# local environment agency plan

## SOUTH ESSEX

### DRAFT LEAP

### DECEMBER 1999

Aug 2000


ENVIRONMENT AGENCY



ANGLIAN REGION

Kingfisher House, Goldhay Way,
Orton Goldhay,
Peterborough PE2 5ZR

ENVIRONMENT AGENCY

## Administrative Details

| | |
|---|---|
| **Local Planning Authorities:** | Essex County Council |
| | Basildon District Council |
| | Brentwood Borough Council |
| | Castle Point Borough Council |
| | Chelmsford Borough Council |
| | Maldon District Council |
| | Rochford District Council |
| **Unitary Authorities:** | Southend-on-Sea Council |
| | Thurrock Council |
| | London Borough of Havering |
| **National Parks:** | None |
| **Environment Agency:** | Anglian Region, Eastern Area |
| | Thames Region, (covering discharges to the Thames Estuary). |
| **Navigation Authorities:** | Port of London Authority |
| | Crouch Harbour Authority |
| **Flood Defence Committees:** | Essex Local Flood Defence Committee |
| **Internal Drainage Boards:** | None |

## Water Management

| | | |
|---|---|---|
| **Water Utilities:** | Anglian Water Services (AWS) | |
| | Essex and Suffolk Water (ESW) | |
| **Number of Water Supply Abstractions** | | |
| **Public Water Supply:** | Groundwater | 2 |
| | Surface water | 4 |
| **Agriculture** | Spray irrigation: | 11 ground water |
| | | 85 Surface water |
| | General | 34 |
| **Industry** | | 19 |
| **Fisheries** | | 11 |
| **Number of consents to discharge:** | | |
| **Sewage treatment works** | | 16 |
| **Industrial discharges** | | 25 |

## Integrated Pollution Control

| | |
|---|---|
| Integrated pollution control sites | 15 |

## Waste Management

| | |
|---|---|
| **Number of Licensed Waste Management Facilities** | 79 |

## Water Quality

Length (km) of River in General Quality Assessment classifications

| CHEMICAL | | BIOLOGICAL | |
|---|---|---|---|
| Class A | 0km | Class a | 0km |
| Class B | 1km | Class b | 3.5km |
| Class C | 37.5km | Class c | 25.0km |
| Class D | 26.5km | Class d | 39.5km |
| Class E | 18km | Class e | 9.0km |
| Unclassified | 0km | Unclassified | 0km |
| Total | 83km | Total | 77.0km |

Length (km) of Estuary in Coastal and Estuarine Working Party (CEWP) Grades

| | | | |
|---|---|---|---|
| Class A | 14.0km | Class C | 0.0km |
| Class B | 41.3km | Class D | 0.0km |

**Bathing Waters monitored at:**
Shoebury East, Thorpe Bay, Westcliff Bay

## Flood Defence

| | | |
|---|---|---|
| **Length of Designated Main River:** | Fluvial | 313.6 km |
| | Tidal | 101.4 km |
| **Length of Main River Embankment:** | Fluvial | 4.5 km |
| **Length of Environment Agency Tidal Defences:** | | 145.4 km |
| **Areas at risk from tidal flooding:** | | 97.5 km$^2$ |
| **Areas at risk from fluvial flooding:** | | 27.1km |
| **Ministry of Defence coastline:** | | 46.5km |

## Conservation

| | | |
|---|---|---|
| **Numbers of:** | Sites of Special Scientific Interest | 25 |
| | National Nature Reserves | 2 |
| | Local Nature Reserves | 11 |
| | Ramsar sites | 5 |
| | Special Protection Area | 2 |
| | Candidate Special Areas of Conservation | 1 |
| | Regionally Important Geological/ Geomorphological Sites | 0 |
| | Scheduled Ancient Monuments | 63 |

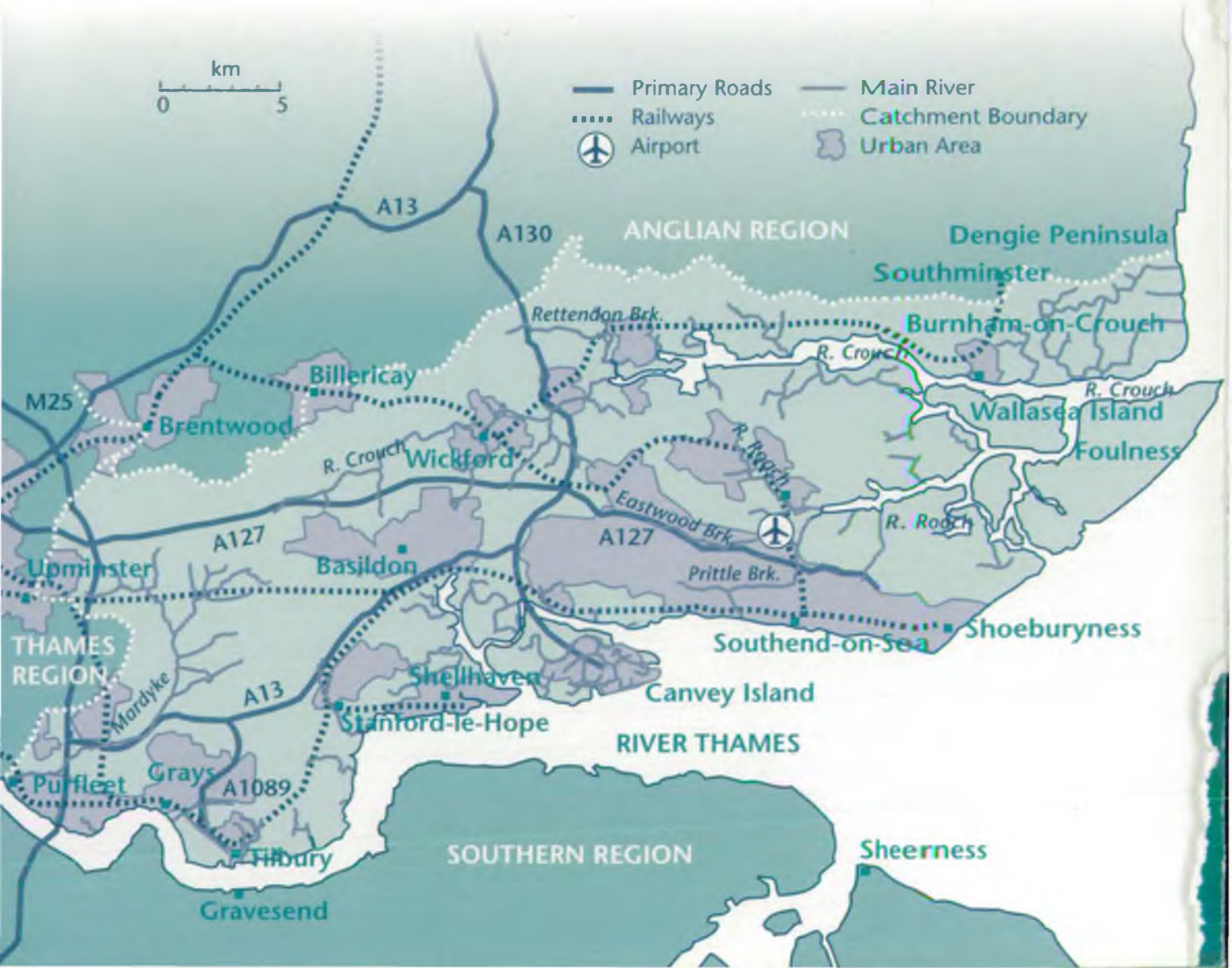
# key details

## General

| | | |
|---|---|---|
| Land Area | | 1841.45 km² |
| Ground levels | maximum | 104m AOD |
| | minimum | 0m AOD |

## Main Towns and Populations

| | Approx. |
|---|---|
| Southend-on-Sea (Municipal Borough) | 176 000 (whole borough) mid 1998 estimate |
| Canvey Island | 35 000 mid 1997 estimate |
| Basildon (Municipal Borough) | 164 000 up to date estimate |
| Benfleet/Hadleigh/ Thundersley | 49 100 mid 1997 estimate |
| Thurrock Borough | 143 962 mid 1998 estimate |
| Rayleigh | 77 287 (whole borough) mid 1998 estimate |



# your views

This Plan is the basis for consultation between the Environment Agency and all those organisations and individuals with an interest in the South Essex area. The Environment Agency is keen to hear your views on the following:

- **Do you agree with our draft Vision for Southern Essex?**
- **Have we highlighted all the major issues?**
- **Have we identified all the possible activities to address these issues?**
- **Which issues and actions do you consider to be of highest priority?**
- **Do you have any general comments to make regarding the Report?**

Comments on the Consultation Report should be sent to:

**Vicky Eade LEAP Officer**
**Customer Services**
**Environment Agency**
**Eastern Area - Anglian Region**
**Cobham Road**
**Ipswich**
**Suffolk IP3 9JE**

**Tel: 01473 727712**
**Fax: 01473 271320**

All comments must be received by 31st March 2000

Further copies of the report or more information on this LEAP can also be obtained from the above address.

We will collate responses to this Draft LEAP and publish the Final LEAP in August 2000. The Final LEAP will focus on the issues raised in this draft, and, in partnership with a number of other organisations, agreed actions to tackle these issues will be identified.



ENVIRONMENT AGENCY
088905

# FOREWORD

The Environment Agency is a major environmental protection organisation responsible for regulating waste disposal to land, industrial releases to air and for safeguarding and improving the natural water environment. Our overall aim of protecting and enhancing the environment, as a whole, contributes to the world-wide environmental goal of sustainable development. We are committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvements. LEAPs also allow us to deploy our resources to the best effect and optimise the benefit for the local environment.

The South Essex Draft LEAP is the fifth and final LEAP consultation document produced by Eastern Area, but follows new guidance recently implemented, which explains the somewhat different layout to the document.

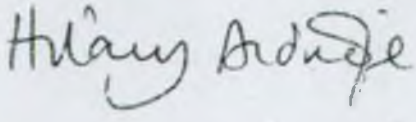
This plan provides a framework for consultation and a means of seeking commitment from those involved, to realise the full environmental potential of the South Essex area.

South Essex is a heavily industrialised area in which there are several major issues affecting the environment; traffic levels with major arterial roads and the M25, (see Map 1); the future of waste in Essex; the provision of adequate water resources for future planned development and the need to ensure adequate conservation and recreation opportunities.

Whilst the Plan will be a focus for the Environment Agency's actions, factors such as partnership, public participation and the involvement of business communities will be essential to secure success. LEAPs rely largely on building and promoting partnerships. Where improvement works are required to overcome local issues we aim to work with other organisations and individuals to promote a feeling of joint ownership and to initiate joint funding opportunities.

The issues that the Environment Agency has identified to be addressed are listed here. It will be essential reading for everyone concerned with the future of the area. We look forward to receiving your comments and contributions. *Your views are important.*

This Plan is being circulated widely and we are keen to draw upon the expertise and interests of individuals, local communities and local and national organisations. These will enable the final LEAP to be produced with an agreed five-year programme of activity to enhance and protect the South Essex area. We hope that this Plan will enable a wider public understanding and debate of environmental issues that are of local, national and global importance.



**Hilary Aldridge**
Area Manager (Eastern)


South Essex
Local Environment Agency Plan
Map : Transport
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Southminster
Burnham-on-Crouch
R Crouch
Foulness
Billericay
Brentwood
Wickford
Rayleigh
Rochford
Basildon
Upminster
Shoeburyness
Southend-on-Sea
Canvey Island
Stanford le Hope
Purfleet
Grays
Tilbury
A130
A12(T)
A127(T)
M25
A127
A13
A1089
Retendon Brk
Eastwood Brk
Prittle Brk
Mardyke
190000
180000
N
Towns
Catchment boundary
Main rivers
Motorway
Primary route
Railway
Proposed route of Channel Tunnel Rail Link
5 0 5 10 15 Kilometers

# OUR DRAFT VISION IS...

to create a better environment for present and future generations. This will be achieved on a local scale by working in partnership with other organisations and individuals to implement schemes that are of tangible benefit to the local environment and promote sustainable development.

Our prime objectives for the South Essex area are to:

- continue to improve the conservation value of the area, particularly with respect to protecting, enhancing and, where appropriate, restoring wetland and coastal habitats and associated flora and fauna;
- maintain and improve water quality, particularly where water quality targets are not being achieved;
- manage water resources in a sustainable manner to achieve a proper balance between the needs of the environment and those of abstractors and other water users;
- conserve features of archaeological and historic interest linked to the aquatic environment;
- provide effective flood defences and, where necessary, raise standards of protection, to maintain the integrity of the area's freshwater rivers and the coastal fringe;
- protect areas of groundwater that are vulnerable to pollution;
- liaise with local authorities by contributing to the production of Local Air Quality Management Plans, where required;
- provide effective regulation of industry, having regard to its needs while ensuring appropriate protection of the environment;
- develop and act on the National Waste Strategy and seek partnerships to encourage the reduction, reuse and recovery of waste in preference to disposal;
- maintain, develop and improve fisheries by meeting appropriate fisheries biomass target classes on freshwater rivers, and by the promotion of sound fisheries management policies on all still waters;
- interact with, listen and respond to the community and make a positive contribution towards sustainable development;
- seek opportunities to protect, improve and promote recreation; and,
- ensure that people's understanding, appreciation of and involvement with the environment continues to grow, through the provision of information, interpretation and education.

The Environment Agency will actively seek to reconcile the conflicting demands on the Plan area and target resources where they are most needed. Our objectives will be realised through establishing strong links with local communities, working together with conservation organisations, agriculture and industry and increasing public awareness of the need to protect our environment.

## Contents


| | Page No. |
|---|---|
| **1.0 Introduction** | **1** |
| 1.1 Reader's guide to the Draft LEAP | 1 |
| 1.2 The Environment Agency | 1 |
| 1.3 The LEAP Process | 2 |
| **2.0 Overview of the South Essex Area** | **5** |
| 2.1 Introduction | 5 |
| 2.2 Landscape and Heritage | 5 |
| 2.3 Nature Conservation | 5 |
| 2.4 Fisheries | 5 |
| 2.5 Recreation and Amenity | 7 |
| 2.6 Navigation | 8 |
| 2.7 Climate | 8 |
| 2.8 Hydrology and Hydrogeology | 8 |
| 2.9 Water Resources, Abstraction and Supply | 9 |
| 2.10 Industry and Commerce | 9 |
| 2.11 Radioactive Materials – Storage, Use and Disposal | 10 |
| 2.12 Air Quality | 11 |
| 2.13 Waste Management | 13 |
| 2.14 Water Quality | 13 |
| 2.15 Flood Defence | 14 |
| 2.16 The Built Environment and Development Plans | 16 |
| **3.0 Issues and Proposed Activities** | **19** |
| A complete list of issues contained within the report can be found on page 20. | |
| **4.0 Protection through Partnership** | **34** |
| 4.1 Introduction | 34 |
| 4.2 Improving Air Quality | 34 |
| 4.3 Managing Waste | 35 |
| 4.4 Managing our Water Resources | 36 |
| 4.5 Delivering Integrated River Basin Management | 37 |
| 4.6 Conserving the Land | 38 |
| 4.7 Managing our Freshwater Fisheries | 39 |
| 4.8 Enhancing Biodiversity | 40 |
| 4.9 Further Examples | 41 |
| **Appendices** | **36** |
| A Duties, Powers and Interests of the Environment Agency | 36 |
| B Glossary | 40 |
| C Abbreviations | 44 |


**List of Maps**


| | | |
|---|---|---|
| The South Essex LEAP Area | | inside front cover |
| 1 | Transport | ii |
| 2 | LEAP Location | 4 |
| 3 | Fisheries and Angling | 6 |
| 4 | Context | 17 |

# 1.0 Introduction

## 1.1 Readers Guide to this South Essex Draft LEAP

This is a management plan providing the following information:

- **Overview:** provides a general description of the Plan area.
- **Issues and Options:** highlights the environmental issues and proposes draft actions to help resolve them. This is not exhaustive.
- **Protection through Partnership:** considers some of the longer-term, ongoing, strategic management issues that may effectively be addressed in partnership with other organisations.

The draft Vision at the beginning of the Report and the proposed Actions will only be finalised and developed into a Strategy once we have reviewed and considered the responses to this Draft LEAP.

Please use the **Contents Table, Index and Glossary** to assist you further.

## 1.2 The Environment Agency

The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management. These duties together with those areas where we have an interest, but no powers in, are described in more detail in Appendix A. We are required and guided by Government to use these duties and powers in order to help achieve the objective of sustainable development. The Brundtland Commission defined sustainable development *"as development that meets the needs of the present without compromising the ability of future generations to meet their own needs."*

At the heart of sustainable development is the integration of human needs and the environment within which we live. Indeed the creation of the Agency itself was in part a recognition of the need to take a more integrated and longer-term view of environmental management at a national level. We therefore have to reflect this in the way we work and in the decisions we make.

Taking a long-term perspective will require us to anticipate risks and encourage precaution, particularly where impacts on the environment may have long-term effects, or when the effects are not reversible. We must also develop our role to educate and inform society as a whole, as well as carrying out our prevention and enforcement activities, in order to ensure continuing protection and enhancement of the environment.

