 8350
7	Gurnard Luck	Fulling Mill	SZ 4170 8680
8	Knighton Trib	Shalfleet STW Shalfleet	SZ 4133 8881 SZ 4130 8920
9	Lukely Brook	Calbourne STW	SZ 4200 8670
10	Merstone Stream	Sluice Gate Knighton Waterworks STW	SZ 4712 9532 SZ 5670 8676
11	Merstone Stream - Ditch	Town Gate Blackwater STW	SZ 4970 8940 SZ 5071 8618
12	Monktonmead Brook	Blackwater	SZ 5055 8630
13	Nettlestone Stream	Merstone - Dovecotes STW	SZ 5278 8496
14	Palmers Brook	Merstone - Newlands STW	SZ 5274 8437
15	R. Eastern Yar	Simeon Street Wishing Well	SZ 5990 9253 SZ 6200 9090
16	River Medina	Staplers Heath Brocks Copse Road	SZ 5290 8970 SZ 5297 9282
17	Western Yar	Roud STW	SZ 5140 7990
18	River Medina	St Helens Screens	SZ 6300 8850
19	Rodge Brook	Burnt House - R. Eastern Yar	SZ 5820 8530
20	Scotchells Brook	Southford	SZ 5162 7891
21	Shorwell Stream	Godshill STW	SZ 5257 8266
22	Thorley Brook	Brading STW	SZ 6160 8710
23	Tidal Causeway Lake - Trib	St Helens STW Anglers P.H. (Brading)	SZ 6250 8820 SZ 6070 8640
		Roud	SZ 5145 8038
		Bow Bridge	SZ 5238 8268
		Langbridge	SZ 5592 8580
		Beacon Alley	SZ 5180 8120
		Horringford	SZ 5430 8530
		U/S Chillerton STW	SZ 4975 8430
		Shide Weir	SZ 5030 8920
		Chale STW	SZ 4900 8070
		Highwood Lane	SZ 4975 8460
		Afton Road, Freshwater	SZ 3446 8690
		Chillerton STW	SZ 4970 8430
		N.W. of Porchfield	SZ 4460 9120
		Burnt House - Scotchells Brook	SZ 5830 8525
		Shorwell STW	SZ 4520 8260
		Thorley - Hill Place STW	SZ 3764 8949
		Thorley - Tattels Lane STW	SZ 3716 8901
		Thorley Bridge	SZ 3645 8945
		Thorley - North View STW	SZ 3770 8869
		Newtown - Vicarage Lane STW	SZ 4302 9010

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Table B4.2 - Routine Surface Water Sampling Points cont.

Map Ref No.	River/Stream	Sampling Point	Grid Ref.
24	Tidal Clamerkin Lake	Newtown - Clamerkin STW	SZ 4400 9050
25	Tidal Eastern Yar	Tidal Eastern Yar	
26	Tidal Newtown River - Calbourne	Tidal Newtown River	
27	Tidal River Medina	Thetis Sewage Outfall- West Cowes	SZ 5000 9575
		Floating Bridge Slipway	SZ 5000 9550
		Fairlee STW - New Works	SZ 5083 9118
		Folly Inn	SZ 5080 9290
		Hall Aggregates (South Coast) Ltd,	SZ 5029 9425
		Kingston Wharf, East Cowes	
		East Cowes Power Station	SZ 5026 9434
28	Tidal Western Yar	Tidal Western Yar	SZ 3527 8941
29	Tidal Wootton Creek	Tidal Wootton Creek	SZ 5550 9300
30	Wroxall Stream	Bathingbourne	SZ 5487 8358
		Wroxall STW	SZ 5490 8090
		U/S Wroxall STW	SZ 5472 8092

B5. EFFLUENT DISPOSAL

B5. EFFLUENT DISPOSAL

B5.1 General

The volumetric and quality conditions to be met by a discharge are set out in a specific discharge consent calculated in relation to the quality objective of the receiving water. It follows that if there is any subsequent deterioration in upstream water quality or diminution of river flow below the values used in calculating the consent, then downstream uses could be put at risk.

B5.2 Local Perspective

The Isle of Wight is relatively sparsely populated; there are no major conurbations but the population is served by 23 sewage treatment works, the largest of which, Fairlee, is consented to discharge up to 12,115 m³/day to the Medina estuary. There are several small treatment works which discharge into rivers with very little dilution, in the upper catchments. Such discharges have the potential to impact heavily on water quality, but no significant problems are being caused at present.

The greater part of the effluent from sewage treatment works on the island is discharged to tidal waters. In the past this has caused significant water quality problems and failure to meet the mandatory EC bathing water standards. Recently, Southern Water Services Ltd. have invested in new treatment works and long sea outfalls, and have reduced the frequency of discharges from combined sewer overflows (CSOs). Upgrading of the sewerage system and the provision of long sea outfalls has concentrated in the Cowes and Ryde area, with over 40 small existing and overflows being replaced in the Cowes area alone. To the south of the Island, in the Sandown, Bembridge and Ventnor sub-catchments, studies are in hand to evaluate options for improved sewage disposal.

B5.3 General Requirements for the Management of Water Quality

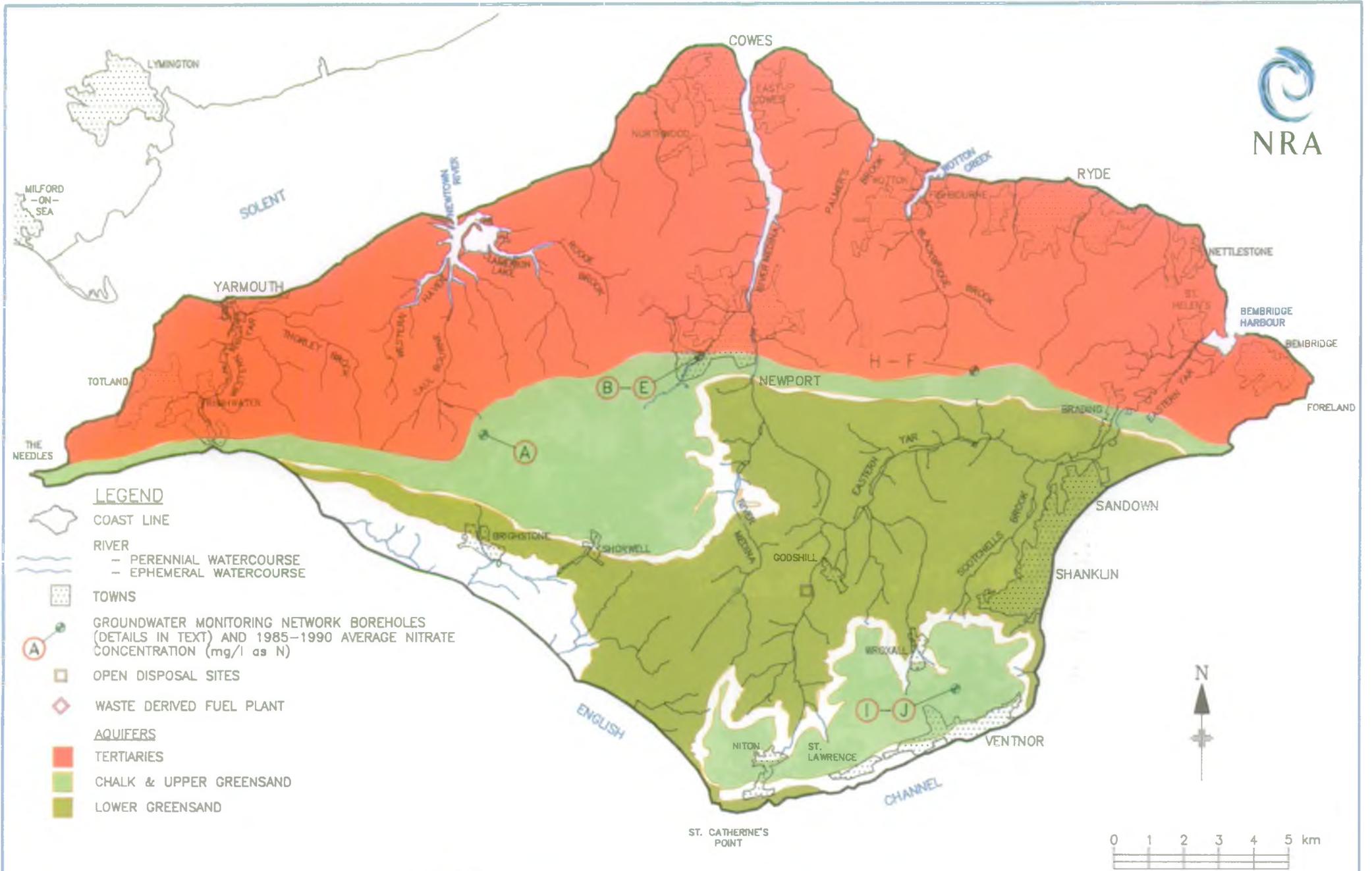
- River water quality objectives to be use-related.
- Monitoring of surface waters and effluent discharges to ensure compliance with consents.
- Outfalls to be sited so as to achieve good effluent mixing with the receiving water.
- No deterioration in upstream flow or water quality beyond the values used in setting the consent.