**Our Vision is:**

- A better environment in England and Wales for present and future generations.

**Our aims, nationally, are:**

- To achieve major and continuous improvements in the quality of air, land and water.
- To encourage the conservation of natural resources, animals and plants.
- To make the most of pollution control and river basin management.
- To provide effective defence and warning systems to protect people and property against flooding from rivers and the sea.
- To reduce the amount of waste by encouraging people to re-use and recycle their waste.
- To improve standards of waste disposal.
- To manage water resources to achieve the proper balance between the Country's needs and the environment.

- To work with other organisations to reclaim contaminated land.
- To improve and develop salmon and freshwater fisheries.
- To conserve and improve river navigation.
- To tell people about environmental issues by educating and informing.
- To set priorities and work out solutions that society can afford.

**We will do this by:**

- being open and consulting others about our work;
- basing our decisions around sound science and research;
- valuing and developing our employees; and,
- being efficient and businesslike in all we do.

### 1.3 The LEAP Process

One of the key outcomes of the United Nations 'Earth Summit' held in Rio de Janeiro in 1992 was agreement by governments that, in order to solve global environmental problems, local action is crucial; we must all therefore think globally but act locally. For our part we are committed at the local level to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement.

LEAPs help us to identify and assess, prioritise and solve local environmental issues related to our functions, taking into account the views of our local customers. As a result LEAPs allow us to deploy our resources to best effect and optimise benefit for the local environment.

The LEAP process involves several stages as outlined below:

**Draft LEAP (This consultation report).** The publication of this South Essex Draft LEAP marks the start of a three month period of formal consultation and furthermore completes Eastern Area's cycle of consultation document. Consultation will begin with the following activities:

- Press release to advertise the Draft LEAP;
- Distribution of the Draft LEAP to key partners, consultees and libraries; and
- Display of leaflets and posters at various key sites in south Essex.

The purpose of the consultation period is to enable the Agency and all external organisations and the general public to express their opinions about the management of the area.

Your views will be considered in preparing the next phase, the final LEAP. At the end of the consultation period we will produce a **Statement on Public Consultation,** which will summarise the views expressed during the consultation process, together with our reply to these comments. This document will be available to all those who responded.

**LEAP** – The final LEAP report will take into account the results of consultation and the views expressed and will be published in the summer of 2000. It will contain an agreed Vision, strategy and detailed activity plans, identifying timescales and partner organisations. Progress will be monitored and reported annually, by means of **Annual Reviews**. After five years, or sooner if circumstances dictate, the Environment Agency will fully review the LEAP.

The Essex Area Environment Group (AEG) oversees the production of these reports. One of the group's roles is to advise the Agency and its statutory committees on proposals for LEAPs, and to comment on LEAP Reports prior to public release. The independent members of this group each have a particular environmental interest, but none are direct employees of the Agency. For instance, AEG members represent Water Companies, industry, local authorities, English Nature, the RSPB, fishery

interests, Harbour Authorities, the National Farmers Union and other various organisations. In order to assess individual LEAPs in greater detail, AEG sub-groups are formed. The sub-group is usually composed of 4-9 members of the Essex AEG with particular interest in this part of the county, and they spend considerable effort assessing and evaluating the issues raised within the area. We would like to thank the following AEG sub-group members for their assistance in compiling this Draft LEAP:

| | |
|---|---|
| Mr J Jenkinson MVO (AEG Chairman) | Ports Industry |
| Mr P Bradford | Essex & Suffolk Water |
| Mr K Green | Kent & Essex Sea Fisheries Committee |
| Mr P Holloway | Essex Angling Consultative Assoc. |
| Mr B S Hurley | Environmental Services Assoc. |
| Mr A J McDougal | Tilbury Power Station |
| Dr C F Mason | Regional Fisheries Advisory Committee |
| Cllr. P A Wexham | Southend-on-Sea Council |

Bordering this plan is our North Essex LEAP, and also the Roding, Beam and Ingrebourne LEAP which is produced our Thames Region (see Map 2).

**Partnerships and LEAPs**

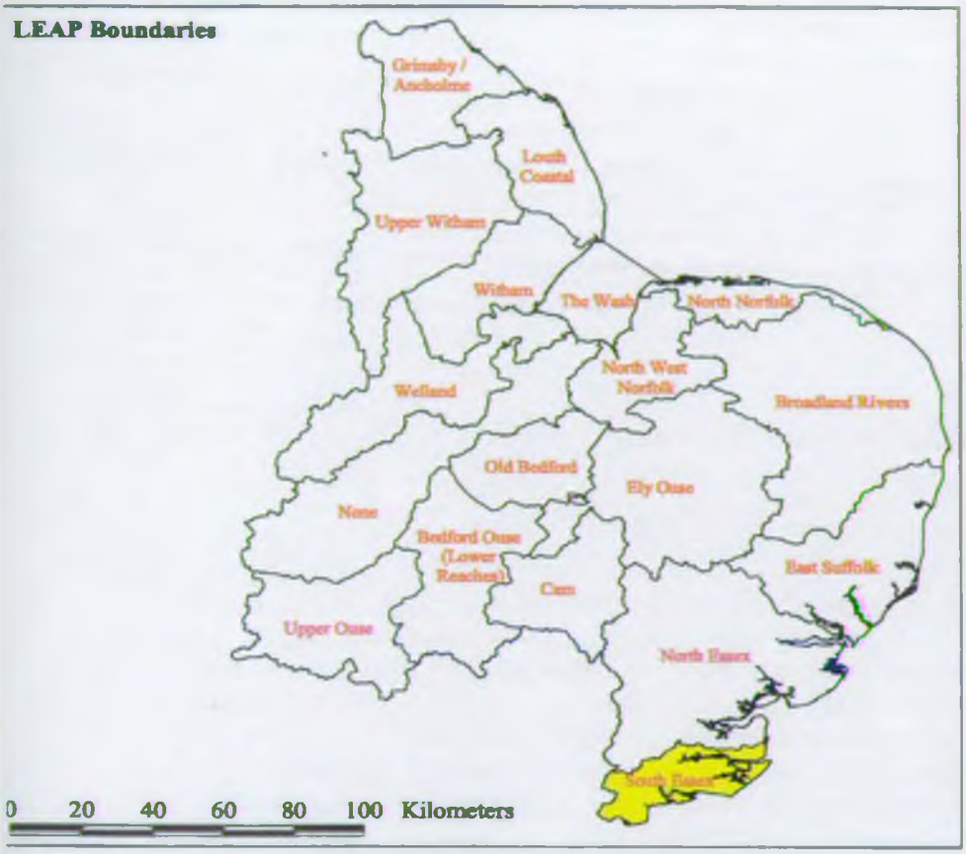
LEAPs rely largely on building and promoting partnerships. Where improvement works are required to overcome local issues we aim to work with other organisations and individuals to initiate joint funding opportunities. The Agency often has no powers to directly control all identified actions, and the responsible parties may be organisations which see little or no financial benefit in carrying out the actions. We therefore strive to build partnerships and encourage public participation, to increase awareness of environmental issues and promote a feeling of ownership. Section 4.0 expands on the theme of achieving improvements and protection of the environment through a partnership approach.

# South Essex
# Local Environment Agency Plan
# Map : LEAP Location

ENVIRONMENT AGENCY




## LEAP Boundaries




## LEAP Boundary

Grid References:
TL 500000 200000
TM 600000 200000
TQ 500000 100000
TR 600000 100000


N

## 2.0 Overview of the South Essex

### 2.1 Introduction

The South Essex LEAP contains the Rivers Crouch, Roach and Mardyke, the drainage network within Canvey Island, and numerous smaller rivers, many of which drain directly to the sea or the Thames Estuary. The area lies within the county of Essex, and also includes a small portion of the London Borough of Havering. The whole of the Unitary Authority of Southend-on-Sea and part of that for Thurrock fall within the plan boundary.

### 2.2 Landscape and Heritage

The principal land uses along Thames-side are industrial and associated port developments. Notably at Purfleet and Grays, redevelopment of former industrial sites with water frontages have created attractive new housing opportunities. Industrial Thameside forms a characteristic landscape. The oil refineries, docks, industry and power stations reflect the industrial heritage of this area and it's proximity to the City of London. Elsewhere, away from the coastal towns, agriculture predominates.

The former freshwater grazing marshes of the Thames, Crouch and Roach have mostly been drained and converted to arable farmland, but this trend has virtually ceased. The value of this classic landscape is recognised and encouraged in the designation of undeveloped parts of the Essex coast as Environmentally Sensitive Areas (ESAs).

The historic importance of the coastal fringe is clearly shown in the prolific archaeological features, from forts, castles and pillboxes to red hills, fish weirs and the wrecks and hulks of oyster smacks and barges. Inland, the remains of settlements, earthworks, historic buildings and archaeological artefacts are evidence of human occupation in South Essex from as far back as the Palaeolithic period.

### 2.3 Nature Conservation

Within South Essex some rich and varied wildlife has survived, despite the changes that have occurred as a result of agriculture, industry and increased urbanisation since the 1940s.

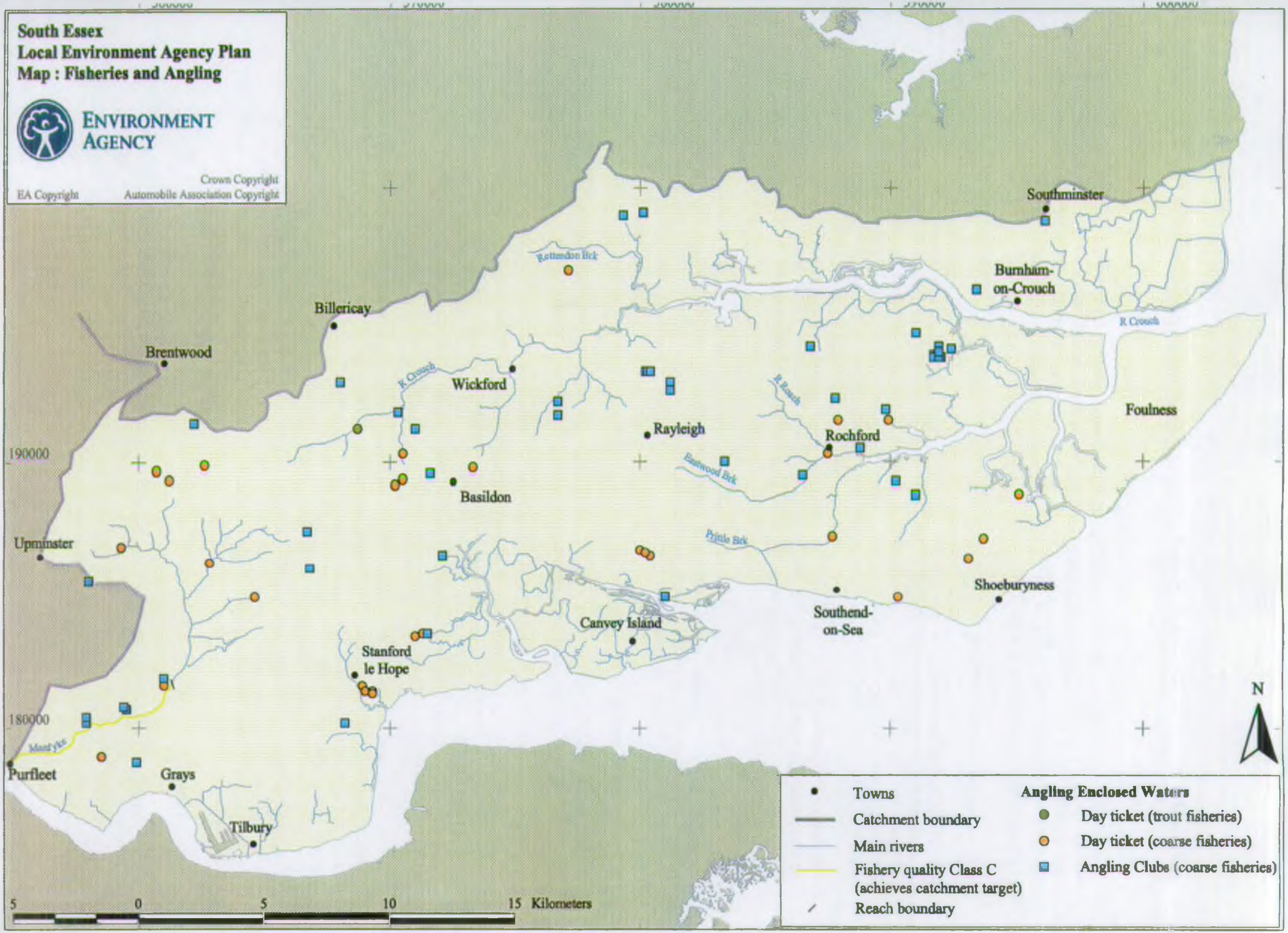
The importance of the catchment is highlighted by its many conservation designations. Large sections of the coast are designated as being of international importance for the habitats and species it supports. These internationally important sites are designated as candidate Special Areas of Conservation (cSACs), Special Protection Areas (SPAs) and Ramsar sites. Species found in internationally important numbers include dark bellied brent geese, oyster catcher and redshank which over winter on the estuaries.

Of national importance are the two national nature reserves and numerous SSSIs that cover a wide range of semi-natural habitats, including ancient woodland, saltings, mudflats, and grazing marsh. In addition there are many Sites of Importance for Nature Conservation (SINCs) which protect sites of county importance.

The Essex Biodiversity Action Plan identifies actions to conserve threatened species and habitats in Essex such as watervole, great crested newt, saline lagoons and reedbed (*see Protection through Partnership and Biodiversity Action Plans in South Essex Environmental Overview for more information*).

### 2.4 Fisheries

In angling terms there are no freshwater river fisheries within this South Essex LEAP other than the Mardyke (see Map 3). This river was surveyed in 1998 and fish stocks have shown a marked


South Essex
Local Environment Agency Plan
Map : Fisheries and Angling
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Southminster
Burnham-on-Crouch
R Crouch
Billericay
Brentwood
Wickford
Rayleigh
Rochford
Foulness
Basildon
Upminster
Shoeburyness
Southend-on-Sea
Canvey Island
Stanford le Hope
Purfleet
Grays
Tilbury
190000
180000
N
5 0 5 10 15 Kilometers
Towns
Catchment boundary
Main rivers
Fishery quality Class C (achieves catchment target)
Reach boundary
Angling Enclosed Waters
Day ticket (trout fisheries)
Day ticket (coarse fisheries)
Angling Clubs (coarse fisheries)

improvement since the previous survey in 1995, particularly in the upper reaches. Roach were dominant numerically; ten species and one hybrid type were represented. The lowest reaches continue to suffer from low dissolved oxygen levels and fish stocks are still relatively poor downstream of the A13 bridge. A feasibility study has been completed to evaluate the potential of environmental enhancements in the Mardyke which may be of benefit to fish populations.

A special survey was carried out on the headwaters of the Crouch and Roach and other streams throughout South Essex to identify fish stocks present which may be of angling and conservation value. The range of fish species present was extremely limited consisting mainly of three and ten spined sticklebacks. This is probably the result of low flows and variable water quality.

The most significant resource for inland fisheries are based on stillwaters which include agricultural reservoirs, lakes and ponds throughout South Essex. These lakes are managed by angling clubs or are run as commercial day ticket waters which may be heavily fished because of the high population density in South Essex and the proximity to London. Many of these lakes may be classed as overstocked carp fisheries and there are an increasing number of lakes stocked with exotic species such as wels catfish. Some 'put and take' trout fisheries also exist.

Angling of brackish and saltwater species occurs extensively in the estuaries and coastal waters from shores, piers and charter boats which operate mainly from Burnham-on-Crouch and Southend-on-Sea. Species regularly taken include cod, whiting, bass, skate and grey mullet.

Commercial eel fisheries exist in South Essex. Salmon occur in the Thames Estuary as a result of a stocking programme, but there are only occasional occurrences of salmon and migratory trout in other South Essex estuaries and there is no commercial fishery for these species. There is no fish farming of significance.

There are extensive and important shellfisheries, particularly oysters and cockles in the Crouch and Roach estuaries, around the Maplin Sands and off Southend-on-Sea.

The control and management of shellfisheries, marine fin, and crustacean fisheries is undertaken by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and/or the Kent and Essex Sea Fisheries Committee.

The Thames Estuary supports 114 species of fish and is of national and international importance as a spawning ground for many species. The management of the estuary is complex and is covered by Thames, Anglian and Southern Regions of the Environment Agency, CEFAS and the Kent and Essex Sea Fisheries Committee.

### 2.5 Recreation and Amenity

The South Essex coastline supports wildlife habitats of immense value, parts of which are protected by statutory nature conservation designations. The coast provides an important and valued resource for water and land based recreation.

The estuarial waters of the Thames, Crouch and Roach attract a wide range of recreational activities. The sheltered nature of these estuaries means that they offer secure moorings for sailing and cruising craft, and are exploited by other activities such as windsurfing, jet-skiing, sea kayaking, water skiing and wildfowling. Other coastal areas, such as Southend-on-Sea, are characterised by popular beaches. Seawalls provide access to the estuary, and vantage points for walkers and birdwatchers.

The management of these recreational activities is a major issue. An estuary management plan has been produced for the Thames (local authority/English Nature initiative) and a Harbour management plan for the Crouch and Roach (Crouch Harbour Authority initiative) and deal with watersports and recreational issues in detail.

The principal inland waters of this LEAP consist of the Crouch, Roach and Mardyke. These rivers and their tributaries are of limited width so their main recreational value is for angling and walking, although some stretches are suitable for canoeing.

The extensive rights of way network in Essex provides opportunities for walking, cycling and horse riding. Within south Essex there are six Country Parks that provide a focus for informal recreation and act as gateways to the wider countryside.

## 2.6 Navigation

There are no statutory rights of navigation on any of the rivers in this LEAP. The limited width of most river sections limits the potential for water based recreation. Canoeing on these rivers is permissible with riparian owner consent and organisations such as the British Canoe Union liaise with landowners to arrange this.

Navigation occurs on the two major estuaries within the plan. The Port of London Authority (PLA) is the statutory authority for navigation within the Thames Estuary whilst the Crouch Harbour Authority is the statutory body for the Crouch and Roach estuaries.

## 2.7 Climate

The Essex climate is typified by its low rainfall. There is little variation in the average monthly rainfall throughout the year. The average annual rainfall varies from approximately 600mm in the west, to 547mm in the east. Annual evapotranspiration averages 385mm in the west and 446mm in the east: most of this occurs during the summer months and exceeds rainfall totals over this period. However, winter rainfall and recharge provides the water required to offset this seasonal imbalance. Evapotranspiration is due to rise by 10% over the next 30 years in the eastern areas of England.

Climate changes naturally, but human impact on this process is now evident and believed to be causing more marked effects than would occur naturally. Since the industrial revolution (18$^{th}$ century), there has been a rise in the global mean surface air temperature of 0.6°C. 'Global warming', as this is now known, is potentially one of the most serious global environmental problems facing society. An increase in temperature of 0.5° is forecast for the East of England over the next 30 years.

## 2.8 Hydrology and Hydrogeology

Much of the land is relatively low lying (below 60m AODN) with the only areas of high ground located between Brentwood and Billericay to the north, the Langdon Hills at Basildon and the area of land between South Benfleet and Hockley in the east.

The catchment's rivers respond rapidly to rainfall due to the impermeable nature of the London Clay subsoil which underlies much of the area. Sand and gravel minor aquifers provide limited baseflows to these rivers. Flows are extremely low during the summer months due to the limited volumes of groundwater that can be naturally stored in these small aquifers.

The principal underlying aquifer is the chalk. This is exposed at, or near to, the ground surface around Thurrock, but elsewhere it is overlain by impermeable deposits of London clay. This limits the infiltration of rainfall to the chalk restricting this aquifers use for water resource development. Excepting the Mardyke in its lower stretches near Aveley, the chalk does not provide a groundwater discharge to any of the rivers.

The groundwater in the chalk flows in a south easterly direction, with water levels lowering from +10 m AODN in the west to -20 m AODN in the south east. At Burnham, Rayleigh and some parts of Thurrock, groundwater levels are rising in response to the cessation of long term water abstraction

during the 1970s. Groundwater quality is generally good around Thurrock, but becomes poor to the north and east, where the water contains high concentrations of chloride and sodium.

There is an extensive network of hydrometric monitoring stations covering rainfall, river flows, groundwater levels, salinity, tide levels and wind speed parameters. Where these are needed for flood warning purposes the gauges are connected to the Agency's telemetry system.

### 2.9 Water Resources, Abstraction and Supply

Within the Agency's role is the requirement to balance the varied and competing needs for water resources. These include human needs, such as potable water supply, industry and agriculture, as well as those of the general water environment such as rivers, springs and wetlands. The density of winter storage reservoirs in this catchment is the greatest of any LEAP area within Eastern Area.

Water resource available for Public Water Supply within the catchment is very limited. Essex and Suffolk Water estimate that 95% of the demand within south Essex is achieved by importing water from either Hanningfield, Langford, Layer and Langham Treatment Works, all of which are situated north of the South Essex LEAP boundary. These supply sources themselves make heavy use of water imports via the Ely Ouse to Essex Transfer Scheme.

Overall availability is assessed by reference to river flows and the long-term average recharge to the aquifer from rainfall. The allocation of water resources is regulated by abstraction licences issued by the Agency under the *Water Resources Act 1991*. Groundwater balances for the catchment are currently under review and will be published as part of the forthcoming Water Resource Strategy. Licences are only issued if there is sufficient water available and the need for the water is justified, and that the rights of existing users are protected and rivers, springs or wetland sites, are not unacceptably affected. As water resources continue to be developed it is becoming common practice to include conditions in licences to safeguard these interests, most licences are also now issued on a time-limited basis.

Many new applications require an environmental appraisal to ensure that nature conservation sites and the water environment are not unacceptably affected.

The current policy with respect to availability of water for licensed abstraction is as follows:

- No additional groundwater resources are available for licensing, as the long term resource is currently fully committed to the requirements of existing licence holders.
- No additional summer surface water is available for abstraction.
- Some additional winter surface water is available for abstraction during periods when river flows are naturally high. However, applications for winter water from streams that discharge over inter-tidal mudflats in designated SPAs will require significant supporting information in the form of environmental appraisal in order to receive consideration by the Agency.

There are no public water supply abstractions from surface waters within the area. Groundwater is abstracted for public supply at two sites, Linford and Stifford, and the Agency has focussed on pollution prevention activities within the groundwater protection zones.

### 2.10 Industry and Commerce

South Essex has a very wide range of industry and commerce. Along the estuary there is a substantial amount of heavy industry and associated power generation, together with ports, bulk terminals and bulk storage facilities. Throughout the area there are light industries, service industries and

agriculture. In addition there are major conurbations and several large landfill sites. There is also a well developed transport infrastructure which will be complimented by the second phase of the Channel Tunnel Rail Link which is due for construction in 2001.

The concentration of industrial processes along the estuary, together with a similar concentration on the southern side of the estuary in Kent and the proximity to London and the M25, need to be considered as a whole. It is for this reason that Her Majesty's Inspectorate of Pollution carried out 'An Assessment of the Effects of Nitrogen Oxides in the East Thames Corridor' (HMSO 1993). The need for continuing work in this field is acknowledged and the effects are now being studied as one of the Zones of Industrial Pollution Sources (ZIPS) with the lead being taken by the Thames Region of the Agency. This will extend the normal single site assessment of large industrial processes to include assessment of possible multi-site effects.

Future changes in the area include the proposed closure of the Shell oil refinery at Shell Haven. This will result in a decrease in releases from the site. Future uses for the site are under discussion and the Agency is involved in these. Remediation of the site will be carried out as appropriate to make the site fit for its future uses. A new power station situated at Coryton is due for construction within the next year.

The Essex & Southend Waste Local Plan (Deposit Draft October 1998) has identified a need for other means of disposal of waste. The plan advocates that municipal waste incineration be considered as an option. Such an incinerator would, if built, would be regulated by ourselves under Integrated Pollution Control.

Due to the diverse nature of the many industrial and commercial activities, some pollution risk invariably exists. However, we continue to work to minimise the risk of pollution through the use of pollution prevention initiatives and contingency planning with port authorities

### 2.11 Radioactive Materials – Storage, Use and Disposal

Within South Essex medical diagnosis and therapy, scientific research and specialised industrial applications are examples of the beneficial use of radioactive substances. However, most operations involving the use of radioactive material generate radioactive wastes that need to be appropriately controlled. These wastes can occur as gases, liquids or solids. Airborne and liquid waste may be discharged to the environment, after treatment if necessary, while solids are disposed of to appropriate sites or stored until a suitable disposal route becomes available.

Radioactivity also occurs through natural sources. Most radiation exposure to the population is through cosmic rays, gamma rays from the earth, radon and through decay products in the air, and various naturally occurring radionuclides in foodstuffs. Very little exposure (less than 0.1%) results from the discharge of airborne or liquid radioactive waste. The volume of solid radioactive waste is small in comparison with other wastes, accounting for only 0.02% of the total annual waste production in the UK, and nearly four-fifths of the radioactive waste that is produced contains only a relatively small amount of radioactivity.

The Agency regulates the keeping, use and disposal of radioactive material under the Radioactive Substances Act 1993. The Agency also registers users of radioactive material, and premises where radioactive sources may be kept and used. Conditions are imposed to ensure that holdings and transfers are properly recorded and supervised, and that correct procedures are in place for ensuring the proper disposal at the end of the useful life of the sources.

The Agency is also responsible for issuing authorisations to those undertakings that generate and dispose of radioactive waste, whether to air, the aquatic environment, landfill, or special repositories. We ensure that proper assessments of the impact on the environment are carried out and that the disposal is undertaken in such a way as to prevent harm to humans or to the environment. The

Agency also ensures that disposal conforms to the requirements of Government policy. The list of sites where authorisations have been granted within south Essex is given in Table 1 below.

**Table 1.**

| Council | Company | National Grid Reference | Authorised Process |
|---|---|---|---|
| Basildon | Basildon & Thurrock General Hospitals NHS Trust, Basildon | TQ 7000 8720 | Patient Diagnosis & Treatment |
| Rochford | Flightspares Ltd, Aviation Way, Southend Airport, Southend-on-Sea | TQ 8660 8950 | Luminous Instruments |
| Southend-on-Sea | Southend Hospital NDS Trust, Prittlewell Chase, Westcliff | TQ 8640 8730 | Patient Diagnosis and Treatment |
| Thurrock | Shell UK Ltd, Shellhaven, The Manorway, Stanford-le-Hope | TQ 7320 8260 | Testing using Tracers |
| Thurrock | BP Oil UK Ltd, Coryton Refinery, The Manorway, Stanford-le-Hope | TQ 7440 8230 | Testing using Tracers |

In the context of use of radioactive substances, the Agency applies the guiding principle of "As Low As Reasonably Achievable" (ALARA) and, because radioactivity can be measured accurately in very low concentrations, standards set on users are high.

### 2.12 Air Quality

Air quality is an important factor influencing the standard of human life. Air pollution can cause problems for people with asthma, bronchitis and other respiratory diseases. It can also damage flora, fauna and buildings, and have significant effects on soil, water and climate. Severe air pollution used to exist in heavily urbanised and industrialised areas. These problems have since been tackled by legislation and considerable progress has been made in improving air quality over the last 50 years. Further progress will probably be at a slower rate as the pollutant concentrations involved are much harder to measure and eliminate than in the past.

Local authorities have been given the responsibility for implementing the Government's National Air Quality Strategy at a local level. This will involve creating Air Quality Management Areas, where air quality standards are not being met and drawing up Action Plans to improve the situation. The Agency will work with local authorities to clarify responsibilities for implementing the National Air Quality Strategy and to provide relevant information where appropriate *(see also Section 4.2, 'Air Quality Management').*

Local authorities have the main responsibility for managing air quality, for the regulation of smaller, less complex industrial processes and for reducing traffic pollution. The responsibility for action regarding statutory nuisances (such as smoke, fumes, gases, dust, steam, smell and noise) is also with local authorities. The Agency has a direct responsibility with respect to air quality through the system of Integrated Pollution Control (IPC) which is used to regulate the most potentially polluting industrial processes. Within South Essex there are currently fourteen IPC sites, details of which are shown in Table 2.

**Table 2.**

| Council | Company | National Grid Reference | IPC Process Type |
|---|---|---|---|
| Rochford | Defence Evaluation & Research Agency, DERA, Shoeburyness, Southend-on-Sea, SS3 9SR | TL 6920 0520 | Incineration |
| Southend | Towerfield Plating, Towerfield Close, Towerfield Industrial Estate, Shoeburyness, Southend-on-Sea, SS3 9QP | TQ 9344 8516 | Inorganic Chemicals |
| Thurrock Unitary Council | Chemviron Carbon, 434 London Road, Grays, RM20 3NJ | TQ 5960 7780 | Recovery Process<br>Inorganic Chemicals |
| | Lafarge Aluminates, 730 London Road, Grays, RM20 3NJ | TQ 5730 7800 | Cement Process |
| | BPB Paperboard, Purfleet Mill, London Road, Purfleet, RM19 1RE | TQ 5600 7770 | Paper and Pulp Process<br>Combustion Process |
| | Shell UK Ltd, Shellhaven, The Manorway, Stanford-le Hope, SS17 9LD | TQ 7320 8260 | Combustion Process<br>Gasification Process<br>Petroleum Process |
| | Industrial Zeolite, Titan Works, Hogg Lane, Grays, RM17 5DU | TQ 6120 7860 | Organic Chemicals |
| | Cargill Plc, Port of Tilbury, Tilbury, RM18 7PU | TQ6210 7690 | Halogen Process |
| | Procter & Gamble Ltd, Hedley Avenue, Grays, West Thurrock, RM16 1AL | TQ 5950 7740 | Acid Processes |
| | National Power PLC, Tilbury Power Station, Fort Road, Tilbury, RM18 8UJ | TQ 6620 7560 | Combustion Process |
| | BP (Oil) UK, Coryton Refinery, The Manorway, Stanford-le-Hope, Essex, SS17 9LL | TQ 7440 8230 | Petroleum Process<br>Combustion Process |
| Basildon | New Holland UK Ltd, Cranes Farm Road, Basildon, SS14 3AD | TQ 7140 9040 | Combustion Process |
| | Wollaston Engineering Ltd, 11 Wollaston Crescent, Wollaston Industrial Estate, Burnt Mills, Basildon, SS13 1QQ | TQ 7460 9060 | Inorganic Chemicals |
| Chelmsford | Billericay Farm Services Ltd, Ilgars Fertiliser Works, Creep Hedge Lane, Woodham Ferrers, Chelmsford | TQ 7940 9870 | Chemical Fertilisers |

The Agency has a responsibility to monitor all impacts on air quality, not only those that originate from industry. As waste breaks down in a landfill site it produces a polluting liquid (leachate) and landfill gas, the majority of which is carbon dioxide and methane. Methane is a greenhouse gas linked to global warming. It has, volume for volume, a 21 times greater effect than carbon dioxide. Methane can be burnt (flared) on site and the energy produced used to generate power. Use of landfill gas is beneficial in two ways, as it: reduces the methane emission into the atmosphere as it is broken down to carbon dioxide (a less potent greenhouse gas) through flaring; and reduces the amount of fossil fuel consumed.

## 2.13 Waste Management

Activities within and outside the plan area create a mixture of household, industrial and commercial wastes, which are collectively termed 'controlled' wastes. Essex, and particularly the south of the county, takes a significant proportion of wastes produced in London and south-east England. This is because of historical practices and the fact that there are a number of large, conveniently located holes in the ground having previously been quarried for clay, chalk and gravels. As such, landfill is almost exclusively used for the vast majority of the waste disposed in South Essex.

There are four sites licensed to accept household wastes, of which two also accept hazardous wastes and are significant nationally, see Table 3.

**Table 3.**

| Council | Company | Nat. Grid Reference | Waste type |
|---|---|---|---|
| Basildon | Cleanaway Ltd.<br>Pitsea | TQ750853 | Hazardous, household |
| Rochford | Cory Environmental Ltd.<br>Barling | TQ940905 | Household |
| Thurrock | Cleanaway Ltd.<br>South Ockendon | TQ607835 | Household |
| Thurrock | Cory Environmental Ltd.<br>Mucking | TQ690800 | Hazardous, household |

Landfill sites have the potential to pollute the environment, as do other waste management sites but to a lesser degree. The Agency regulates the operation of waste sites by means of a Waste Management Licence. This sets out conditions that control all aspects of the way in which the site is run in order to prevent pollution occurring. Sites are regularly inspected to verify compliance with the licence. Scientific monitoring is carried out on landfill gas, leachate, groundwater and surface waters. Older landfill sites in particular, either open or closed, have the potential to cause problems as a result of having operated before effective regulation was introduced.

We investigate illegal waste disposal operations and take suitable enforcement action against them. Efforts are focused on activities which are either large scale, persistent or involve hazardous materials.

Businesses will be encouraged to introduce improvements to resource management in order to minimise waste and to contribute to sustainable development.

## 2.14 Water Quality

Industry and agriculture have important roles to play. Significant urban areas also exist, particularly in the south within the Thames Estuary corridor. Consequently it is important that measures to prevent pollution are enforced to ensure that pollution from these activities is kept to a minimum. The majority of sewage effluent and surface water generated by the large urban population, however, is discharged to tidal waters, principally the aforementioned Thames Estuary but significant amounts are also discharged to the Crouch and Roach Estuaries.

A chemical and biological monitoring programme is in place to assess and quantify the quality of the main watercourses and identify areas in need of improvement. Water quality is generally graded as being fair. Where the quality is not as good as expected then this needs to be investigated and mechanisms for improvements sought and implemented.

The watercourses within this catchment are all relatively small and have little flow in dry weather. Most are also affected by heavy urbanisation that can give rise to contaminated surface water drainage

and high rates of discharge in heavy rain resulting in fluctuations in water flow and depth. Accidental spillages and deliberate discharges also affect water quality and in many cases the polluter may be unaware of the effect on rivers due to misconnections within the sewerage system. This type of pollution is difficult to trace and control, and requires disproportionate enforcement resources. Campaign strategies have been employed to tackle the worst cases but considerable work remains to be done.