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Table B5.1 List of Major ($\geq 1000\text{m}^3/\text{day}$)
Consented Discharges

Name	Type	Consented Flow (M ³ /day)	Receiving Water
Fairlee	Public STW	12115	Medina Estuary
Ryde Sea Outfall	Long Sea Outfall	8000	East Solent
Sandown	Public STW	7000	English Channel
East Cowes	Public STW	5900	Solent
Cowes	Power Station	5000	Medina Estuary
Norton Outfall	Public STW	3960	West Solent
Woodvale Outfall	Public STW	3000	Solent
Collins Point Outfall	Long Sea Outfall	1350	English Channel
Flowers Brook Outfall	Long Sea Outfall	1200	English Channel
Bembridge	Long Sea Outfall	1078	English Channel

B6. INTERMITTENT AND DIFFUSE POLLUTION



LEGEND

- COAST LINE
- RIVER
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
- TOWNS
- GROUNDWATER MONITORING NETWORK BOREHOLES (DETAILS IN TEXT) AND 1985-1990 AVERAGE NITRATE CONCENTRATION (mg/l as N)
- OPEN DISPOSAL SITES
- WASTE DERIVED FUEL PLANT
- AQUIFERS**
- TERTIARIES
- CHALK & UPPER GREENSAND
- LOWER GREENSAND

INTERMITTENT & DIFFUSE POLLUTION

B6. INTERMITTENT AND DIFFUSE POLLUTION

B6.1 General

This section considers the wide range of pollution inputs to the catchment which are irregular or are not covered by formal discharge consents. These fall into three main categories:

- 1) Occasional unconsented discharges from point sources.

The main cause of intermittent pollution in rural catchments is accidental discharges of strong agricultural wastes, such as silage liquor or cattle slurry. Elsewhere, accidental pollution may result from traffic accidents, industrial spillages, or from plant failure at effluent treatment works. Problems are most acute in the summer months when river flows are low, and small streams are particularly at risk as they offer only limited dilution.

- 2) Intermittent consented point source discharges.

This category includes combined sewer overflows (CSOs) from public sewerage systems, which are required to prevent the network being overwhelmed at times of heavy rainfall. The aggregated discharge of CSOs can represent a significant pollutant load to a river, so care must be taken that control levels are correctly set to maximise the hydraulic capacity of the system, and to limit overflows to times of storm. Most CSO discharges are untreated and unconsented at present, particularly in rural areas, but they are increasingly coming within the control of the NRA. The initial pulse of storm sewage arriving at a STW is usually retained for treatment when the flow subsides, whereas the more dilute overflow from prolonged storms is discharged to the river.

The NRA shares with Her Majesty's Inspectorate of Pollution (HMIP) and the Waste Regulation Authorities the duty to control pollution from landfill sites and mining activities. However, many such sites pre-date the legislation and are subject to little control, and discharges from abandoned mines are exempt. Modern landfill engineering techniques will improve matters for the future, but problems from older sites may persist for many years after operations cease.

- 3) Diffuse inputs.

Agricultural activities frequently result in diffuse inputs to the water environment. The application of fertiliser, or ploughing fallow land, may cause groundwater nitrate levels to exceed the limit set by EC Directive (80/778/EC) for the quality of drinking water. The NRA is now responsible for the 1989 Farm Waste Regulations covering the storage of fuel and the management of slurry and silage; enforcement includes monitoring agricultural installations and the provision of advice on best practise for the control of pollution risks. In their general operations farmers are encouraged to follow the MAFF Code of Good Agricultural Practice for the Protection of Water, and free advice on pollution control is available from the NRA or the MAFF Agricultural Development Advisory Service (ADAS).

Pesticides (fungicides, herbicides, insecticides etc) are of concern, as their concentration in drinking water is also constrained by Directive 80/778/EEC. The MAC is 0.1 micrograms per litre for individual pesticides and 0.5 micrograms per litre for total pesticides. Non-agricultural uses (such as weed control on roadsides or railway lines) have been a significant source of herbicide contamination in the past, but are increasingly coming under control.

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B6.2 Local Perspective

The Isle of Wight is a predominantly rural catchment and the majority of pollution incidents relate to agriculture. There are five landfill sites on the Island:-

Nettlestone (NGR. SZ 622902) has been completed, restored and is now in private ownership;

Stag Lane (NGR. SZ 503918) has been stabilised and will be completed to its final level when Government funds are available;

Lynn Bottom (NGR. 535886), the Island's principal domestic waste disposal site, is situated at the head of the Palmers Brook. The site is being filled in phases, the first of which is complete, capped with an impermeable cover and fitted with gas extraction and leachate treatment plant. Discharges from the site have caused pollution problems in the past.

Bleak Down (NGR. SZ 512816), previously in private ownership, has caused problems in the past, but improvements have been required by the Waste Regulation Authority and the NRA.

Standen Heath is a new domestic waste landfill site adjacent to Lynn bottom. It will be operated in accordance with modern practice and is expected to provide ten years' capacity. There is also a waste derived fuel plant in operation in Newport, reducing the quantity of solid waste going to landfill by about a third.

Many properties on the island are not connected to the main sewerage network and where there are clay soils, soakaways do not function well. This may lead to pollution problems in the small watercourses, which have little natural flow in dry weather.

Groundwater nitrate levels are significantly below the MAC and guideline concentration required by EC Directive (91/676/EEC). Average values for 1985 - 1990 are shown on the map.

Pesticide concentrations are monitored at ten sites on the Island and results for the period 1990 - 1994 are given in table B6.1. For water intended for abstraction for public supply there is a MAC of 0.5 micrograms per litre (one part in two thousand million) of total pesticides and 0.1 microgram per litre for individual pesticides. Triazines (herbicide) and 'Drins (the Dieldrin group of insecticides and their derivatives) are the most commonly detected substances, but their concentration in the environment is falling as tighter controls are applied to their use.

Unacceptable levels of the agricultural herbicides Isoproturon and Chlorotoluron were recorded from the Eastern Yar in March 1994. Figures reported by Southern Water Services indicated a 50-100 fold exceedance of the Drinking Water Directive MAC, and the water supply intake at Burnt House was closed down. These substances are applied in winter and early spring; it was assumed that the incident was a severe example of pesticide leaching from the soil after crop spraying. By the end of April pollutant concentrations had fallen, and it was possible to reopen the abstraction by August.

The NRA has launched an initiative to reduce herbicide use, but most farmers already conform to the Code of Practice. The problems on the Island are largely a function of intensive land-use coupled with the need to use surface water for public supply and the lack of alternative water resources.

B6.3 General Requirements for the Control of Pollution

- Monitoring of surface and groundwater quality.
- Monitoring of high risk sites (eg. waste disposal sites and farms) to assess their impact on surface and groundwater quality.
- Implementation of the NRA National Groundwater Protection Policy.
- Public education to encourage the early reporting of pollution incidents to the NRA.
- The maintenance of emergency procedures to eliminate or mitigate the impact of accidental discharges.
- Compliance with EC Directives on the Discharge of Dangerous Substances, Abstraction for Water Supply and the protection of Fisheries or Shellfish.
- Maintenance of a basic flow regime to reduce the impact of pollution.
- Provision of an uncultivated bankside buffer strip to attenuate diffuse pollution from overland run-off.