All of these factors combine to give a fair water quality overall in the freshwater streams. This has historically resulted in a low perception of the viable river uses and as a consequence rather undemanding target quality objectives have been set. There is scope for considering the desire, need and potential for enhancing water quality targets. Therefore these have been reviewed as part of the LEAP process.

Estuarine waters are widely used for recreation. Certain waters are also designated shellfisheries within the terms of the EC Shellfish Water Directive and the EC Shellfish Hygiene Directive. High standards of bacteriological quality are a requirement of the Hygiene Directive, whilst a variety of water quality determinands, including bacteria, are measured to assess shellfish water quality.

As with the freshwater catchments, the estuarine waters are subject to a sampling programme in order to monitor the water quality for EC Directives, such as the Shellfish Water Directive, and also for quality classification purposes.

It should be noted that the discharges, mostly moderate or large sewage effluents, made direct to the Thames Estuary, and the water quality of the estuary itself, are monitored by our Thames Region, and are therefore not covered in depth in this plan. However, the surface water and storm overflows from the sewerage of these conurbations are of major significance to the streams within the Anglian Region's responsibility.

The extensive waste disposal and industrial activity on Thameside, with associated contaminated land has water quality implications, especially in the chalk and gravel aquifers. Mitigation and remedial measures are a substantial consideration and are likely to become more so as brown field development proceeds.

The groundwater regulations (1998) were fully implemented in the United Kingdom on the 1st April 1999. The purpose of the regulation is to prevent the pollution of groundwater. This is achieved by preventing list 1 (the most toxic) substances from entering the groundwater, these include pesticides and preventing the pollution of groundwater of less toxic list 2 substances. Where disposal of these substances take place, the Agency will authorise this with appropriate conditions or in some cases refuse permission. Activities which do not involve disposal, but where leakage or loss of listed substances have the potential to occur, should adhere to approved codes of practice (to be approved as Statutory Codes by the Government in due course). Where more specific controls are needed to protect the groundwater, the Agency will be able to serve a Notice with conditions which would need to be complied with.

### 2.15 Flood Defence

Flood defence deals with the provision of cost effective, technically sound, sustainable defence for people and property against flooding from rivers and the sea. Sustainable flood defences include soft engineering options such as beach recharge ("feeding" the foreshore with suitable material) and managed realignment. A study is currently being undertaken on the Crouch and Roach estuaries to look at the future of the defences, given economic and nature considerations, to produce a more sustainable estuary morphology.

Flood defence work is carried out to low-lying land at risk from tidal flooding, and predicted sea level rise for East Anglia will threaten parts of south Essex. At increasing risk is land alongside the Crouch and Roach, including the Ministry of Defence land at Foulness.

The low lying land alongside the River Thames from Southend to Purfleet including Canvey Island is protected to a much higher standard than anywhere within our Anglian Region. The defences here were constructed as part of the Thames Tidal Defences under the 1972 Thames Barrier and Flood Prevention Act; these defences continue along the north bank of the Thames up to the Woolwich barrier.

Capital Flood Defence Schemes are set out by our Long Term Plan, the development and implementation of which is overseen by the Essex Local Flood Defence Committee. An example of this is the works carried out recently to improve the defences at Althorne on the north bank of the River Crouch.

Having completed any initial capital improvements, planned preventative maintenance to coastal frontages, river channels and control structures, forms part of the annual routine maintenance programme. These works help preserve the integrity of the sea and tidal defences and maintain the flood discharge capacity of the Main Rivers. All works are carried out in accordance with guidelines to ensure that maintenance is sympathetic to the environment, by limiting damage and wherever possible, carrying out positive enhancement works as part of the operations works.

The programme is funded principally by a levy on the County Council supported by General Drainage Charge contributions within the Essex Flood Defence Committee area.

A series of Shoreline Management Plans (SMPs) have also been prepared for the coastline. A Shoreline Management Plan is a document which sets out a strategy for coastal defence for a specified tidal frontage taking account of natural coastal processes and human (and other) environmental influences and needs. Research has suggested that the coastline of England and Wales can be divided into eleven major sediment cells. A sediment cell is defined as a length of coastline that is relatively self-contained, as far as the movement of sand and shingle is concerned and where interruption to such movement would not have a significant effect on adjacent cells. Shoreline Management Plans provide the vehicle for the long-term sustainable protection of our coastlines and are part of an initiative backed by MAFF, Welsh Office, Local Government Association, English Nature and the Environment Agency. The South Essex coast falls into Sediment Cell 3, from the Wash to the Thames. Although this cell forms a discreet unit it has been divided into sub-cells to provide a more practical basis for the initial production of SMPs. The South Essex coast falls into sub-cell 3D of the Essex SMP.

The Agency is involved in a joint project with English Nature (funded by EU LIFE money to develop Coastal Habitat Management Plans (CHaMPs). These documents will ensure that future SMPs are compliant with the Habitats Directive.

Development proposals in flood risk areas, works affecting flood defences, and works which could adversely affect the flows in watercourses are controlled by the Agency under statute (independent of local authority development powers). In exercising these powers, we seeks public adherence to our 'Policy and Practice for the Protection of Floodplains' and our 'Culverting Policy.'

In Easter 1998, severe freshwater flooding affected parts of Northamptonshire and Cambridgeshire and a subsequent Inquiry was undertaken. South Essex was unaffected during this event, but the Inspectors report (the Bye Report) recommended actions to avoid and ameliorate future damage from a repeat of that storm on any catchment: some of these recommendations dealt with the Agency's management of flood defence. A list of Flood Defence Actions was compiled, and by April 2000 these measures will be incorporated within our management systems.

We are also responsible for dissemination of flood warning information to those at risk in fluvial as well as coastal locations.

### 2.16 The Built Environment and Development Plans

Development within our cities, towns and countryside has a major impact upon our environment. Such development may include new building works, changes in land use and the development of communication systems and other infrastructure. Change in land use resulting from development is regulated under the Town and Country Planning system. Development plans are produced by County, Unitary and Local Planning Authorities to set the pattern for development, and the Agency is a statutory consultee on these strategic plans. See Table 4 for a comprehensive list produced by the local planning authorities and Map 4 shows the location of these authorities.

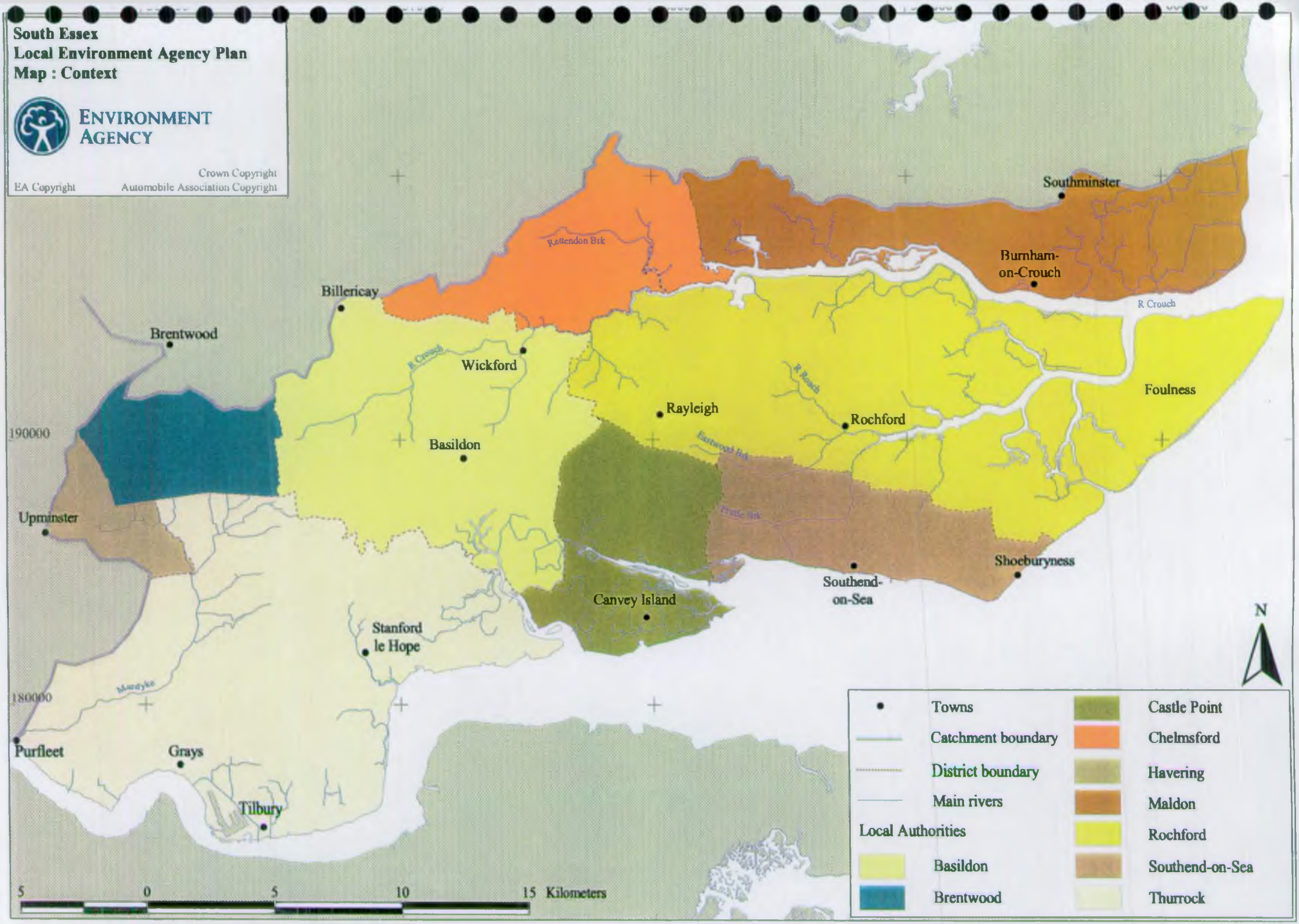
**Table 4.**

| Local Authority | Plan Status | Date |
|---|---|---|
| Essex County Council | | |
| -Structure Plan | Approved | Mar 1982 |
| -First Alteration | Approved | Jul 1991 |
| -Second Alteration | Adopted | Jan 1995 |
| -Minerals Local Plan First Review | Adopted | Nov 1996 |
| -Waste Local Plan (with Southend on Sea) | Deposit Draft | Oct 1998 |
| Basildon District Council – Local Plan | Adopted | Mar 1998 |
| Brentwood Borough Council- Local Plan | Adopted | Mar 1995 |
| Castle Point Borough Council- Local Plan | Adopted | Nov 1998 |
| Chelmsford Borough Council- Local Plan | Adopted | Apr 1998 |
| Review | Issues Report | Apr 1999 |
| Havering Unitary Authority- Unitary Development Plan | Adopted | Mar 1993 |
| Maldon District Council- Local Plan | Adopted | Aug 1996 |
| Rochford District Council- Local Plan | Adopted | Apr 1995 |
| Southend-on-Sea Borough Council- Local Plan | Adopted | Mar 1994 |
| Thurrock Council- Local Plan | Adopted | Sep 1997 |
| -Unitary Development Plan | Issues Report | May 1999 |

The Essex Structure Plan sets out key strategic policies as a framework to feed into Local Plans, as well as providing guidance to statutory and other organisations for their own plans and programmes.

Due to boundary changes on 1st April 1998, Thurrock and Southend-on-Sea became Unitary Authorities. Thurrock will be producing its own Development Plan outside the remit of the Essex Structure Plan. Southend-on-Sea has become a joint Structure Planning Authority with Essex County Council for the replacement Structure Plan. The replacement plan has recently been subject to an Examination in Public, with the intention for adoption in early 2000.

Included within the development plan process, are plans at the county level to manage waste and minerals extractions. The Minerals Local Plan was adopted in November 1996 prior to the boundary changes, and still covers Thurrock as well as the rest of Essex and Southend. The Waste Local Plan is also being produced jointly by Essex County Council and Southend-on-Sea Council: it has recently been subject to an Examination in Public, with an intention for adoption in late 2000. Thurrock Council will include waste planning matters within their own Unitary Development Plan, currently under preparation.


South Essex
Local Environment Agency Plan
Map : Context
ENVIRONMENT AGENCY
Crown Copyright
EA Copyright
Automobile Association Copyright
Southminster
Burnham-on-Crouch
Billericay
Brentwood
Wickford
Basildon
Rayleigh
Rochford
Foulness
Upminster
Shoeburyness
Southend-on-Sea
Canvey Island
Stanford le Hope
Purfleet
Grays
Tilbury
190000
180000
R Crouch
R Roach
Rettendon Brk
Eastwood Brk
Prittle Brk
Mardyke
N
5 0 5 10 15 Kilometers
Towns
Catchment boundary
District boundary
Main rivers
Local Authorities
Basildon
Brentwood
Castle Point
Chelmsford
Havering
Maldon
Rochford
Southend-on-Sea
Thurrock

All development plans are increasingly recognising the importance of sustainable development. As a result, many policies exist to protect the natural environment, including requirements at all levels to prevent pollution of surface and ground waters, protection of river corridors and enhancing biodiversity. The Agency promotes adoption of suitable policies, many of which reflect, are compatible with, or are drawn from its own internal functional guidance.

## 3.0 Issues and Proposed Activities

In September 1997, the Environment Agency produced a national document entitled 'An Environmental Strategy for the Millennium and Beyond.' This strategy is essentially based upon the need to take an integrated approach to the management of the whole environment. We will deliver this strategy at a local level by dialogue between ourselves and the various organisations involved in the protection and management of the environment.

Our principal and immediate environmental concerns are stated in this Strategy and relate to nine themes which represent the Agency's new holistic approach to environmental management. The themes and their emblems are:

- **Addressing climate change** 
- **Regulating major industries** 
- **Improving air quality** 
- **Managing waste** 
- **Managing our water resources** 
- **Delivering integrated river basin management** 
- **Conserving the land** 
- **Managing our freshwater fisheries** 
- **Enhancing biodiversity** 

As a first step towards achieving our aims and delivering our strategy, issues have been raised and proposed actions have been identified, which now require to be consulted on. Each issue relates to one or more themes, as indicated by the following matrix.

As a first step towards achieving our aims and delivering our strategy, issues have been raised and proposed actions have been identified, which now require to be consulted on.

Our intended approach for dealing with these challenges is set out in the following text, which show:

The **Title** of the Issue;
The Agency **Contact** for the Issue;
Supporting **Background text** to explain the Issue; and

Proposed **Activities** for resolution of the Issue, and how these activities relate to our Environmental Strategy themes.

The following points should also be noted:

Our everyday work commits substantial resources to monitoring and managing the environment.

Some actions will require feasibility studies and costs-benefit appraisal of activities prior to work commencing. In some cases, depending on the outcome of these studies, further action may not be justified.

This is only a draft plan, should more Issues or Activities become apparent during the consultation period, these will be added, where appropriate.

Options are not mutually exclusive and are not in any order of priority.

## Titles of LEAP Issues

1. Requirement for environmental enhancement of rivers within the LEAP area.
2. The need to support and to progress the options identified in the Mardyke Feasibility Study.
3. Failure to achieve water quality and biological targets at a number of sites in the Plan area.
4. Failure to meet River Ecosystem Class 3 for Dissolved Oxygen in the Lower Mardyke.
5. Concern about rising groundwater levels.
6. Concern over water availability with regard to future housing requirements.
7. Water resource availability for spray irrigation of crops.
8. Fly-tipping.
9. Awareness and support of fisheries issues within the Thames Estuary Partnership Action Plan.
10. The Blue Flag award for Southend-on-Sea Bathing Beach.
11. Contamination from waste disposal sites in shoreline locations.
12. Potential impact of climate change on sea levels and coastal protection.

## Issue 1: Requirement for environmental enhancement of rivers within the LEAP area.

*Contact:* *Kate Potter & Mike Webley*

### Background

Until the 1970s, river management across the Region was driven by agricultural policies to improve land drainage within floodplains to maximise cereal production and provide land for development. These activities have resulted in the loss of many in channel and floodplain habitats. In South Essex, land drainage improvement schemes and the pressures of development have resulted in the degradation of many watercourses. These schemes have led to a loss of physical features and a general reduction in the ecological value of these watercourses.

It has been highlighted that there are several watercourses which are currently of little ecological or amenity value, but which have the potential for environmental enhancement.

Prittle Brook is a major watercourse which flows through Southend-on-Sea. A successful flood protection scheme was constructed in the late 1970s, but this has contributed to limited habitat diversity within the canalised concrete channel. The brook suffers from low flows and is flashy in nature. Although spring fed in its upper reaches, the brook is predominantly fed by land drainage and

surface water run-off, with flood flows diverted via a relief tunnel to the river Thames. Where the brook runs through Southend there are still some relatively natural sections through the towns' park areas and watervole have been recorded at these locations. The watercourse can suffer from poor water quality as result of its urban location.