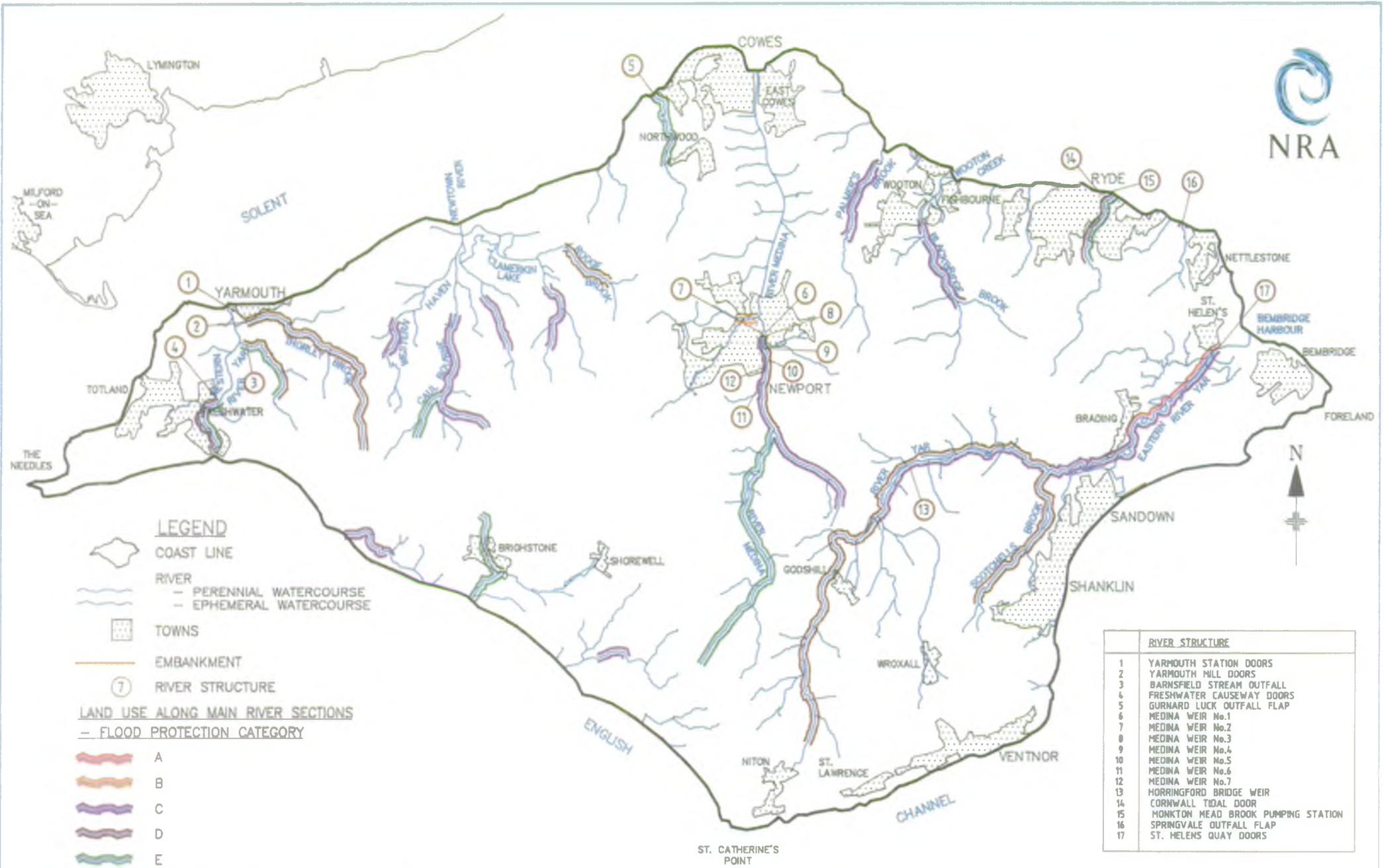
Table B6.1 Typical Groundwater Pesticide Concentrations at Monitoring sites (ng/l)

Map Ref	Source	'Drins	Triazines
A	Calbourne Borehole	ND	85
B	Carisbrooke Idlecombe	0.5	45
C	Carisbrooke Borehole 1	0.5	30
D	Carisbrooke Borehole 2	0.3	40
E	Carisbrooke Borehole3	0.5	75
F	Knighton Chalkwell	0.25	45
G	Knighton Farm	0.3	75
H	Knighton Old Mill	0.5	50
I	Ventnor Tunnel	0.5	40
J	Ventnor Well	ND	70

Note : ND = Not Detected

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B7. FLOOD DEFENCE AND LAND DRAINAGE



LEGEND

-  COAST LINE
-  RIVER
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
-  TOWNS
-  EMBANKMENT
-  RIVER STRUCTURE

LAND USE ALONG MAIN RIVER SECTIONS
- FLOOD PROTECTION CATEGORY

-  A
-  B
-  C
-  D
-  E

SEE TABLE B7.1 FOR LAND USE CATEGORIES

RIVER STRUCTURE	
1	YARMOUTH STATION DOORS
2	YARMOUTH HILL DOORS
3	BARNFIELD STREAM OUTFALL
4	FRESHWATER CAUSEWAY DOORS
5	GURNARD LUCK OUTFALL FLAP
6	MEDINA WEIR No.1
7	MEDINA WEIR No.2
8	MEDINA WEIR No.3
9	MEDINA WEIR No.4
10	MEDINA WEIR No.5
11	MEDINA WEIR No.6
12	MEDINA WEIR No.7
13	HORRINGFORD BRIDGE WEIR
14	CORNWALL TIDAL DOOR
15	HONKTON HEAD BROOK PUMPING STATION
16	SPRINGVALE OUTFALL FLAP
17	ST. HELENS QUAY DOORS



FLOOD DEFENCE AND LAND DRAINAGE

B7. FLOOD DEFENCE AND LAND DRAINAGE

B7.1 General

This function relates to the provision of effective defence for the natural and developed environment against flooding from rivers and the sea, and to the drainage of agricultural land within river valleys.

Flooding is a natural hazard resulting from extreme climatic conditions and the severity of a flood is described in terms of its statistical frequency over a long period of time. This is expressed as a return period, such as 1 in 50 years, and the effectiveness of flood defences is measured in the same terms, indicating the frequency with which they can be expected to be overtopped. Different land uses (housing, industry, agriculture etc) vary in their sensitivity to flooding, the NRA Standards of Service for flood defence are shown in Table B7.1.

LAND USE BAND	TARGET STANDARD OF PROTECTION (Return Period in Years)	
	FRESHWATER	SALINE
A. High density Urban Areas.	50-100	100-200
B. Medium density Urban (many include some agricultural)	25-100	50-200
C. Low population density; few properties at risk; highly productive agricultural land.	5-50	10-100
D. General arable farming, medium productivity, isolated properties.	1.25-10	2.5-20
E. Low population density; low productivity agriculture; grassland	<1.25	<1.5

(The MAFF Indicative Standards are only valid for capital works which are grant aided and they fall within the range used by NRA. Their intention is to be used in the decision rule laid out in the Project Appraisal Guidance Note as agreed with the Treasury).

B7.2 Local Perspective

The Isle of Wight, although exposed to the full force of storms and gales in the English Channel, is well protected from tidal flooding by its high coastline and cliffs. A total of 4.65 km of sea defences protect land below sea level, the most significant being Sandown Sea Wall which has a 600 year history. The NRA maintains 550 metres of the Sandown frontage between Fort Street and the Grand Hotel; adjacent

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coastal protection works are maintained by the Local Authority. These defences protect three hundred hectares of farmland and about 100 properties on the Brading and Sandown Levels, and prevent the sea breaking in to the river system. The wall was strengthened in 1978, when the associated timber groynes on the beach were repaired. The NRA also maintains defences against tidal flooding at Thorley Level, Yarmouth, Newtown, Gurnard, and adjacent to the sluices through which the Eastern Yar enters Bembridge harbour.

The NRA is the flood defence authority for 114 km of main river on the Island. In areas with sand and clay soils there is generally a rapid run off in response to rainfall, peak flows are high, but generally short lived. Land adjacent to the lower reaches of Island rivers may be subject to flooding, especially when the discharge to sea is tide-locked.