Eastwood Brook rises at Rayleigh weir and is thought to be spring fed at this point. The flood defences of this brook were improved around the same time as those on Prittle Brook, which has resulted in Eastwood Brook being concrete for much of its length. This brook can also suffer from water quality problems as a result of its urban environment and the location of a number of industrial estates that discharge to the brook. Efforts to improve the water quality of the brook, mainly in the form of pollution prevention inspections have been, and continue to be, undertaken.

Although their urban environment limits both of these watercourses, there may be some potential for environmental enhancement. Their location within a major town means that they would benefit greatly from improved access, and water quality improvements will go some way toward improving the natural environment. Replacing the concrete channel with a more natural channel will be costly and may be constrained by existing development and the requirements of flood defence protection standards.

The need for habitat improvements has also been identified in the Essex Biodiversity Action Plan. The Agency is the lead partner for six riverine species in Essex and the needs for habitat improvements, particularly in the south of the county, have been identified as Actions in these plans.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Identify and undertake river/floodplain rehabilitation schemes and habitat enhancements with other bodies. This should be on a prioritised basis according to the benefits derived from the work, and when resources are available | Environment Agency<br>Essex County Council<br>Local Authorities<br>Landowners, Developers<br>English Nature<br>Essex Wildlife Trust<br>RSPB |  |
| 2. Ensure flood defence works are done in a sympathetic manner, with the use of minimum environmental standards and conservation plans, ensuring that all options are considered and that environmental appraisals are produced | Environment Agency<br>Essex County Council<br>Local Authorities<br>Landowners<br>Developers<br>English Nature |  |
| 3. Implement the Agency's Culverting Policy to resist the culverting of watercourses and where practical, have existing culverts restored to open channels | Environment Agency<br>Planning Authorities<br>Developers |  <br>  |

**Issue 2:** **The need to support and to progress the options identified in the Mardyke Feasibility Study** (also see Protection through Partnership Section 4.5).

*Contact:* *Kate Potter*

**Background**

In August 1998, the Environment and Agency and the Countryside Commission (now the Countryside Agency) commissioned a study to identify a range of potential environmental enhancement options for improving the Mardyke and to assess their feasibility. The project was undertaken in consultation with a Steering Group comprising members from the Agency, Countryside Commission, Thames Chase and Thurrock Unitary Authority, all of whom are involved in the management of the Mardyke valley.

The Mardyke lies in an open valley, which is an important landscape of significant local and regional heritage value. The valley has been subject to a long history of change, which has contributed, to a reduction in habitat diversity and amenity value of both the watercourse and the associated valley. The Mardyke has long suffered from poor water quality and fisheries failures in its lower reaches. This river is an unusual watercourse in that its only significant source of water is run-off or consented discharges, and is tide locked for around 12 hours a day, which results in very slow flows.

The study identified a number of options for environmental enhancement centred on water quality improvements, habitat and landscape enhancements and recreational and educational strategies. These options are now being progressed by the partners via a number of funding routes including a Heritage Lottery Bid and a landfill tax bid. The proposed activities listed above are those, that if they go ahead, would fall to the Environment Agency to lead. However, we would input to, and support other actions as required, and where appropriate assist the lead organisation in obtaining Heritage Lottery, Landfill Tax and other funds.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Construct a pumping station at Purfleet to pump from the Mardyke to the Thames during tide-lock, to maintain some river velocity and remove some deoxygenated water. | Environment Agency<br>Developers |  |
| 2. Revoke or review abstraction licences to reduce the demand for summer water resources. | Environment Agency<br>Farmers |  |
| 3. Reduce the phosphate content of the Upminster Sewage Treatment Works effluent. | Environment Agency<br>Anglian Water Services |  |
| 4. Create channel diversity using deflectors, low level berms and two-stage channels. Construct riffles and mini-weirs to re-oxygenate the water.<br>Re-profile banks to facilitate varied in-channel water levels. | Environment Agency<br>Landowners<br>Havering Council<br>Thurrock council |  |
| 5. Manage bank-side vegetation to increase channel diversity. Cut vegetation in alternate bankside blocks to encourage channel narrowing and | Environment Agency<br>Landowners<br>Thames Chase<br>Thurrock Council |  |

| | | |
|---|---|---|
| meandering. | Havering Council | |
| 6. Recreate flood meadows for habitat and winter storage by encouraging winter flooding of land near Grangewaters Country Park. | Environment Agency<br>Landowners |  |

## Issue 3: Failure to achieve water quality and biological targets at a number of sites in the area.

*Contact:* *Steve Bewers & Julia Stansfield*

**Background**

The Water Quality Objective scheme enables quality targets to be set according to the use to which the watercourse is put e.g. fisheries, public water supply. This ensures that there is no deterioration in quality and provides an agreed planning framework for both regulatory bodies and dischargers. The River Ecosytem (RE) classification scheme is used for setting chemical targets for water quality. The classes range from RE1 to RE5, each one having standards set for the following parameters, dissolved oxygen, biochemical oxygen demand (BOD), ammonia, unionised ammonia, pH, dissolved copper and total zinc. In addition to the chemical scheme, a biological target is also set for each RE grade.

A review of compliance against the chemical RE targets has identified those sites where there is a significant failure for one or more parameter. An assessment of compliance with the biological targets at these failing sites was also undertaken. The sites are listed in Table 5 below.

The reason for the failures needs to be investigated by undertaking a series of investigations including detailed data analysis and field inspections. At some sites an obvious cause, such as point source pollution, may be identified against which action can be taken. At others the failure may be attributable to natural factors, such as dissolved oxygen failures caused by slow flowing watercourses with little re-aeration occurring.

**Table 5.** Sites identified as requiring further investigation.

| River name (major river catchment) | Stretch From ...To | Length (km) | RE target | Failing chemical parameters | Biology failures |
|---|---|---|---|---|---|
| River Crouch | Outwood Common to Nevendon Brook | 5 | 4 | None | Yes |
| Goldsands Brook (Crouch) | Southminster STW to River Crouch | 5 | 4 | Dissolved oxygen | No |
| Prittle Brook | Headwaters to tidal limit | 11 | 3 | None | Yes |
| Rayleigh Brook (Roach) | Rayleigh East STW to Eastwood Brook | 6 | 4 | Ammonia | No |
| Eastwood Brook (Roach) | Headwaters to Southend Airport | 6.5 | 2 | None | Yes |

| | | | | | |
|---|---|---|---|---|---|
| Eastwood Brook (Roach) | Southend Airport to Rayleigh Brook | 1 | 2 | None | Yes |
| Eastwood Brook (Roach) | Rayleigh Brook to Roach | 1 | 3 | Ammonia and unionised ammonia | No |
| Rochford Reservoir (Roach) | Rochford Reservoir | 0 | 3 | Ammonia and unionised ammonia | Yes |
| Mardyke | Aveley tributary to TBM intake | 2 | 3 | Dissolved oxygen | No |
| Mardyke | TBM intake to Sluice | 2 | 3 | Dissolved oxygen | No |

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Undertake a programme of investigations to determine the cause of water quality and biological failures. | Environment Agency |  |
| 2. Following the investigations, produce and implement an action plan detailing activities required to improve compliance for each river stretch. | Environment Agency (Others may include Industry, Anglian Water Services, farmers etc) |  |

**Issue 4: Failure to meet River Ecosystem Class 3 for dissolved oxygen in the Lower Mardyke.**

*Contact:* *Mike Webley & Paul Ward.*

**Background**

High concentrations of nutrients and low flows have led to low levels of dissolved oxygen in the Mardyke from Stifford Bridge to Mardyke Sluice. Inorganic plant nutrients, principally nitrates and phosphates, reach watercourses from point sources, such as discharges from sewage treatment works and diffuse sources, for example, run off from agricultural land. Phosphates are usually the limiting nutrient in freshwater systems. Over-enrichment of the Mardyke by these have led to eutrophic conditions during the summer with extensive growth of duckweed in the lower reaches, creating a blanketing effect that reduces the concentration of dissolved oxygen. This is exacerbated by low flows in the summer and has led to a long-term failure to meet the River Ecosystem Class 3 target for dissolved oxygen.

Consultants for the Agency undertook the Mardyke Feasibility Study in February 1999. This concluded that improvements in dissolved oxygen levels are unlikely to be achieved through changes to river flow, since water quality appears to be dictated by nutrient inputs, particularly phosphates.

Upminster Sewage Treatment Works (STW) contributes a significant loading of phosphorus to the Mardyke. It has been estimated that the STW contributes 96% of the phosphorus loading from point source discharges in the river catchment. The STWs has a significant effect on the river, increasing the concentration of phosphorus to an average 3.32mg/l downstream of the discharge compared to 0.42mg/l upstream (1998 data).

The Urban Waste Water Treatment Directive permits the designation of Sensitive Areas (Eutrophic) where watercourses exhibit signs of eutrophication and are downstream of sewage treatment works serving a population of greater than 10,000. The Mardyke will be put forward as a candidate Sensitive Area (Eutrophic) under the review of designations in 2001. If the Mardyke is approved for designation by the DETR, phosphorus reduction must be undertaken at Upminster STW (the only STW serving a population greater than 10,000) to meet a standard of 2mg/l within seven years of designation.

As part of the Dolphin Quarry redevelopment, a new pumping station is to be built at Mardyke Sluice to pump water over the sluice at times of high flow when the sluice is tide-locked. The pumping station will be adopted and operated by the Agency. The Mardyke Feasibility Study proposed that this could be used to remove deoxygenated water from the lower Mardyke and may be effective at raising the dissolved oxygen levels. A study needs to be undertaken to ascertain whether there will be any improvements to water quality by changing the flow in the lower Mardyke by the careful operation of the pumping station, without compromising water levels.

An alternative method of elevating dissolved oxygen levels would be to remove the duckweed, which causes the blanketing effect on the river. A method of removing the weed has not been established yet because of its small size hindering mechanical removal. Methods of duckweed removal need to be developed and possibly used to control weed growth on the lower reaches of the Mardyke.

There are occasional pollution incidents in the catchment caused by drainage from the highways and urban areas. This can have a significant impact on water quality because it flushes contaminants including oil, organic matter and metals from surface water sewers and roads into the river. The discharges are so dispersed and outfalls so numerous that they can not be controlled successfully by using numeric consents. The environmental impact can be minimised by the use of Best Management Practices. The use of these will be encouraged through the planning process for new developments. The impact of the existing infrastructure on the receiving watercourse needs to be assessed, however, through surveys of significant outfalls.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Submit the Mardyke as a candidate Sensitive Area (Eutrophic) under the review of designations in 2001 | Environment Agency |  |
| 2. Undertake an investigation to assess the relative contribution of diffuse source inputs of phosphorus compared to point source inputs, and relate this to the concentration of phosphorus that is critical for duckweed growth. | Environment Agency |  |
| 3. Consider the pumping regime of the new pumping station at the Mardyke sluice to ascertain whether marginal changes in river flow will increase dissolved oxygen levels. | Environment Agency |  |
| 4. Develop a method for duckweed removal from watercourses, and possibly implement weed control on the lower Mardyke reaches. | Environment Agency |  |

| | | |
|---|---|---|
| 5. Investigate the quantity, quality and impact of urban and highway drainage in the catchment. Identify impact reduction methods e.g. dredging to remove organic sediments; Best Management Practices, and good liaison with the Highways Agency. | Environment Agency<br>Highways Agency |  |

## Issue 5: Concern about rising groundwater levels.

*Contact:* *Graham Robertson*

**Background**

Chalk groundwater levels are rising in some parts of the area, due primarily to the cessation of pumping from a number of large abstractions during the 1970's.

Chalk groundwater generally flows in a south-easterly direction, with groundwater heads lowering from +10m AODN in the west to –20m AODN in the south east.

At Rayleigh and Burnham, chalk groundwater levels are recovering at a rate of 600 mm/year due to the cessation of public water supply pumping from the chalk at these localities. The chalk aquifer is, however, well confined by the London Clay, and therefore no problems are envisaged with the continuing rise in groundwater levels at these locations.

At Thurrock, the chalk is unconfined and is found either at or close to ground surface. Over much of the past sixty years, the chalk has been quarried commercially and the quarried areas de-watered during their working phases. De-watering activities have now ceased which has led to localised rises in groundwater levels of approximately 60 mm/year. It is possible that continued rises in groundwater levels around Thurrock could cause localised flooding or structural problems to low lying developments, particularly if those developments are sited on or close to former quarries where the restored ground surface level is lower than the original (natural) ground level.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Continue to closely monitor groundwater levels, utilising the existing groundwater level observation network, in order to provide localised level information and advice to local authorities and the general public. | Environment Agency |  |
| 2. Investigate methods of stabilising groundwater levels in target areas by controlled pumping, with potential for resulting discharges being utilised for augmenting low summer flows in the Mardyke. | Environment Agency |  |

| | | |
|---|---|---|
| 3. Carry out a study to look at the potential for amending current water abstraction policy in the localities where rising groundwater levels present a potential problem to existing developments. Consideration to be given to aquifer modelling as an effective management tool. | Environment Agency – both Anglian and Thames Regions |  |

**Issue 6: Concern over the water availability with regard to future housing requirements.**

*Contact: Graham Robertson.*

**Background**

Public water supplies are provided by Essex and Suffolk Water Plc.

Demand for water within south Essex is forecast to grow over the next 10 years.

Currently, the natural water resource within the company's boundaries is only capable of providing half of the current demand from the population supplied. The other half is provided through imports of water via the Ely Ouse to Essex water transfer scheme and through bulk transfers from the neighbouring Thames Water Utilities. Groundwater resources are also fully committed to meeting the demands of existing users.

Demand for water is assessed by reference to the predicted changes in population and consumption habits, as well as considering the potential for demand management practices, such as leakage control and metering policies. Other demands such as those associated with industrial or agricultural growth, are also allowed for.

Future increases in demand will have to be met through alternative supplies from outside of the area. In the short term, the Water Company are looking to treat and re-cycle waste water and transfer this via the river channel to Hanningfield Reservoir coupled with stricter demand management. An application to treat, discharge and re-abstract this additional resource has recently been submitted to the Agency by the Water Company.

In the longer term, Essex and Suffolk Water are also investigating:

a. The option of raising the storage capacity of the Abberton Reservoir, (new storage reservoir in association with the Ely Ouse to Essex transfer scheme).

b. Pumping excess winter surface water into the chalk aquifer for recovery at times of peak demand and drought.

c. And also Rising London Goundwater
Bulk Supplies
Desalination

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. The Agency will continue to focus Essex & Suffolk Water on demand management and leakage control initiatives prior to considering any future water resource schemes. | Environment Agency<br>Essex & Suffolk Water |  |
| 2. The Agency will continue to provide information and advice to educate people on how to make better use of their water supplies. | Environment Agency<br>Essex & Suffolk Water |  |

## Issue 7: Water resource availability for spray irrigation of crops.

*Contact:* *Graham Robertson*

**Background**

Essex is the driest county in England with potential evaporation actually equalling or even exceeding annual rainfall totals over much of the coastal strip. The soils of the coastal strip are light and suitable for growing root crops such as potatoes, sugar beet and carrots. These crops have a demand for water that cannot be met without irrigation, as high soil moisture deficits develop naturally every summer due to the imbalance of seasonal rainfall and evaporation.

Currently, groundwater and summer surface water resources are fully committed to meeting the needs of existing licence holders and the water environment.

The Agency promotes the use of winter stored water as a sensible use of resources particularly for agriculture. However, much of the south Essex coastal fringe has been designated as either candidate Special Areas of Conservation (cSACs) under the EC Habitats Directive or Special Protection Areas (SPAs) under the EC Wild Birds Directive. Both of these designations offer the highest form of protection to these habitats and to the species that inhabit them.

The Agency has special responsibilities to safeguard these sites when planning its own work or when considering the actions of others in the form of consents/licences. Given the present state of knowledge it can be difficult to predict the impact of changes in water levels or freshwater outflows on particular species or habitats. An Agency led research project recently found a strong statistical link between the distribution of over-wintering wildfowl and the absence/presence of freshwater streams feeding inter-tidal creeks in SPAs. As a result of this initial research, the Agency has been discouraging licence applications for winter water in these areas. Current research is attempting to establish the reasons for this link. It is therefore likely that in future, those parties considering the abstraction of winter water in these localities, will have to provide adequate information in the form of Environmental Impact Appraisals. This will enable us to make an assessment as to whether the proposal is likely to impact upon the conservation objectives of these sites.

We also have a statutory requirement to review all existing authorisations which might already affect the conservation objectives of any designated cSAC or SPA, and either affirm, modify or revoke them. This requirement has specific implications for existing water abstraction licences, Integrated Pollution Control authorisations, discharge consents and waste management licences.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Investigate the use of dilute effluent for irrigation of crops. | Environment Agency<br>Anglian Water Services<br>National Farmers Union |  |
| 2. The Agency will continue to provide information and advice to educate people on how to make better use of their water supplies. | Environment Agency<br>Essex & Suffolk Water |  |

## Issue 8: Fly-Tipping

*Contact:* *Tim Sheppard.*

**Background**

Fly-tipping is the illegal disposal of waste at unauthorised sites by both businesses and the public. It is a particularly anti-social activity, defacing the environment, causing a risk to the public and requiring someone else to pay for it to be cleared. The cost of disposing of waste correctly has increased significantly due to operators having to comply with ever more onerous environmental controls and also fiscal measures such as the landfill tax. Additionally there is an increased difficulty in finding authorised sites that are both permitted and willing to accept wastes.

The nature of fly-tipping is such that it tends to happen in unobserved places, often under cover of darkness. Agricultural land is particularly attractive to the fly-tipper in that there are many locations such as field gateways off small lanes where the risk of being caught is low.

The Fly-tipping Stakeholders Forum is a partnership between the Agency and several other organisations that have produced a guide to help combat the problem. There is also a matrix that distinguishes broadly between matters that are the Agency's responsibility and those of the local authority, with respect to investigation and clearance. The Agency will generally arrange clearance for wastes deposited in water or in locations where there is a high pollution risk. The local authority will clear other waste from public land. The landowner is otherwise responsible for clearing waste from their land and farmers are therefore especially vulnerable.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Work with local authorities to deter fly-tipping at blackspots. | Environment Agency<br>Local Authorities |  |
| 2. Give advice to landowners to make their property less inviting for fly-tippers. | Environment Agency<br>Country Landowners Association,<br>Local Authorities. |  |
| 3. Encourage courts to give stricter and more consistent fines. | Environment Agency<br>Essex & Suffolk Water |  |

## Issue 9: Awareness and support of fisheries issues within the Thames Estuary Partnership Action Plan.

*Contact:* *Ros Wright*

**Background**

The Thames Estuary now supports a number of important fisheries both recreational and commercial. Fisheries management of the Estuary is a complex issue as three Regions of the Environment Agency, CEFAS and Kent and Essex Sea Fisheries Committee are involved in fisheries regulation. Thames Region is leading this initiative on behalf of the Environment Agency. A Thames Estuary Management Plan was drawn up in 1996, identifying several fisheries issues and recommendations. These included improvement of co-ordinated regulation of fisheries in order to better protect and promote the resource while permitting sustainable exploitation. The need for a more comprehensive fish survey programme was also recommended, in particular to identify spawning and nursery areas of various fish species and to develop a management strategy for rare species such as twaite shad and smelt.

We will support the initiatives designed in the Tidal Thames Sea Fisheries Action Plan by the Thames Estuary Partnership. Thames Region leads on this Issue but Anglian Region supports them strongly.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Improve and co-ordinate the regulation of fisheries within the estuary to better protect and promote the resource, while permitting sustainable development. | Environment Agency – (Anglian, Thames & Southern) Kent & Essex Sea Fisheries Committee, CEFAS |  |
| 2. Monitor and conserve the allis and twaite shad as in the Biodiversity Action Plan for these species. | Environment Agency – (Anglian, Thames & Southern) Kent & Essex Sea Fisheries Committee, CEFAS. |  |
| 3. Work to reduce the introduction and impact of alien species. | Environment Agency – (Anglian, Thames & Southern) Local Authorities |  |
| 4. Recognise the migratory nature of fish in the estuary, and seek further information. | Environment Agency – (Anglian, Thames and Southern) |  |
| 5. Promote the nursery status of the estuary in both fisheries regulation, in wider management, and increase existing knowledge. | Environment Agency – (Anglian, Thames & Southern) Kent & Essex Sea Fisheries Committee, CEFAS. |  |

## Issue 10: The Blue Flag Award for the Southend-on-Sea Bathing Beach

*Contact:* *Patrick Ripton*

**Background**

At Shoebury, Thorpe Bay and Westcliff Bay at Southend-on-Sea, bathing waters have been designated under the EC Bathing Waters Directive. At these locations, water quality is monitored by our Thames Region.

The main influence on water quality is the sewage effluent discharged from Southend Sewage Treatment works into the deep-water channel beyond Southend Pier. Anglian of sewage aimed at improving water quality to better than the mandatory standards, which are currently achieved, up to the guideline quality which is a prerequisite for the European Blue Flag award. This was done at Shoebury in 1997 but has so far proved illusive at the others, despite the treatment provided.

A parallel investment has also been made in sewerage to eliminate premature and uncontrolled storm or untreated discharges. There has been intermittent occurrence of samples above the guide value and a detailed investigation into residual sewerage to identify any defects that may have been the cause of the problem. It is understood that results in 1999 bathing season have met the mandatory but not the Guide standard, so qualification for these Blue Flag Awards are at risk.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. We will work with Anglian Water Services as far as practicable to identify and eliminate causes of contamination. | Environment Agency<br>Anglian Water Services<br>Southend-on-Sea Council |  |

## Issue 11: Contamination from waste disposal sites in shoreline locations.

*Contact:* *Patrick Ripton.*

**Background**

For decades, the community has disposed of waste products by depositing them on low land adjacent to rivers and estuaries. This was deemed advantageous because high ground could be created above flood level and used for commercial purposes.

Disadvantages of this strategy have become apparent. Shoreline erosion has exposed degraded waste on some former tipped land e.g. at Tilbury. This has resulted in rapid erosion, litter on the foreshore and the further destabilisation by collectors digging the exposed material to search for collectable bottles etc. If unchecked, the resulting erosion will ultimately create weak links between the adjacent flood defences.

At Two Tree Island near Leigh-on-Sea, waste was used to fill low-lying land bordered by low seawalls, which were not economic to maintain. An island of high ground was created and this now forms a nature reserve. Erosion of the former clay seawalls threatens release of relatively recently deposited waste and leachate. Though not a major hazard, there is potential for nuisance.

Sometimes waste was used to construct floodbanks which themselves allowed commercial use of the former flood prone land; examples include Hadleigh Marsh and South Fambridge. There have been reports of leachate seeping into adjacent landward freshwater borrow ditches, but to date these have been overcome without causing ecological damage. Construction of refuse filled seawalls has ceased because of the effects of a catastrophic failure. Under such a scenario, non-degraded refuse would create serious ecological and aesthetic impacts.

At times of high water, the clay and soil covering to waste deposits can fail, causing penetration of water followed by leaching of contaminates and compromising of the structural integrity of the deposits.

Frontages are under the ownership and maintenance of many organisations and several public bodies, but notably the Environment Agency and Essex County Council. Shoreline management strategies may require dismantling of some of these refuse filled sites in order to ensure a long term sustainable coastline. So for avoidance of environmental pollution and to promote shoreline stability, these former refuse sites need special attention.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Identify each site's current environmental risks and agree maintenance programmes. | Environment Agency<br>Site Operators<br>Landowners<br>Essex County Council |  |
| 2. Classify each site in terms of its long-term sustainability, then prepare appropriate action plans. | Environment Agency<br>Site Operators<br>Landowners<br>Essex County Council |  |

## Issue 12: Potential impact of climate change on sea levels and coastal protection.

*Contact:* *Keith Tyrell.*

**Background**

The predicted sea level rise has implications for the coastal protection in South Essex. The future planning of sea defences needs to take account of possible sea level rise. An allowance is built into all sea defence designs to allow for future sea level rise. Under natural circumstances coastal habitats would migrate landward as the level of the sea rises, however this migration is prevented in the most part by seawalls. As a consequence, many habitats are subject to 'coastal squeeze' and are diminishing at a significant rate. Due to the extent of cSAC's and SPA's around the coast, many coastal defence schemes and strategies will need to take into consideration the requirements of the Habitats and Birds Directives (which have been transported into UK law through the Conservation Regulations (SI12716)).

CHaMPs (Coastal Habitat Management Plans) have been developed by the Agency and English Nature to ensure coastal defence schemes and strategies are compliant with the Habitats Directive.
In developing these plans, it is important to recognise that South Essex coastline could be significantly affected by changes made to the Kent shoreline and vice-versa. Anglian Region therefore, works with its Southern and Thames Regions to seek optimum balance in these plans.

The Ministry of Agriculture, Fisheries and Food (MAFF) has made a commitment to fund schemes that protect European Habitats and Birds Directive sites, or where necessary, provide compensatory habitat. Furthermore, the European Commission has confirmed that it will fund a joint Agency/English Nature project that will help the Agency deliver coastal defence schemes in this way. The plans will take a 50 year view of coastal change and will identify the conservation measures that will be necessary for Shoreline Management Plans to comply with the Habitats and Birds Directives. Sites of international importance for nature conservation on the coast are Dengie, the Crouch and Roach estuaries, Foulness, Benfleet and Southend Marshes and Mucking Flats and Marshes.

| Proposed Activities | Potential Partners | Environmental Themes |
|---|---|---|
| 1. Where appropriate, ensure sustainable protection of habitats designated under the Habitats Directive and in line with guidance given in the Shoreline Management Plan, the Essex Seawall Strategy and the forthcoming ChaMP. | Environment Agency<br>Maritime Local Authorities<br>English Nature<br>RSPB |  |
| 2. Classify each site in terms of its long-term sustainability, then prepare appropriate action plans. | Environment Agency<br>Maritime Local Authorities<br>English Nature<br>RSPB |  |

# 4.0 Protection through Partnership

## 4.1 Introduction

The 'Protection Through Partnership' section provides the opportunity to address longer-term management issues in partnership with others. It looks at how the Agency can work with others for the benefit of the local environment. The timescales for action will depend upon our ability to work effectively with other groups, and requires a commitment from all to improve the environment.

The partnership approach is an underlying theme of the LEAP process because, although the Agency operates within an extensive regulatory framework, it is recognised that it has very little control over the mechanisms that determine land use change and, hence, pressures on the environment on a catchment-wide basis. In addition, it must be remembered that LEAPs are non-statutory documents. In order for their policies and actions to be effective, they therefore need to be incorporated into statutory documents, such as Structure Plans and Local Plans.

We are currently involved in many projects and activities that rely on partnerships. Close links are already established with local authorities, water companies, industry, angling clubs, conservation bodies, port authorities, recreation and landscape bodies. New partnerships will be sought, both with these organisations and with others. It is hoped that joint funding initiatives and joint ownership of projects will provide a more secure basis for environmental protection.

Many other partnerships occur or are planned within the Agency, all of which are designed to deliver the mutual objectives of the partners involved. We have a diverse network of relationships with many national, regional and local organisations as well as landowners and the public. One significant area for future development will be the building of partnerships to aid environmental education. It is through these partnerships that we are able to fully contribute towards the goal of sustainable development.

This Section outlines some of the partnerships that are occurring, or are planned, within south Essex.

## 4.2 Improving Air Quality

**Air Quality Management.**

*Agency Contact: Victor Whiteley*

*Partners: Local authorities*

The responsibility for implementing the Government's National Air Quality Strategy at a local level has been given to Local Authorities. Air Quality Management Areas will be created by the local authority where air quality standards are not being met, and Action Plans will be drawn up to improve the situation.

The main responsibility for managing air quality for the regulation of smaller industrial processes and for reducing traffic pollution is with local authorities. However, the Agency has a direct responsibility with respect to air quality through the system of Integrated Pollution Control (IPC) which is used to regulate the most potentially polluting industrial processes.

The Agency will work with local authorities to clarify responsibilities for implementing the National Air Quality Strategy and to provide relevant information where appropriate. Agency-driven improvements need to complement local authority air quality objectives. A local air quality strategy for Agency regulated processes would allow us, when formally consulted by local authorities, to

contribute to local air quality plans. The Agency will also assess current monitoring programmes for our regulated processes in the light of their impact on local air quality.

### 4.3 Managing Waste

**Strategic Waste Planning**

*Agency Contact: Michael Guthrie*

*Partners: local authorities*

The Agency inherited the charge of provision of data on waste disposal to the Regional Planning Fora from the former Waste Regulation Authorities. This involves the collection and collation of information on the types and quantities of waste going to waste facilities in a given region, and the on going demand for waste management capacity.

**Waste Minimisation Schemes**

*Agency Contact: Steve Bewers*

*Partners: Industry, local authorities, Business Link, etc.*

The reduction of waste at source is at the cornerstone of the Agency's waste minimisation policy. It endeavours to achieves this by working directly with government, and in partnership with others, to inform, educate, influence and facilitate measurable reductions in the generation of all types of waste to promote the sustainable use of natural resources.

The Agency offers advice to companies and is actively involved with a number of waste minimisation clubs and partnerships, including the Essex Waste Minimisation Club and the Basildon Green Forum. These forums provide an opportunity for businesses to learn about ways to improve their profitability whilst helping to protect our natural resources. We have been fortunate in securing Landfill Tax support, through Entrust, for work with the Essex Waste Minimisation Club.

But the Agency recognises that education is just one of the mechanisms for reducing waste. It is also necessary to develop markets for recycled materials. To this end the Agency is working with the Essex Market Development Partnership to encourage industry to use recyclates as raw materials, to identify opportunities for using recycled materials in innovative ways and to establish an infrastructure to improve the collection and processing of recyclable municipal waste. This flagship project in the first of its type in England.

In addition, we have developed strong ties with other organisations around the Region including East Anglian Business Environment Club, Business Link, Suffolk Waste Minimisation Partnership, Norfolk Waste Management Partnership and the Government Office - Eastern Region. An example of such co-operative working is the East Anglian Food and Drink Industry Waste Minimisation Project which is promoting waste minimisation in all stages of the food and drink industries, from food production and processing to consumption. The Agency is also actively supporting the Anglian Region Waste Campaign Awareness (Slim Your Bin), which is extending its programme to the workplace during 2000.

**Maximising environmental benefits from Landfill Tax credits.**

*Agency Contact: Sue Innes*

*Partners: Environmental Bodies, ENTRUST*

Landfill Tax is charged to landfill site operators by HM Customs and Excise. Under the Landfill Tax regulations, landfill operators can reclaim some of this tax if they make contributions to approved environmental bodies. The amount reclaimed can be up to 90% of that contribution (subject to a maximum that is 20% of their annual Landfill Tax liability).

An "Environmental Body" can be any organisation whose aim is, or includes, the protection of the environment. It must support one or more of the objectives set out in the Landfill Tax Regulations. The bodies can be established organisations or new ones set up especially to make use of the tax credits. Environmental Bodies must enrol with the regulator (ENTRUST).

At the discretion of the landfill industry, nationally up to £100m per year could be channelled into Environmental Bodies. There is enormous potential for benefits to the environment to be achieved from these funds through collaborative work and partnerships. In relation to the Agency's functions, such projects could include general habitat improvement and restoration schemes, recreation improvements, conservation projects, and waste minimisation initiatives.

## 4.4 Managing our Water Resources

**Development and Water Supply/Water Conservation**

*Agency Contact: Graham Robertson*

*Partners: Water companies, local authorities, developers, landowners, farmers*

The Agency liaises with water companies, in order to manage water resources and to ensure that both demand management and demand forecast plans are appropriate. Within this framework and in conjunction with our abstraction licensing system the Agency regulates the water companies, farmers and other abstractors to achieve the proper balance between the needs of the environment and other water users. Where water resources are fully committed then water could be supplied from elsewhere. However, the full impacts and costs of this will need to be assessed to ensure sustainability. If additional finance, capital, investment or infrastructure are necessary, then these costs will ultimately be borne by the developer and water company customers. It is also vital that development does not proceed ahead of due consideration to social and environmental costs. The Agency will work with the water supply companies and local authority planners to ensure that all costs and implications of development are balanced against the need for sustainable water supplies. We will want sustainable water supplies taken into consideration before development takes place.

The Agency does place great emphasis on demand management especially where this will reduce pressures on the environment or prevent the need for the development of new resources. We encourage measures such as the water company's leakage control and metering programmes and initiatives to build water conservation into new developments, for example through installation of low water-use appliances. We will also work actively to discuss and consider alternative sources of supply, including aquifer storage and recovery, recycling of wastewater as well as desalination.

## 4.5 Delivering Integrated River Basin Management

**Mardyke Feasibility Study** (also see Issue 2)

*Agency Contact: Kate Potter*

*Partners: Countryside Agency, Thames Chase, Thurrock Unitary Authority.*

In August 1998, the Environment Agency and the Countryside Commission (now the Countryside Agency) commissioned a study to identify a range of potential environmental enhancement options for improving the Mardyke and to assess their feasibility. The project was undertaken in consultation with a Steering Group comprising members from the Agency, Countryside Commission, Thames Chase and Thurrock Unitary Authority, all of whom are involved in the management of the Mardyke valley.

The Mardyke lies in an open valley, which is an important landscape of significant local and regional heritage value. The valley has been subject to a long history of change that has contributed to a reduction in habitat diversity and amenity value of both the watercourse and the associated valley. The Mardyke has long suffered from water quality and fisheries failures in its lower reaches. The river is an unusual watercourse in that the only significant source of water is run-off or consented discharges. Additionally the watercourse is tide locked for around 12 hours a day, and this results in very slow flows.

The study identified a number of options for environmental enhancement centred on water quality improvements, habitat and landscape enhancements and recreational and educational strategies. These options are now being progressed by the partners via a number of funding routes including a Heritage Lottery Bid and a landfill tax bid.