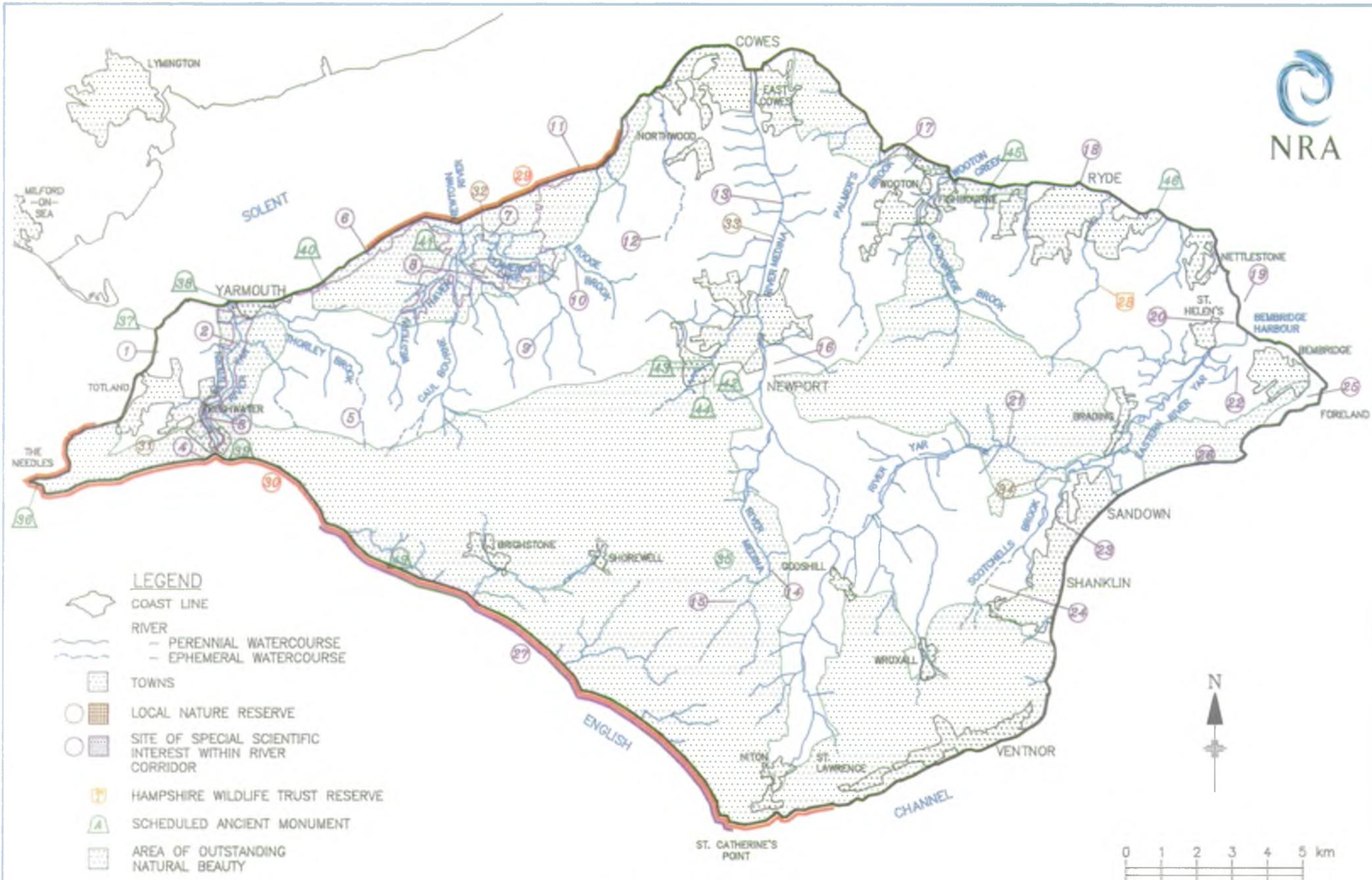
A flood alleviation scheme was undertaken on the Western Yar following flooding in August 1954. Similarly, severe flooding in 1960/1961 prompted a comprehensive flood relief scheme for the Lukely Brook and 4km of the River Medina. Other flood defence schemes have included improvements to Shalfleet Mill Stream, Thorley Brook and 20 km of the Eastern Yar. Two electric pumps at the Monktonmead Brook outfall supplement gravity drainage through the tidal flaps when high rainfall and adverse tides coincide. Both tidal and fluvial flooding continue as problems in some areas, the most recent event having followed heavy rainfall in December 1993.

The NRA's flood defence function includes the protection of land from flooding by the sea. This should not be confused with the power of Local Authorities to protect coastal land against erosion, but as the two processes are intimately related there is close cooperation between the agencies concerned. A recent Government initiative is a proposal for the development of integrated Shoreline Management Plans for flood defence, based on eleven natural "shoreline cells" in England and Wales. The Isle of Wight falls within Cell 5, which lies between Portland Bill in Dorset and Selsey Bill in Sussex.

B7.3 General Requirements for Flood Protection and Land Drainage

- Carry out flood defence works with sensitivity and in accordance with the NRA's environmental responsibilities.
- Design river channels to need the minimum of maintenance.
- Maintain river channels, control structures and embankments to ensure their continued effectiveness.
- Manage aquatic weed to maintain the appropriate flood defence standard.
- Manage bankside trees to prevent obstruction of the river channel.
- Maintain channel water levels and the water table in adjacent land at a level appropriate to land use.
- Resist development in the flood plain unless measures are taken to ensure that flood risk is not significantly increased.
- Maintain tidal defences to provide the design level of protection.

B8. LANDSCAPE AND CONSERVATION



LEGEND

- COAST LINE
- RIVER**
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
- TOWNS
- LOCAL NATURE RESERVE
- SITE OF SPECIAL SCIENTIFIC INTEREST WITHIN RIVER CORRIDOR
- HAMPSHIRE WILDLIFE TRUST RESERVE
- SCHEDULED ANCIENT MONUMENT
- AREA OF OUTSTANDING NATURAL BEAUTY
- HERITAGE COAST



CONSERVATION

B8. LANDSCAPE AND CONSERVATION

B8.1 General

This function relates to the protection of the flora, fauna and ecology of the river corridor and includes both organisms which depend on the river itself and those which exploit the river banks. A healthy river and adjacent corridor is characterised by diverse and abundant wildlife communities which enhance the overall quality of the landscape.

Rivers have been managed and used by man for thousands of years, shaping their character in relation to his use of the land. However, the pace of change is accelerating and recent measures such as realignment, the removal of bankside trees and wetland drainage have significantly altered this environment.

The NRA's conservation duties are set in Sections 16 and 17 of the Water Resources Act 1991, and require the Authority, whilst carrying out its own functions or exercising its regulatory powers, to further the conservation of flora, fauna, geological and physical features of special interest, and the enhancement of natural beauty. Consideration must also be given to impacts on the man-made environment including buildings, sites and objects of architectural or historic interest.

Many statutory and voluntary bodies have conservation roles and responsibilities; these include English Nature, the Countryside Commission, English Heritage, County Councils, Local planning authorities, the National Trust, County Wildlife Trusts and the Royal Society for the Protection of Birds (RSPB)

B8.2 Local Perspective

The rivers of the Isle of Wight are small and have been heavily engineered for land drainage and flood defence. Many river channels lack natural features such as pool-riffle sequences or meanders, their over-deepened channels lack marginal wetland vegetation and they provide poor wildlife habitats. Elsewhere, less-engineered reaches demonstrate that the Island's rivers have the potential to support a diverse aquatic flora and fauna.

The Island's wetlands include reed beds, grazing marsh and carr woodland, which provide important habitats for wildlife and include Sites of Special Scientific Interest (SSSIs). The NRA has been directly involved in the management of Freshwater Marshes, a Local Nature Reserve.

Much of the Island is notified as an Area of Outstanding Natural Beauty (AONB) or an Area of Great Landscape Value. There are one hundred and twelve recognised conservation sites which include fifty nine Scheduled Ancient Monuments, although not all of these are related to the water environment. Following designation of an Environmentally Sensitive Area by MAFF, a water level management plan is being prepared for the Eastern Yar by the NRA, working in conjunction with English Nature, the Countryside Commission and the County Council.

B8.3 General Requirements for Conservation and Landscape Management

- Determine the conservation value and requirements of river reaches.
- Waters should comply with the minimum quality standards for amenity protection and aesthetic criteria, and with EC Directive 76/464/EEC on the control of Dangerous Substances.
- A variable flow regime is required to conserve the natural characteristics of the river, with monthly averages reflecting the natural flow pattern.
- Seasonal spate flows are desirable to inundate wetlands and to remove accumulated silt from the river channel.
- An uncultivated margin is desirable to act as a buffer strip between the river and farmland and as a "green corridor" in the landscape. Encourage the application of land-use grant schemes to this end and to enhance wetlands.
- Encourage biodiversity by maintaining natural river features such as meanders, pools, rapids, river cliffs and marginal wetlands. Channels should be of a size appropriate to the flow regime.
- Operate control structures to maintain channel water levels and protect adjacent wetland habitats from excessive drying.
- Encourage autumn weedcutting to maintain channel capacity for winter flows whilst minimising loss of vegetation by scouring.
- Manage access to the river by livestock to control excessive trampling of the banks. Control access by the public to avoid excessive disturbance or ecological damage.
- Protect sites of archaeological or historic interest from damage. The importance of Local Authority Sites and Monuments Records should be recognised.
- Co-operate with local authorities and riparian landowners to ensure that banks and surrounding areas are free from rubbish and litter.