**Coastal Protection**

*Agency Contact: Clive Flanders*

*Partners: Local Authorities, Harbour Authorities.*

Within the framework of the Shoreline Management Plan (see Section 2.15), we are continuing to encourage liaison opportunities with the relevant District Councils who have responsibilities for coastal defences under the *Coast Protection Act 1949*. This will ensure that our respective coastal management and sea defence activities are complementary, and do not have any adverse effect on adjacent frontages.

The Environment Agency is also involved in a joint project with English Nature (funded by EU LIFE money) to develop Coastal Habitat Management Plans (CHaMPs). These plans will ensure that future Shoreline Management Plans (SMPs) are compliant with the Habitats Directive.

**Anglian Otters and Rivers Project**

*Agency Contact: Charles Beardall and Kate Potter*

*Partners: Wildlife Trusts, Anglian Water, Essex and Suffolk Water.*

Rivers are one of our greatest natural resources. They once shaped and formed the landscape creating a variety of habitats. Sadly, due to the past management to improve drainage and reduce flooding, many now lack the important features needed to support wetland wildlife.

The Anglian Otters and Rivers Project is working to improve river habitats and restore otters and other wildlife to our rivers. This project is helping to implement the National Otter Biodiversity Action Plan launched in 1998. The Wildlife Trusts and Environment Agency are joint lead partners for the Plan and Water UK is the national champion for the otter.

The Anglian Otters and Rivers Project Officers are working with Agency Officers to implement the Biodiversity Action Plan for the riverine species and habitats the Agency is the lead for. (*See South Essex Environmental Overview for more information).*

**Thames Estuary Partnership (TEP)**

*Partners: Port of London Authority, Local Authorities, English Nature, Universities, RSPB, Wildlife Trusts, MAFF.*

The River Thames downstream of Tower Bridge is subject to '*Management Guidelines for the Thames Estuary*' drawn up by the Thames Estuary Partnership (TEP) in which the Agency is a key partner. This guidance consists of triple set of documents, the Strategy, Principles for Action and the Action Plan. Taken together they effectively fulfil the role of a LEAP for Thames Estuary.

The partnership is also in the process of establishing a Charitable Trust with the principle aim of attracting funding for Action Plan implementation. Potential funding for issues of estuary wide importance will be of mutual benefit to both management areas particularly to fill gaps in current knowledge in the research fields identified for hydraulic modelling, fisheries, water quality management and preservation of archaeological heritage, for example. The timing of both management plans has presented a unique opportunity for partnership working to ensure effective management of these issues.

## 4.6 Conserving the Land

**Development**

*Agency Contact: Jenni Hodgson*

*Partners: local authorities*

The Agency is a statutory consultee in the development plan process. We use this to promote sustainable development at a local level, and aim to get policies for protection of the natural environment into statutory plans. County and Local Authority planners seek Agency advice on water resources, flood risk, waste, water quality and air quality to enable them to sustainably allocate new developments.

As a statutory consultee under Town and Country Planning legislation, the Agency seeks to ensure that local planning authorities are aware of the environmental implications of an individual development when deciding on whether to grant planning permission. In some cases we will ask the local planning authority to impose conditions on a development, to ensure that impacts on the environment are acceptable. We will endeavour to work with the relevant local authorities to ensure that any development is sensitive to the needs of the local environment.

Under Section 105 of the Water Resources Act 1991, the Agency has a duty to produce maps of flood risk areas for use by local authorities in their development plans to prevent inappropriate development in the floodplain. Priority areas within the LEAP are the coastal and tidal frontages and developed land along 'main river'. There is still a large amount of survey work to be completed. Each river valley needs to be surveyed with full, detailed hydrometric mapping taking place.

**Contaminated land**

*Agency Contact: Simon Wood*

*Partners: local authorities, landowners*

If land is contaminated by harmful substances, it may pose a risk to human health, surface and ground water, ecosystems, man-made structures and services, and land use. The extent and nature of land contamination in any area is a legacy of its industrial and urban development. Urban areas generate the most solid waste, most of which has been, and is still, disposed to landfill sites. Past industrial and waste disposal practices were subject to fewer controls than at present, and land contamination has also occurred through accidental spillage and casual disposal practices.

One of the Agency's principle aims is to "secure, in co-operation with others, the remediation of contaminated land". We recognise that this can only be achieved by working in close partnership with local authorities. Section 57 of the Environment Act 1995, once implemented, will provide new powers and responsibilities for local authorities and the Agency regarding the identification and remediation of sites which meet the statutory definition of contaminated land. Until such time, the extent and nature of contaminated land in South Essex cannot be comprehensively determined from existing sources of information. The redevelopment of such land is currently addressed through the planning process and the guidance contained in PPG23.

## 4.7 Managing our Freshwater Fisheries

**Fisheries Enhancement Projects**

*Agency Contact: Ros Wright*

*Partners: Angling Clubs, Fisheries Owners, Local Authorities, Essex Wildlife Trust, CEFAS.*

The Agency makes every effort to ensure that good quality fisheries management advice is always available and provides assistance where possible in the design and implementation of management actions or schemes. The extent of the Agency's involvement is variable and ranges from straightforward verbal advice to practical assistance with fish removals and transfers for the benefit of angling clubs or public fisheries. However, it is not always possible to pursue opportunities for fishery enhancement in stillwaters because of the large number of cases that arise and the limitations of our resources.

Fish deaths are investigated in rivers and still waters and disease outbreaks are monitored in liaison with CEFAS and the Agency's National Fisheries Laboratory at Brampton and appropriate advice given.

The Mardyke is the only major freshwater river in south Essex and the enhancements identified in the Mardyke Feasibility Study may be of benefit to fish stocks throughout the river.

## 4.8 Enhancing Biodiversity

### Essex Biodiversity Plan

*Agency Contact: Kate Potter*

*Partners: Local authorities, English Nature, Wildlife Trust, NGOs.*

As part of the Environment Agency's input into Local Agenda 21 (LA21) we are part of the Anglian Regional Biodiversity group aimed at translating the national initiative of biodiversity into a Regional context.

At a local level, local authorities and environmental organisations, including the Environment Agency, have compiled the Essex Biodiversity Action Plan (BAP) with specific targets for species and habitats, many of which are relevant. We are in a key position to influence many of the BAP targets as they relate to coastal habitats, wetlands and aquatic species (e.g. crayfish, water vole, reedbed and saltmarsh). As such, the Agency is playing an active role in the production of the Biodiversity Action Plan and taking on specific responsibility to progress Action Plans for key species and habitats. We have undertaken water vole surveys in partnership with the Essex Wildlife Trust and are resurveying the extent of saltmarsh in Essex in collaboration with English Nature.

The conservation of biodiversity will be a key indicator of the successful implementation of sustainable development.

Further research is needed into the requirements of key species in order to progress these plans.

### Conservation Enhancement Projects

*Agency Contact: Kate Potter*

*Partners: Essex Wildlife Trust, English Nature, landowners, others.*

The Agency's external promotion of conservation involves collaborating with others. This partnership approach makes a real difference on the ground and provides value for money for the Agency and the organisations with which we collaborate. Some examples of collaborative projects undertaken in South Essex include:

At Fobbing Marshes, we undertook work to desilt drainage ditches and install control structures at this SSSI grazing marsh. In partnership with the landowner and English Nature, the work aimed to improve water level control at the site and to improve habitat diversity within the drainage system. These works also formed part of Objective 1 of the Water Level Management Plan (WLMP) for Vange and Fobbing Marshes SSSI.

The Agency also undertook channel works at Grove House Wood Local Nature Reserve at Stanford-le-Hope. At the request of Essex Wildlife Trust, the Agency desilted and reprofiled the channel to increase habitat diversity and improve flows.

## Further Examples

### Local Agenda 21

*Agency Contact: Jenni Hodgson/Vicky Eade*

*Partners: Local authorities*

Local Agenda 21 (LA21) has been adopted to ensure that sustainable development is achieved on a local scale. Within South Essex, LA21 is at varying stages of production although the Government has requested that all local authorities have a plan in place by the year 2000. Our future involvement on these issues will very much depend upon resources available at the time, and the status of LA21 within each of the local authorities.

Because so many LA21 concerns and solutions have their roots in local activities, the participation and co-operation between local authorities and the Agency is of vital importance. We will, where practicable and relevant to our work, provide environmental information and work with others to achieve the objectives of sustainable development. We intend to support and contribute towards LA21 initiatives within South Essex. The LEAP process, positively reinforces the message of building partnerships, emphasising the importance of local action and assisting with achieving a greater sense of continuity.

### Environmental Education

*Agency Contact: Nicole Ashdown*

*Partners: Business, Industry, local authorities, schools, Essex Wildlife Trust, Essex Environmental Education Forum, Essex Education Business Partnerships, Field Study Centres, Tilbury Environmental Education Centre, SATRO, others*

Environmental education is a central means of furthering our commitment to sustainable development. Education offers people the potential to address environmental issues, which is vital to achieving a sustainable society. Education in its broadest sense means personal awareness, experience and interest developed over a period of time, whether at home, school, college or university, at work, or in the wider community.

The Agency considers environmental education to be vital and we are actively developing an education service to help schools and colleges at all levels of the curriculum. We encourage local liaison and project-related work in the environment and provide several resource packs and data sets for students to use within their studies. For instance, we have recently distributed a CD-ROM package to a wide selection of Junior Schools in the Anglian Region, called 'Greener Futures'. This package forms a 'Lifestyles and Environmental Audit' project with questionnaires and an extended interactive environment, including various games and tasks. This package was created in partnership by the Environment Agency, Cambridgeshire County Council, the DETR and Peterborough Environmental City Trust.

We are also involved, and actively supporting, the 'Eco-Schools award scheme' which enables schools to extend environmental lessons outside the classroom and apply them to the day-to-day running of the schools. The Eco-Schools award scheme can help schools to: improve the school environment; reduce litter and waste; reduce fuel and water bills; increase environmental awareness; involve the local community; gain business sponsorship; gain local publicity; and, create links with other schools in the UK and Europe.

Another award scheme to be launched in Essex in by the end of year 2000 is the CREST (CREativity in Science and Technology) Awards Scheme which is primarily aimed at secondary schools and colleges both for curricular and non-curricular project work. The scheme provides an opportunity for students to gain recognition for their work and has four levels of achievement; bronze, silver, gold and platinum reflecting increasing levels and depths of input. The Network of Science and Technology Regional Organisations (SATRO) manage and organise the scheme. The latest programme available in the CREST Awards Scheme is the Environmental Research Challenge which is sponsored by three partners (the Environment Agency, the Natural Environment Research Council and Unilever plc) who all have an intrinsic interest in sustainable development.

It is also part of our routine business to promote environmental education in other sectors of society, including business and industry, local authorities and other key players. The LEAP process positively contributes towards education in a fundamental way. The Agency also undertake pollution prevention visits, attends road shows, science fairs, provide speakers, distribute educational documents, and generally work in a pro-active way to protect the environment.

## Appendix A: Duties, Powers and Interests of the Environment Agency

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of our work is advisory, with the relevant powers resting with other bodies such as Local Planning Authorities, for example we are not responsible for: -

- noise problems (except if it is to do with our work)
- litter (unless it is restricting the flow of a river)
- air pollution arising from vehicles, household areas, small businesses and small industry
- collecting waste in your local area
- planning permission
- environmental health
- food hygiene

These are all dealt with by your local planning authority who will contact us if necessary.

We are not responsible for the quality or supply of drinking water at the tap or for treating sewage waste, although we regulate discharges from sewers and sewage treatment works.

The following table is a simplified summary of our duties, powers and interests and their relationship to land-use planning.

| **Water Resources:** The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources. | | |
|---|---|---|
| **The Agency has powers to:** | **The Agency has an interest (but no powers) in:** | **Partnership** |
| • Grant or vary water abstraction and impoundment licences on application.<br>• Revoke or vary existing licences to reinstate flows or levels to surface-waters or groundwater which have become unacceptably depleted as a result of abstraction, and are subject to a liability for compensation.<br>• Secure the proper use of water resources through its role in water-resources planning, the assessment of reasonable need for abstractions and promotion of more efficient use of water resources.<br>• Monitor and enforce abstraction and impoundment licence conditions. | • The more efficient use of water by water companies, developers industry, agriculture and the public and the introduction of water-efficiency measures and suitable design and layout of the infrastructure. | The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water. The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the promotion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water-conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development. |
| **Flood Defence:** The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment. | | |
| • Control, through Land Drainage consents, development or construction of a structure that would affect the flow of an ordinary watercourse (Water Resources Act, 1991 Section 109, Land Drainage Act, 1991 Section 23).<br>• Produce flood risk maps for all main rivers under S105 of Water Resources Act 1991.<br>• Undertake works to main rivers using permissive powers.<br>• Issue flood warning relating to main river to the public, local authorities and the police.<br>• Consent mineral workings within 16 metres of main rivers. | •Granting of planning permission throughout a catchment but especially floodplains where development can significantly increase flood risk. This permission is granted by Local Planning Authorities.<br>•Installation of surface water source control measures e.g. flood attenuation structures.<br>•Supervising the maintenance of ordinary watercourses which is a Local Authority remit, but may impact on main rivers.<br>•Installation of buffer zones which reduce flood risk and have significant environmental benefits.<br>•Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance. | As a statutory consultee on planning applications within main-river floodplains, the Agency offers advice based on knowledge of flood risk. It also advises on the environmental impacts or proposed floodplain development.<br>The Agency will encourage best practice, including source-control measures and common standards, among Local Authorities and riparian owners to protect and enhance the environment.<br>The Agency works with the civil authorities to prepare flood-warning dissemination plans and supports their endeavours to protect communities at risk. |

| | | |
|---|---|---|
| **Water Quality:** The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution. | | |
| • Issue discharge consents to control pollution loads in controlled waters.<br>•Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharges consents.<br>•Prosecute polluters and recover the costs of clean-up operations. | • The control of runoff from roads and highways. This is a Highway Agency duty.<br>•_The greater use of source-control measures to reduce pollution by surface-water runoff.<br>• Prevention and education campaigns to reduce pollution incidents. | The Agency will liase with Local Authorities, developers, the Highways Agency, industry and agriculture to promote pollution prevention and the adoption of source-control measures As a statutory consultee on planning applications, the Agency will advise Local Planning Authorities on the water-quality impact of proposed developments. |
| **Air Quality:** The Agency has a duty to implement Part I of the Environment Protection Act 1990. | | |
| •Regulate the largest technically-complex and potentially most polluting prescribed industrial processes such as refineries, chemical works and power stations including enforcement of, and guidance on, BATNEEC and BPEO.<br>•Have regard to the government's National Air Quality Strategy when setting standards for the releases to air from industrial processes. | • The vast number of smaller industrial processes which are controlled by Local Authorities.<br>•_Control over vehicular emissions and transport planning. | The Agency provides data on IPC processes and advice on planning applications to Local Authorities. The Agency is willing to offer its technical experience to Local Authorities on the control of air pollution<br>The Agency wishes to liase with Local Authorities in the production of their Air Quality Management Plans.<br>The Agency will advise and contribute to the government's National Air Quality Strategy |
| **Radioactive Substances:** The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radio-active materials and the disposal of radioactive waste. | | |
| • To issue certificates to users of radio-active materials and disposers of radio-active waste, with an overall objective of protecting members of the public. | • The health effects of radiation. | The Agency will work with users of the radio-active materials to ensure that radioactive wastes are not unnecessarily created, and that they are safely and appropriately disposed of. The Agency will work with MAFF to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain.<br>The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites.<br>The Agency will work with the HSE on worker-protection issues at non-nuclear sites. |
| **Waste Management:** The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities. | | |
| •Vary waste management licence conditions.<br>•Suspended and revoke licences.<br>•Investigate and prosecute illegal waste management operations | .•The siting and granting of planning permission for waste management facilities. This is conducted by the waste industry and Local Planning Authorities. The Agency, as a statutory consultee on planning applications, can advise on such matters. | The Agency will work with waste producers, the waste-management industry and local authorities to reduce the amount of waste produced, increase reuse and recycling and improve standards of disposal. |
| **Contaminated Land:** The Agency has a duty to develop an integrated approach to the prevention and control of land contamination ensuring that remediation is proportionate to risks and cost-effective in terms of the economy and environment. | | |
| • Regulate the remediation of contaminated land designated as special sites.<br>•Prevent future land contamination by means of its IPC, Water Quality and other statutory powers.<br>• Report on the state of contaminated land. | •Securing with others, including Local Authorities, landowners and developers, the safe remediation of contaminated land. | The Agency supports land remediation and will promote this with developers and Local Authorities and other stakeholders. |
| **Conservation:** The Agency will further conservation, wherever possible, when carrying out water-management functions; have regard to conservation when carrying out pollution-control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment. | | |
| • The Agency has no direct conservation powers, but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation. | • The conservation impacts of new development. These are controlled by Local Planning Authorities.<br>• Protection of specific sites or species, which is a function of English Nature. The Agency does, however, provide advice to Local Authorities and developers to | The Agency supports action to sustain or improve natural and man-made assets so that they are made available for the benefit of present and future generations. Many development schemes have significant implications for conservation. |

| | | |
|---|---|---|
| | protect the integrity of such sites or species.<br>• Implementation of the UK Biodiversity Plan for which it is the contact point for 12 species and one habitat. | The Agency will work with developers, Local Authorities, conservation bodies and landowners to conserve and enhance biodiversity. |
| **Landscape:** The Agency will further landscape conservation and enhancement when carrying out water-management functions; have regard to the landscape when carrying out pollution-control functions; and promote the conservation and enhancement of the natural beauty of rivers and associated land. | | |
| • The Agency must further the conservation and enhancement of natural beauty when exercising its water-management powers and have regard to the landscape in exercising its pollution-control powers. | • The landscape impact of new development, particularly within river corridors. This is controlled by Local Planning Authorities. | The Agency produces River Landscape Assessments and Design Guidelines which it uses when working with Local Authorities and developers to conserve and enhance diverse river landscapes. |
| **Archaeology:** The Agency has a duty to consider the impact of all of its regulatory, operational and advising activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate. | | |
| • The Agency must promote its archaeological objectives though the exercise of its water-management and pollution-control powers and duties. | • Direct protection or management of sites or archaeological or heritage interest. This is carried out by LPAs, County Archaeologists and English Heritage. | The Agency will liase with those organisations which have direct control over archaeological and heritage issues to assist in the conservation and enhancement of these interests. |
| **Fisheries:** The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries. | | |
| •Regulate fisheries by a system of licensing.<br>•Make and enforce fisheries bylaws to prevent illegal fishing.<br>•Promote the free passage of fish and consent fish passes.<br>•Monitor fisheries and enforce measures to prevent fish-entrainment in abstractions.<br>•Promote its fisheries duty by means of land-drainage consents, water abstraction applications and discharge applications. | •The determination of planning applications which could affect fisheries. | Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and Local Authorities to protect fisheries. |
| **Recreation:** The Agency has a duty to promote rivers and water space for recreational use. | | |
| • The Agency contributes towards its recreation duty through the exercise of its statutory powers and duties in water management. | • Promotion of water sports. This is carried out by the Sports Council and other sports bodies. | The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organisations to optimise recreational use of the water environment. |
| **Navigation:** The Agency has a duty to maintain and improve navigation, where we are the navigation authority. | | |
| • Maintain river navigation.<br>• Maintain and operate locks and associated weirs and sluices whilst providing access to these sites.<br>• Provide services such as moorings and pump-out facilities.<br>• Maintain navigation by a system of licencing.<br>•Enforce navigation legislation. | • The management and operation of navigations within the region. | The Agency will work with the Broads Authority and Great Yarmouth Port Authority and navigation users to improve navigations generally as valuable environmental, recreational, commercial and heritage resources. |