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Table B8.1 Schedule of Designated Sites

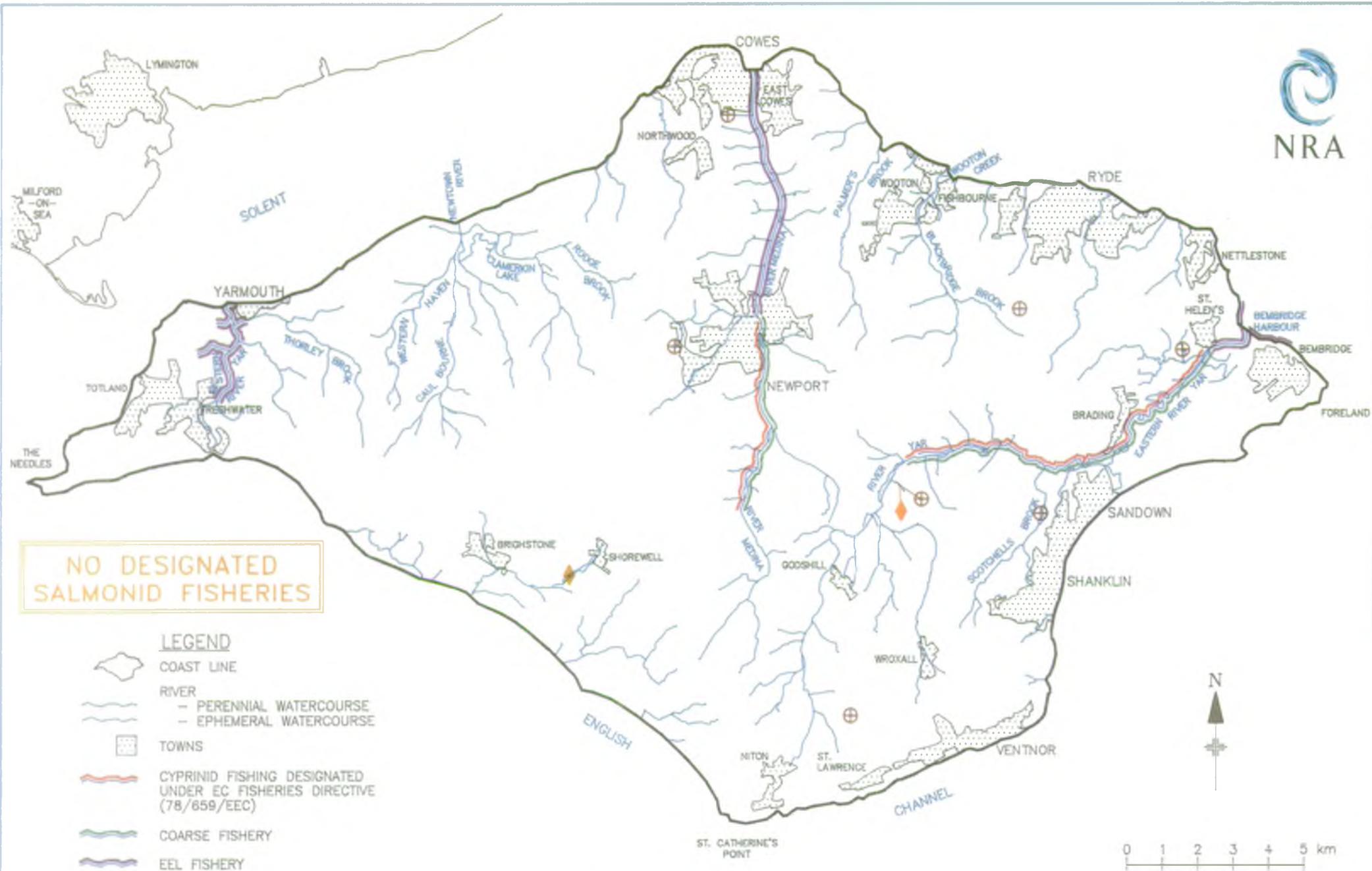
Map Ref No	Name	Designation
1	Colwell Bay	SSSI
2	Yar Estuary	SSSI
3	Freshwater Marshes	SSSI
4	Watcombe Bay	SSSI
5	Prospect Quarry	SSSI
6	Bouldner & Hampstead Cliffs	SSSI
7	Newtown Harbour	SSSI
8	Hart's Farm Meadows	SSSI
9	North Park Copse	SSSI
10	Lock's Farm Meadow	SSSI
11	Gurnard Ledge to Saltmead Ledge	SSSI
12	Parkhurst Forest	SSSI
13	Medina Estuary	SSSI
14	The Wilderness	SSSI
15	Cridmore Bog	SSSI
16	Shide Quarry	SSSI
17	Kings Quarry Shore	SSSI
18	Ryde Sands	SSSI
19	St Helen's Ledges	SSSI
20	St Helen's Duver	SSSI
21	Alverstone Marshes	SSSI
22	Brading Marshes	SSSI
23	Lake Allotments	SSSI
24	America Wood	SSSI
25	Whitecliff Bay & Bembridge Ledges	SSSI
26	Bembridge Down	SSSI
27	Hanover Point to St Catherines Point	SSSI
28	Swanpond Copse	RSNC
29	Hamstead Heritage Coast	HC
30	Tennyson Heritage Coast	HC
31	Freshwater Marshes	LNR
32	Newtown LNR	LNR
33	Werrar Marshes	LNR
34	Benstead's Marsh Nature Reserve	LNR(FOE)
35	Isle of Wight AONB	AONB
36	Lower Needles Point Battery	SAM
37	Fort Albert	SAM
38	Yarmouth Castle	SAM
39	Group of Barrows - Afton Down	SAM
40	Bouldner Battery	SAM
41	Old Town Hall - Newtown	SAM
42	Roman Villa - Newport	SAM
43	Roman Villa - Carisbrooke	SAM
44	Carisbrooke Castle	SAM
45	Quarr Abbey - Ryde	SAM
46	Puckpool Mortar Battery - Ryde	SAM
47	No Man's Land Fort - Ryde	SAM
48	St Helen's Fort	SAM
49	Round Barrow - Sud Moor	SAM

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B9. FISHERIES



NRA



NO DESIGNATED SALMONID FISHERIES

LEGEND

- COAST LINE
- RIVER
 - PERENNIAL WATERCOURSE
 - EPHEMERAL WATERCOURSE
- TOWNS
- CYPRINID FISHING DESIGNATED UNDER EC FISHERIES DIRECTIVE (78/859/EEC)
- COARSE FISHERY
- EEL FISHERY
- TROUT LAKE
- ESTABLISHED STILLWATER FISHERY



FISHERIES

B9. FISHERIES

B9.1 General

This use relates to the maintenance of sustainable populations of indigenous freshwater fish. The distribution of fish is influenced by geographical parameters, principally bed gradient, river flow and the quality of the water. As a result, fisheries status is an important indicator of the overall health of a river. EU Freshwater Fisheries Directive (78/659/EEC) specifies "Salmonid" and "Cyprinid" water quality criteria to protect freshwater fish. Waters subject to the Directive are designated by member States, and whilst additional reaches may be designated, or existing reaches upgraded, designation cannot be withdrawn once it has been notified.

The law and local bylaws relating to salmon and freshwater fisheries are administered by the NRA. All freshwater anglers in England and Wales are required to be licensed under the Salmon and Freshwater Fisheries Act 1975.

B9.2 Local Perspective

B9.2.1 Coarse Fisheries

The small size of the rivers on the Isle of Wight limits their potential, but the Eastern Yar between Horringtonford and its mouth, and the Medina between Chillerton and Newport are designated as Cyprinid fisheries under the EC Freshwater Fisheries Directive (78/659/EEC). The predominant species of coarse fish are carp, roach and dace. Rudd, perch, bream and tench are found in smaller numbers, and minor streams are characterised by stone loach, bullhead and eels.

A number of small ponds, disused mineral workings and irrigation lagoons support populations of coarse fish. Mullet, flounders and bass are found in the estuaries, and eel fishing is carried out at Yarmouth, Cowes and Bembridge. The NRA licensing system for eel fishing is currently being revised and will be re-introduced in 1995.

B9.2.2 Game Fisheries

Although there are records of wild brown trout in the catchments of the Medina and Yar, with some larger trout in their lower reaches, a survey in February 1993 failed to find any in the areas fished by anglers. The status of salmon and sea-trout is unknown, although sea-trout are infrequent visitors to the Medina Estuary and the freshwater reaches of the Shide.

The one fish farm on the island provides trout for small stillwater fisheries. Other than these, there are no game fisheries on the Island.

B9.3 General Requirements for Fisheries Management

- Water quality in designated reaches to comply with EC Fisheries Directive (78/659/EEC).
- Maintain sufficient flow to conserve fish populations and allow fish movements within the catchment.

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- Provide and maintain fish passes at obstructions to ensure the free passage of fish. All barriers should be passable at low river flows.
- Maintain and develop diverse natural river features to ensure a variety of spawning and feeding areas.
- Maintain a variety of vegetation on the stream bank and in the channel to provide shade and cover.
- Where fish stocking is required, use appropriate species and numbers of fish.
- Maintain high quality spawning gravels in reaches where salmonid fish breed.
- Avoid rapid fluctuations in water levels where this may endanger fish.
- Ensure that fisheries management operations are consistent with conservation objectives.

B10. RECREATION AND AMENITY

B10. RECREATION AND AMENITY

B10.1 General

This section considers activities such as walking, canoeing, swimming, boating, fishing and bird watching, which attract people to the river corridor. The principal areas of concern are access, aesthetic acceptability and, in the case of immersion sports, the possible health risk. Also included here are commercial and recreational navigation.

The Recreation and Amenity functions of the NRA are set out in Section 8 of the Water Act 1989, which empowers the NRA to conserve and enhance the natural beauty and amenity of inland and coastal waters and associated land, and to encourage the use of such waters and land for recreation. The NRA must have regard to the preservation of public access, and may actively promote recreation and amenity where it is considered desirable.

In tidal waters there is usually a public right of navigation, but such rights do not exist elsewhere unless they have been established through historical usage, by dedication by riparian owners, or by statute. Navigation rights in freshwater are limited, there may be restrictions on the type of craft or the parts of rivers which can be used, and there is usually no right to land as the banks above tidal limits are privately owned.

B10.2 Local Perspective

The Solent is an international yachting centre, with extensive support industries (such as boatyards, equipment supply and moorings) based on Cowes, Bembridge Harbour, Wooton Creek and the Medina estuary. The Island has no inland navigable waterways.

The Isle of Wight is also a traditional-style holiday destination offering activities such as sea bathing, sea angling (there are only limited opportunities for freshwater angling) and informal countryside recreation. Attractions include Carisbrooke Castle, Queen Victoria's home at Osborne, a steam railway and the coloured sands of Alum Bay. There is a well developed network of footpaths, including waymarked trails which follow the coast and traverse the central Chalk ridge. The disused railway between Newport and Ventnor, part of which is owned by the NRA, has been developed as the Stenbury Trail footpath and cycle route.

In recent years the pattern of tourism has changed, with fewer resident holiday makers and more day visitors.

B10.3 General Requirements for Recreation and Amenity

- Waters to be aesthetically acceptable, free from surface films, floating litter, discolouration or unpleasant odours.
- Maintain a flow regime compatible with the requirements of recreation and amenity
- Maintain a network of footpaths and access points.
- Clearly signpost footpaths, access rights and recreational features.

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- Provide countryside interpretation information.
- Promote recreation so as to conform with the objectives of conservation.

SECTION C : TARGETS

RIVER FLOW TARGETS

Critical river flow requirements are identified from the needs of river USES and summarised in this section.

- The flow regime should reflect the natural pattern of seasonal flow variation to conserve the characteristics of the river.
- The natural flow regime should not be altered in a way which significantly inhibits the migration of fish.
- There should be no diminution of flows below those assumed in setting effluent discharge consents.
- Additional minimum residual flows should be set for reaches of the river as the basis for Prescribed Flows and to control future abstraction licences. In particular cases consideration may be given to varying existing licences by including a new prescribed flow control.

WATER QUALITY TARGETS

The following general water quality targets are considered to be appropriate for the catchment :-

- Individual reaches to meet their target River Quality Objective class.
- The conservation and amenity value of the river corridor to be maintained.
- The NRA Groundwater Protection Policy to be implemented
- The NRA water quality monitoring programme for the catchment to be maintained.
- Designation to be sought under the EC Freshwater Fisheries Directive for reaches where significant game or coarse fisheries occur.

RIVER TOPOGRAPHY TARGETS

Overall River Topography Targets for the catchment are derived from those for individual catchment uses, but may vary widely in scale. The intention here is to identify broad objectives rather than points of detail.

- Maintain river structures to ensure their continued effectiveness in relation to the Flood Defence Target Levels of Protection shown in Table B7.1
- Ensure that river structures are passable to migratory fish at Q95 flows.
- Maintain river channels at a size appropriate to the flow regime.
- Where consistent with the requirements of effective flood defence, conserve natural river features such

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as bankside trees, emergent vegetation, meanders and pool and riffle sequences.

- Promote the development of a buffer strip of uncultivated bankside vegetation to enhance the conservation and landscape value of the river corridor, and to attenuate the effects of siltation, nutrient enrichment and pollution resulting from run-off from adjacent land.
- Prevent excessive trampling of the river bank by livestock.
- Control new development, especially within the flood plain, to prevent significantly increased flood risk.
- Ensure that river maintenance work and new developments are compatible with the conservation duties of the NRA.
- Maintain the integrity of river banks and channels adjacent to mineral extraction sites.
- Restore waste disposal and mineral extraction sites to an acceptable environmental standard when operations are complete.
- Maintain access to the river for recreational users, consistent with the objectives of conservation.

RIVER MANAGEMENT TARGETS

River management targets are derived from those of individual uses and summarised in this section. The intention is not to provide a maintenance schedule but to indicate the major river management issues.

- Determine the ecological value of river reaches, and the management prescription needed for this to be conserved and enhanced.
- Ensure that environmental objectives are taken into account in river management programmes.
- Maintain channels and river banks to meet flood defence objectives in a way which encourages ecological diversity.
- Manage water levels to reduce flood risks, whilst maintaining fisheries and conserving wetland habitats.
- Maintain in-channel features to benefit wildlife conservation and fish stocks.
- Encourage Local Authorities, riparian owners and other interests to keep river banks and surrounding areas free from litter.
- Manage in-stream vegetation to control water levels, having regard to the needs of fisheries and nature conservation.
- Manage bankside trees to prevent obstruction of the watercourse.
- Operate sluices in a way which balances the needs of river users.

SECTION D : CATCHMENT ISSUES

1. It is impracticable to export solid wastes from the Island, but there is a lack of environmentally acceptable landfill sites. Lynn Bottom has a history of polluting Palmers Brook; a recent incident at the Bleak Down site caused severe pollution of the Eastern Yar. Future policy for waste disposal for the Island will be defined by the new Unitary Authority.
2. The Island is largely self-sufficient in minerals, but most mineral deposits are in areas of high conservation or landscape value, leading to a conflict of interest between economic and environmental needs.
3. The decision of SWS to base most domestic water charges on property values may erode the reduction in peak demand which followed the introduction of comprehensive domestic water metering on the Island.
5. The irrigation of crops, particularly in the Eastern Yar Catchment, makes significant demands on surface water resources during dry summer periods.
6. The largest public water supply on the island serves Sandown from the Eastern Yar at Burnt House. River flows can be augmented with water pumped from boreholes and from the River Medina, but the Yar remains vulnerable during drought periods.
7. As a result of intensive agriculture in the Eastern Yar catchment pesticides leach into watercourses at times of heavy rain, rendering the Burnt House source temporarily unfit for abstraction for public supply without recourse to costly advanced water treatment.
8. The Island's small streams offer little dilution to consented discharges or accidental spills and are vulnerable to pollution, especially as the land is intensively cultivated.
9. Some bathing beaches still fail the EU Bathing Water Directive, although heavy investment by Southern Water Services has greatly reduced the extent of this problem. Full compliance with the Directive should have been achieved by the end of 1995. However, the water services company's investment programme for bathing water improvements will not be completed by this date.
10. Many properties in rural areas are not connected to public sewers. Soakaway or septic tank systems do not always work well, particularly in clay soils, resulting in surface water pollution.
11. In the management of streams, a conflict of interest may arise between flood defence and wildlife conservation. There have been particular problems on the Eastern Yar, where the need to dredge a stream within an SSSI exposed conflicting legal obligations requiring resolution by the Courts.
12. There is a need for close control of development in flood risk areas, to avoid increasing the number and value of properties at risk and to prevent new development from reducing the flood capacity of river systems.
13. Fluvial flooding is experienced on the lower reaches of urban watercourses at Ryde, Newport, Seaview and Gurnard.
14. Tidal flooding is experienced in Cowes during exceptional tides.