## Further Information

Further information on the work of the Agency can be found in a series of Agency strategy documents covering water quality, water resources, flood defence, fisheries, conservation, navigation, recreation, and research and development. These documents are available from the Corporate Planning Section at the Agency's head office in Bristol.

We maintain several public registers which can be inspected at most Regional Environment Agency Offices. Information is usually provided free of charge, but for large and complex requests we may charge for staff time and materials. There are also standard charges for some specific searches. Further details about our public registers and the types of information we hold are available in our leaflet 'A Guide to Information Available to

the Public'. Copies are available from the Public Relations Department at our Peterborough office and Area Customer Services.

At present, offices may have information relevant only to their local area; please telephone before visiting to ensure that the information required is available at your local office.

Some environmental details and information about our public registers are available on the internet on **http://www.environment-agency.gov.uk**.

## Appendix B: Glossary

| | |
|---|---|
| **Above ordnance datum (AOD)** | land levels are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as 'Ordnance Datum'. Contours on Ordnance Survey maps of the UK show heights in metres above Ordnance Datum. |
| **abstraction** | removal of water from surface or groundwater, either permanently or temporarily, usually by pumping. |
| **abstraction licence** | licence issued by the Environment Agency under s.38 of the Water Resources Act 1991 to permit removal of water from a source of supply. It can limit the quantity of water taken daily etc. |
| **algae** | a diverse group of simple aquatic plants, some microscopic, which can grow in rivers and the sea in great profusion (blooms). |
| **algal blooms** | Rapid growth of phyto-plankton in marine or freshwaters which may colour the water and may accumulate on the surface as a scum. |
| **alluvial** | referring to materials eroded, transported and deposited by the action of river flow. |
| **ammonia** | a chemical found in water often as the result of discharge of sewage effluents. High levels of ammonia affect fisheries and abstractions for potable water supply. |
| **aquatic plants** | a term given to plants that grow entirely covered by water, like water-milfoil, or at the surface, such as yellow water-lily. Some plants have both aquatic and emergent forms. |
| **aquifer** | a permeable geological stratum or formation that is capable of both storing and transmitting water in significant amounts. |
| **Asset Management Plan (AMP)** | means by which the water undertakers plan the work required and Asset Management capital expenditure necessary for improvements and maintenance of Plan. These are drawn up through consultation with the Environment Agency and other bodies to cover a five year period. AMPs have to be agreed by DETR and Ofwat. |
| **augmentation** | the addition of water by artificial input. Usually to 'top up' low flows in the summer by either groundwater pumping or via reservoir release. |
| **baseflow** | the flow in a river derived from groundwater sources. |
| **Biochemical Oxygen Demand (BOD)** | a standard test which measures over 5 days the amount of oxygen taken up by aerobic bacterial to oxidise organic (and some inorganic) matter. |
| **biodiversity** | diversity of biological life, the number of species present. |
| **biomanipulation** | Technique developed and refined by the Broads Authority and the Environment Agency, formerly the National Rivers Authority to fully restore lakes and broads in a short space of time. |
| **biomass** | a quantitative estimate of animal and/or plant matter. |
| **blue-green algae** | ubiquitous, usually microscopic plankton with properties characteristic of both bacteria and algae. In still, calm conditions they can grow to excess to form dense blooms and scum, and are known to produce chemicals toxic to mammals. |

| | |
|---|---|
| **buffer zone** | strip of land, 10-100 m wide, alongside rivers which is removed from intensive agricultural use. |
| **catchment** | the total area from which a single river collects surface runoff. |
| **CEFAS** | Centre for Environment, Fisheries and Aquaculture Science. |
| **coarse fish** | this is a lay-man's term for cyprinid fish and other commonly associated species such as pike, perch and eels of angling significance. The term does not normally refer to minor species such as bullhead, stone loach, minnow and stickleback. |
| **Coastal and Estuarine Working Party (CEWP)** | classification system; under the CEWP scheme stretches of estuaries are allocated points depending on their biological, aesthetic and chemical quality. There are four classes ranging from A to D which classify each stretch of the estuary as good, fair, poor and bad respectively. |
| **consent (discharge)** | a statutory document issued by the Environment Agency under Schedule 10 of the Water Resources Act 1991 as amended by the Environment Act 1995 to indicate any limits and conditions on the discharge of an effluent to a controlled water. |
| **consent (land drainage)** | an approval for specified structural works in areas under Environment Agency control. |
| **County Wildlife Sites** | sites which are of county significance for wildlife. |
| **Countryside Stewardship Scheme** | an initiative run by MAFF to enhance and conserve farming landscapes, wildlife habitats and cultural heritage. |
| **diffuse pollution** | pollution without a single point source e.g. acid rain, pesticides, urban runoff etc. |
| **dissolved oxygen (DO)** | the amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is an important, but highly variable, indicator of 'health' of a water. It is used to classify waters. |
| **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. |
| **ecosystem** | system involving the interactions between a community and its non-living environment. |
| **environmental impact assessment** | a process for predicting the impact of development on the environment. |
| **Environmentally Sensitive Area (ESA)** | an area designated by MAFF where grant aid is available to support traditional farming methods. |
| **eutrophication** | the enrichment of water by nutrients, such as compounds of nitrogen or phosphorus. It causes an accelerated growth of algae and higher forms of plant life, changes in the ecological balance and deterioration in water quality. |
| **floodplain** | parts of river valleys or coastal plains which are inundated during floods. It includes areas protected by flood defences. |
| **fluvial** | pertaining to, or found in freshwater rivers. |
| **General Quality Assessment (GQA)** | a scheme used to make regular assessments of the quality of rivers to monitor trends over time and to compare rivers in different areas. Four components are being developed for the GQA assessment; general chemistry, nutrients, |

| | |
|---|---|
| | aesthetics and biology, each providing a discrete 'window' on the quality of the river stretches. |
| **groundwater** | water contained in the void spaces in pervious rocks and within the soil. |
| **habitat** | customary and characteristic home of a species or community. |
| **hydrology** | the study of water, above, on and below the earth's surface, and its dynamics. |
| **Integrated Pollution Control (IPC)** | an approach to pollution control in the UK which takes account of potential effects upon all environmental media. Applies to prescribed processes and uses the principles of BATNEEC and BPEO. |
| **Internal Drainage Board (IDB)** | authorities responsible for dealing with land drainage within a district, independent of the Environment Agency. They are primarily concerned with agricultural land drainage but also may be involved with water supply to their district for agricultural purposes. Drainage Boards also have environmental and recreational duties. |
| **landfill site** | the engineered deposit of waste into or onto land so that pollution or harm to the environment is minimised or prevented and, through restoration, to provide land which may be used for another purpose. |
| **leachate** | solution formed when water percolates through a permeable medium. Can be mineral-rich, toxic or carry bacteria. |
| **Local Agenda 21** | A comprehensive programme of world-wide action to achieve a more sustainable pattern of development for the next century. UK Government adopted the declaration at the UN Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992. |
| **macrophyte** | plants clearly visible without the aid of a microscope but excluding lichens, fungi, mosses and algae. |
| **Main River** | the watercourse shown on the statutory 'Main River maps' held by Environment Agency and MAFF, designated under the Water Resources Act 1991. The Environment Agency has permissive powers to carry out works of maintenance and improvement on these rivers. Formal consent is required for all activities that interfere with the bed or banks of the river or obstruct the flow. |
| **maintenance works** | regular river maintenance such as desilting or weed control. |
| **managed retreat** | The deliberate abandoning of an existing tidal defence in order to obtain economic and ecological advantage. A new defence may be constructed landward of the old line. |
| **margin** | a term used to describe the junction of the water and the bank. |
| **minimum residual flow** | target flow set locally and not legally defined. |
| **National Nature Reserve (NNR)** | sites owned or leased and managed by English Nature and established as reserves under the National Parks and Access to the Countryside Act 1949. |
| **Nitrate Vulnerable Zone** | an area where nitrate concentrations in sources of public drinking water exceed, or are at risk of exceeding the limit of 50 mg/l laid down in the 1991 EC Nitrate Directive, and where compulsory, un-compensated agricultural measures will be introduced from 1996 as a means of reducing those levels. |
| **percentile** | one of 99 values of a variable dividing its distribution into 100 groups with equal frequencies. |

| | |
|---|---|
| **phyto-plankton** | microscopic photosynthetic organisms adapted to live suspended in water (e.g. algae). |
| **Plan area** | referring to the South Essex Local Environment Agency Plan (LEAP) area |
| **Ramsar** | Ramsar* sites are wetlands of international importance. They are statutory areas designated for their waterfowl populations or important plant and animal communities. (* a town in Iran where the international convention originally agreed in 1975 to stem the progressive encroachment on, and loss of, wetland). |
| **reach** | a length of channel. |
| **rehabilitation** | the partial return to a pristine state. |
| **residual flow** | the flow remaining in the watercourse after abstractions have taken place. |
| **restoration** | the return to a pristine state. |
| **riffle** | shallow, stony or gravely part of river bed where the water surface is broken in low flows. |
| **riparian** | relating to or situated on the bank of a river or stream. |
| **riparian owner** | owner of land next to river; normally owns river bed and rights to mid-line of channel. |
| **river corridor** | land which has visual, physical or ecological links to a watercourse and is dependent on the quality or level of the water within the channel. |
| **runoff** | water moving over a catchment surface. Normally regarded as rainfall minus evapotranspiration (evaporation and loss of water by plants) but commonly used to mean rainwater flowing across the land (also known as overland flow). |
| **salmonid fish** | game fish, e.g. trout and salmon. |
| **S105 surveys** | section 105 of the Water Resources Act 1991 allows for Standards of Service, Assets and Flood Risk Surveys. |
| **sewage** | liquid waste from cities, towns and villages which is normally collected and conveyed in sewers for treatment and/or discharge to the environment. |
| **sewerage** | a system of underground pipes designed to carry sewage to Sewage Treatment Works. |
| **Shoreline Management Plan (SMP)** | a document which sets out the coastal defence strategy for a specified tidal frontage taking account of natural coastal processes and human (and other) environmental influences and needs (also see Section 2.15). |
| **siltation** | the deposit of material carried in suspension. |
| **Site of Special Scientific Interest** | sites of national importance designated under the Wildlife and Countryside Act 1981 by English Nature in England. Sites may be designated to protect wildlife, geology or land forms. |
| **sludge** | the accumulation of solids from treatment processes. |
| **Special Protection Areas (SPAs)** | statutory protected habitats for wild birds under EC Birds Directive 79/409/EEC. |
| **Special Area of Conservation (SAC)** | areas designated under the EC Habitats Directive. Sites that are considered to be of international importance for key habitats and species. |
| **spray irrigation** | the watering of crops by spraying. |

| | |
|---|---|
| **Structure Plans** | statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale. |
| **surface water** | general term used to describe all the water features such as rivers, streams, springs, ponds and lakes. |
| **sustainable development** | development that meets the needs of the present without compromising the ability of future generations to meet their own needs. |
| **wetlands** | areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt. |
| **zooplankton** | animal organisms consisting mainly of small crustaceans and fish larvae; the animal constituent of plankton. |

## Appendix C: Abbreviations

| | |
|---|---|
| AEG | Area Environment Group |
| Agency | Environment Agency |
| AWS | Anglian Water Services |
| BAP | Biodiversity Action Plan |
| BC | Borough Council |
| BOD | Biochemical Oxygen Demand |
| CEFAS | Centre for Environment, Fisheries and Aquaculture Science |
| CHaMP | Coastal Habitat Management Plans |
| DETR | Department of the Environment, Transport and the Regions |
| DO | Dissolved Oxygen |
| EC | European Commission/Community/Union |
| ESA | Environmentally Sensitive Areas |
| EU LIFE | European Union Life Fund |
| FRCA | Farming & Rural Conservation Agency |
| GQA | General Quality Assessment |
| IPC | Integrated Pollution Control |
| LEAP | Local Environment Agency Plan |
| MAFF | Ministry of Agriculture, Fisheries and Food |
| NGO | Non-Governmental Organisation |
| pe | population equivalent |
| RE | River Ecosystem |
| RFO | River Flow Objectives |
| RSPB | Royal Society for the Protection of Birds |
| cSAC | candidate Special Area of Conservation |
| SCEALA | Standing Conference of East Anglian Local Authorities |
| SMP | Shoreline Management Plan |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| STW | Sewage Treatment Works |
| UK | United Kingdom |
| WLMP | Water Level Management Plan |

## MANAGEMENT AND CONTACTS:

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

Head Office is responsible for overall policy and relationships with national bodies including Government.

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS32 4UD
Tel: 01454 624 400 Fax: 01454 624 409

Internet World Wide Web www.environment-agency.gov.uk
www.environment-agency.wales.gov.uk

### ENVIRONMENT AGENCY REGIONAL OFFICES

**ANGLIAN**
Kingfisher House
Goldhay Way
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371 811
Fax: 01733 231 840

**MIDLANDS**
Sapphire East
550 Streetsbrook Road
Solihull B91 1QT
Tel: 0121 711 2324
Fax: 0121 711 5824

**NORTH EAST**
Rivers House
21 Park Square South
Leeds LS1 2QG
Tel: 0113 244 0191
Fax: 0113 246 1889

**NORTH WEST**
Richard Fairclough House
Knutsford Road
Warrington WA4 1HG
Tel: 01925 653 999
Fax: 01925 415 961

**SOUTHERN**
Guildbourne House
Chatsworth Road
Worthing
West Sussex BN11 1LD
Tel: 01903 832 000
Fax: 01903 821 832

**SOUTH WEST**
Manley House
Kestrel Way
Exeter EX2 7LQ
Tel: 01392 444 000
Fax: 01392 444 238

**THAMES**
Kings Meadow House
Kings Meadow Road
Reading RG1 8DQ
Tel: 0118 953 5000
Fax: 0118 950 0388

**WALES**
Rivers House/Plas-yr-Afon
St Mellons Business Park
St Mellons
Cardiff CF3 0LT
Tel: 01222 770 088
Fax: 01222 798 555


For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

ENVIRONMENT AGENCY
GENERAL ENQUIRY LINE
**0645 333 111**

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

ENVIRONMENT AGENCY
EMERGENCY HOTLINE
**0800 80 70 60**

ENVIRONMENT AGENCY

**Regional Headquarters:**
Environment Agency
Kingfisher House
Orton Goldhay
Peterborough PE2 5ZR
Tel: 01733 371811
Fax: 01733 231840

Vicky Eade
LEAP Officer
Customer Services
Environment Agency
Eastern Area - Anglian Region
Cobham Road
Ipswich
Suffolk IP3 9JE

Printed on Cyclus - a 100% recycled TCF paper
P231
AN-11/99-750-D-BEXM