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15. The ability to give warning of fluvial floods is impaired by the lack of accurate high-flow data from the poorly designed river flow gauging station at Shide and lack of adequate rainfall data.
16. Much of the land previously occupied by the track of the disused railway network is owned by the NRA, and needs to be managed to maximise its potential for recreation.
17. Rising sea levels and the effects of climate change must be taken into account in future planning.

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SECTION E : MANAGEMENT OPTIONS

The Management Options in this section represent the ideas of the NRA at the time this Consultation Report was prepared, but not constitute NRA policy as this will not be finalised until the public consultation process is complete.

Comments on these options and suggestions for new ideas are invited.

Management Options identify the agencies with an interest in the issue concerned, recognising that some functions are outside the specific responsibility of the NRA. The final choice of management action will involve many interests working together to fulfil the common strategy represented by the River Catchment Management Plan.

- Issue 1 The Island has limited capacity for the disposal of solid wastes. Future policy for waste disposal has yet to be decided.
- Consider alternative waste disposal strategies. [IoW County Council, NRA]
- Issue 2 The Island's essential mineral reserves are in environmentally sensitive areas.
- Decide priorities within the context of the Minerals Plan, consider increased import of aggregates from the mainland or from marine dredging. [IoW County Council]
- Issue 3 The peak demand for water exceeds the Island's dry-weather resources.
- Introduce measures to manage demand. [SWS, NRA]
- Make more use of the Testwood-IoW link to meet short-term needs. [SWS]
- Investigate options for further imports of water from the mainland. [SWS, NRA]
- Issue 4 The intention of SWS to link most domestic water charges to property values will lessen the usefulness of metering as a mechanism for demand management.
- Increase public awareness of the need to conserve water. [SWS, NRA]
- Issue 5 The irrigation of crops makes a significant demand on water resources during dry summer periods.
- Require new abstractions for consumptive uses to include storage to cover periods when the natural water resource is unable to meet their needs. [NRA, Abstractors]
- Make the most effective use of existing abstraction licences [Abstractors]
- Education in water conservation. [NRA]
-

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- Issue 6 Although the Eastern Yar can be augmented with water pumped from boreholes and from the River Medina, the river environment and Burnt House abstraction are vulnerable during drought periods.
- See Issue 3
- Issue 7 Pesticides leach into the Eastern Yar at times of heavy rainfall, rendering the Burnt House source unfit for abstraction for public supply.
- Encourage reduced use of pesticides and better control of their application by farmers. [NRA, SWS, Farmers]
- Provide advanced water treatment to remove pesticides. [SWS]
- Provide alternative sources of supply. [SWS]
- Issue 8 The Island's streams are vulnerable to pollution at times of low flow, when they offer little dilution for consented or accidental discharges.
- Educate the public, industry and the agricultural community to reduce the number of polluting accidents. [NRA]
- Increase surveillance, monitoring and the provision of advice on best practice. [NRA]
- Improve the performance of sewage treatment plant. [Private owners, SWS]
- Impose more stringent standards on effluent discharges. [NRA]
- Issue 9 Small sewage disposal systems relying on soakaways may cause surface water pollution where soils are impermeable.
- Extend the public sewerage system to serve small communities. [SWS]
- Install more effective sewage treatment systems for isolated properties. [Owners]
- Install sealed sewage disposal systems where soakaways cause problems, and remove contents by tanker for treatment elsewhere. [Owners]
- Increase surveillance and water quality monitoring in sensitive areas. [NRA]
- Issue 10 Some bathing beaches fail the EU Bathing Water Directive.
- Implement investment programme to complete outstanding commitments at Bembridge and Ventnor. [SWS]
- Consider interim means of ensuring compliance with Directive 76/160/EEC at Ventnor, Bembridge and Sandown bathing beaches.

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- Issue 11 A conflict of interest may arise in wetland management between the objectives of land drainage and wildlife conservation.
- Improve liaison between landowners and conservation interests. [NRA, Landowners, English Nature, Voluntary conservation bodies]
- Ensure that essential land drainage work causes minimum disruption and that opportunities for environmental enhancement are fully exploited. [NRA, Landowners]
- Issue 12 Minimise increased flood risks resulting from development.
- Enforce NRA Land Drainage and Sea Defence Byelaws. [NRA]
- Seek to control the impact of development in flood risk areas. [NRA, Local Authorities]
- Issue 13 Flooding from Rivers
- Implement recommendations of catchment studies when funds are available. [NRA]
- Intensify maintenance in critical locations. [NRA Landowners]
- Improve flood warning systems. [NRA]
- Issue 14 Tidal Flooding at Cowes
- Implement recommendations of catchment studies when funds are available. [NRA]
- Improve flood warning systems. [NRA]
- Issue 15 Flood Warning inadequate at Newport
- Replace Shide gauging station with improved facilities at a suitable point downstream. [NRA]
- Improve rain gauge / weather radar network.
- Issue 16 Management of disused railway land as a recreational resource
- Complete and implement a management plan. [NRA, Local Authorities]
- Issue 17. Rising sea levels and climate change may have adverse environmental effects.
- Take account of projected changes when planning for the future.[All]
-

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APPENDIX 1 : STATISTICS FOR THE ISLE OF WIGHT CATCHMENT

1. GENERAL INFORMATION

Catchment area 386.42

Topography

Maximum Level 263 m AOD
Minimum Level 0 m AOD

Geology

North - predominantly Tertiary deposits,
Central - Chalk and minor Greensand,
South - Wadhurst Clay and Ashdown Beds with minor Chalk and Greensand.

Estimated Catchment Population

Year	Population	Change per decade
1991	127,000	
2001	135,400	+6.6%

Districts and Estimated Population (1991)

District	Persons per Ha	Ha in catchment	% area of catchment	Population in catchment
Medina	6.1	11,700	30.2	73,000
South Wight	2.0	27,000	69.80	54,000
TOTAL	3.3	38.700	100.00	127,000

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

2. WATER RESOURCES

Resource Areas

	Number	Ha in catchment	% area of catchment
Isle of Wight	36	386.5	100

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Rainfall (mm)		1:10 yr Drought
	Mean Year	
Annual	850	662
Effective	361	203

Abstraction (m³/day)

Licensed Abstraction	153281
Actual Abstraction (1989)	26874
Actual as % of Licensed	18%

Licensed abstraction from groundwater	47431
Percentage from groundwater	37%

Percentage in High/Med Loss category	85%
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River Flow (cumecs):

		R Medina	Lukely Brook	E Yar
Mean Flow (Q50)	0.19	0.04	0.34	
95 percentile Flow (Q95)	0.08	0.01	0.13	

Water Supply Companies serving the catchment

	Area (Ha)	% Catchment
SWS IoW	386.5	100

3. WATER QUALITY

Length of River in each Quality Class (Km)

Class	Description	Target	Achieved 1990
1A	Good	0	20.3
1B	Good	51.5	38.1
2	Fair	36.0	16.5
3	Poor	0	12.6
4	Bad	0	0
	TOTAL	87.5	87.5

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Length Designated under the EC Freshwater Fisheries Directive (Km)

	Freshwater	Tidal
Cyprinid Designation	14.28	0
Salmonid Designation	0	0

Sewage Discharges

	Number	Consented (m ³ /day)
To rivers	20	3257
To estuary	5	12415
To sea	3	40416

4. FLOOD DEFENCE

Length of Main River (Km)	123.0	(includes tidal lengths)
Length of Coastline (Km)	127.5	
Schedule 4	94.0	
Main Tidal Waters	127.5	(included in Schedule 4)
Sea Defences (NRA)	0.5	
Sea Defences (LA)	1.44	
Tidal Banks (NRA)	1.0	

Internal Drainage Districts (Ha) None

5. CONSERVATION

Number of Designated Sites in the Catchment

Type	Total	Water Dependent
Ramsar Sites	0	0
NNRs	0	0
SSSIs	40	20
Environmentally Sensitive Areas	1	1

6. NAVIGATION

Length of inland navigation (km) 0

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APPENDIX 2. GLOSSARY OF TERMS AND UNITS

1:10 YEAR DROUGHT/FLOOD

A drought/flood event with a statistical probability of occurring once in a ten year period (other periods may be specified in a similar way).

ABSTRACTION LICENCE

Licence to abstract water from a surface or underground source. The maximum annual, daily and hourly abstraction rates are set by the licence.

ABSTRACTION - ACTUAL

Individual abstraction records are reported to the NRA each year but under the Water Resources Act 1991 these data are confidential. Actual abstraction figures reported in the Plan are area annual totals expressed in Ml/d.

AONB

Area of Outstanding Natural Beauty, notified by the Countryside Commission.

BOD

Biochemical Oxygen Demand. A measure of the polluting potential.

COARSE FISH

See FRESHWATER FISH, CYPRINIDS, SALMONIDS

CONSUMPTIVE USE

Water which is abstracted but not returned to the catchment, either because it evaporates (as in spray irrigation) or is exported for use in another catchment.

COUNTY STRUCTURE PLANS

Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.

CYPRINIDS

Fish of the carp family. (See also COARSE FISH, FRESHWATER FISH, SALMONIDS)

DISTRICT LOCAL PLANS

Statutory documents produced by District or Borough Councils to implement the development strategy set out in County Structure Plans. Specific land use allocations are identified.

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DROUGHT ORDER

Order issued by the Secretary of State for the Environment allowing the terms of abstraction licences to be varied and/or the levels of service to water company customers to be reduced at times when the resource is under stress.

EFFECTIVE RAINFALL

Total rainfall minus direct evaporation and the water used by plants for transpiration. This is equivalent to the total resource of a catchment.

EIFAC

The European Inland Fisheries Advisory Commission. An agency of the United Nations Food & Agriculture Organisation (FAO).

EMERGENT VEGETATION

Plants with roots in the river bed but which emerge from the water. Examples include reeds, iris and bullrush.

EPHEMERAL FLOW

River flow which dries at some times of the year (eg winterbournes).

FLOW MEASUREMENT UNITS

m ³ /s	Cubic metres per second
l/s	Litres per second
Ml/d	Megalitres per day. A megalitre is equivalent to a ten metre cube (approximates to a 4-bedroom detached house).
mgd	Millions of gallons per day

FLOW CONVERSION TABLE

<u>m³/s</u>	<u>Ml/d</u>	<u>mgd</u>
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

FRESHWATER FISH

For the purposes of the Salmon and Freshwater Fisheries Act 1975, fish other than Salmon, Brown Trout, Sea-Trout, Rainbow Trout and Char (see also COARSE FISH, FRESHWATER FISH, SALMONIDS).

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HECTARE

Unit of area 100m x 100m, equal to 2.471 acres.

HIGH SEAS RIGHTS

Common law rights of navigation and fisheries on tidal waters where no specific authority exists.

IDB

Internal Drainage Board. A local land drainage authority with powers to raise finance and do works.

IMPOUNDMENT RESERVOIR

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

ISOHYETALS

Contours of equal mean annual rainfall.

LOCAL NATURE RESERVE

A nature reserve designated by a Local Authority, frequently owned or managed by a voluntary conservation organisation.

mAOD

A measure of altitude. Metres above ordnance datum.

MARSH FEEDING

Supply of water from the river to marsh areas during the summer for wet fencing and abstraction (usually for spray irrigation).

MEAN LICENSED ABSTRACTION

In this Plan the mean licensed abstraction is the total annual abstraction permitted within the terms of a licence, expressed as an average daily volume in terms of megalitres per day (Ml/d).

MHWS

Mean High Water Spring Tides. A datum level used in mapping.

MINIMUM RESIDUAL FLOW (MRF)

The flow set at a river gauging station to protect downstream uses and below which controlled abstractions are required to cease. (see also **PRESCRIBED FLOW**)

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NATIONAL NATURE RESERVE

A nature reserve of national importance, designated and managed by English Nature.

NATURAL FLOW REGIME

The river flow pattern experienced prior to the influence of man, with no abstraction from or discharges to the catchment.

PERENNIAL FLOW

River flow present through the entire year. (See also EPHEMERAL FLOW)

POTABLE WATER SUPPLY

Water supplied for domestic use, including human consumption.

PRESCRIBED FLOW (PF)

A river flow incorporated as a condition in an abstraction licence, such that abstraction must cease once the flow falls below this value. Prescribed flows are set at or above the MRF (qv) which applies to the river where the abstraction takes place.

In many instances the PF applying to new licences is increased incrementally in step with the total licensed abstraction to protect the interest of existing abstractors: ie. newer abstractions have to cease at higher river flows. (see also MINIMUM RESIDUAL FLOW)

PRIMARY GAUGING STATION

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

PUMPED STORAGE RESERVOIR

Surface water storage area where the natural inflow is supplemented by water pumped from a separate source, typically a nearby river.

POOL:RIFFLE

A stretch of river with alternate sections of shallow fast-flowing water and deeper slow-moving pools.

Q95

River flow that is exceeded for 95 percent of the flow record (a low flow, the Q5 flow would be a high flow).

RAMSAR SITE

A wetland site of international significance for conservation, notified under international treaty.

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SALMONIDS

Fish classified by the Salmon and Freshwater Fisheries Act 1975 as belonging to the salmon family - Salmon, Brown Trout, Sea-Trout, Rainbow Trout and Char. (Summer-spawning salmonid species such as Grayling are classified by the Act as Freshwater Fish) (see also COARSE FISH, FRESHWATER FISH, CYPRINIDS).

SPATE FLOWS

Episodic fresh water flood flows.

SSSI

Site of Special Scientific Interest. A site designated by English Nature as being in need of protection to conserve its outstanding ecological or geological features. Land use and management operations within SSSIs are subject to control.

SNCI

Site of Nature Conservation Interest. A site of local importance for wildlife or geology, identified by the County Wildlife Trust or the County Council.

STW

Sewage Treatment Works.

TOTAL RAINFALL

Rainfall as measured by a rain gauge.

TOTAL RESOURCE

See EFFECTIVE RAINFALL

WET FENCING

Water-filled ditches used as field boundaries or to control the movement of livestock.

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APPENDIX 3 - FURTHER READING

EC Directives

- Quality of Surface Water for Abstraction as Drinking Water:
(75/440/EEC)
- Pollution Caused by the Discharge of Dangerous Substances:
(76/464/EEC)
- Quality of Fresh Waters for the Support of Fish Life:
(78/659/EEC)
- Protection of Groundwater Against Pollution:
(80/68/EEC)
- Quality of Drinking Water Intended for Human Consumption
(80/778/EEC)
- Urban Waste Water Treatment:
(91/271/EEC)
- Protection Against Pollution by Nitrates from Agriculture:
(91/676/EEC)

Acts of Parliament

- Salmon and Freshwater Fisheries Act 1975
- Wildlife and Countryside Act 1981
- Water Act 1989
- Environment Protection Act 1990
- Land Drainage Act 1991
- Water Resources Act 1991

NRA Publications

- NRA Corporate Plan (Annually)
- Water Resources Development Strategy: A Discussion Document. 1992
- Sustaining our Resources. Southern Region Water Resources Development Strategy: NRA Southern Region 1992
- Guidance Notes for Local Planning Authorities on the Methods of Protecting the Environment Through Development Plans. 1994

Other Publications

- Conservation and Land Drainage Guidelines: Water Space Amenity Commission 1980
- Nature Conservation and River Engineering: Nature Conservancy Council 1983
- Rivers and Wildlife Handbook: RSPB 1984
- Changing River Landscapes: Countryside Commission CCP238 1987
- Code of Practice on Conservation, Access and Recreation: MAFF, DoE & Welsh Office. HMSO 1989
- Nature Conservation and the Management of Drainage Channels: Nature Conservancy Council & Association of Drainage Authorities 1989
- Code of Practice for the Safe Use of Pesticides on Farms and Holdings: MAFF/HSC 1990
- Code of Good Agricultural Practice for the Protection of Water: MAFF PB 0587 1991
- Conservation Guidelines for Drainage Authorities: MAFF, DoE & Welsh Office. 1991
- Code of Good Agricultural Practice for the Protection of Air: MAFF PB 0618 1992
- Solving the Nitrate Problem: MAFF 1993

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