local environment agency plan

NORTH WEST NORFOLK

DRAFT LEAP

DECEMBER 1999

ENVIRONMENT AGENCY

key details

Administration Details:
County Councils: Norfolk; Cambridgeshire
District Councils and Borough Councils: King's Lynn & West Norfolk; Breckland; Fenland

Main Towns: King's Lynn; Hunstanton; Downham Market

Total Area: 1,007 km^2

Topography and Landscape: **Ground Levels:** Min. Level: -2 m AOD Max. Level: 98 m AOD

Water Utilities Company: Anglian Water Services Ltd (In addition, there are a number of properties that receive no mains supply and rely on private supply boreholes)

Internal Drainage Boards: West of Ouse; Gaywood; Hilgay Great West Fen; Northwold; Southery & District; Stoke Ferry; Stringside; Marshland Smeeth & Fen; Magdalen; Downham & Stow Bardolph; Middle Level Commissioners; East of the Ouse; Polver and Nar

Water Quality:

Biological Quality Grades 1997*	Grade	Length of River (km)	Chemical Water Quality 1998	Grade	Length of River (km)
	a 'Very Good'	53.3		A 'Very Good'	0
	b 'Good'	55.3		B 'Good'	49.1
	c 'Fairly Good'	32.1		C 'Fairly Good'	49.0
	d 'Fair'	8.5		D 'Fair'	32.6
	e 'Poor'	11.5		E 'Poor'	38.9
	f 'Bad'	8.9		F 'Bad'	0

*1998 biology data was not available at the time of going to press

Pollution Incidents in the LEAP Area (1998):

Pollution Type	1	2	3	4
Oils	0	2	10	0
Sewage	0	3	9	0
Chemicals	0	1	5	0
Organics	0	2	3	0
Others	1	1	4	32
Total	**1**	**9**	**31**	**32**

Category:
1 Major Incident
2 Significant Incident
3 Minor Incident
4 Unsubstantiated Incident

Length of statutory main rivers:	138.45 km
Embanked main rivers:	56.65 km
Area protected by embanked channel:	300 km^2
Area of natural fluvial floodplain:	none
Sites of Special Scientific Interest (SSSIs):	17
Water dependent SSSIs:	8
Candidate Special Areas of Conservation (cSACs):	4
Special Protection Areas (SPAs):	1
County Wildlife Sites:	256
Scheduled Monuments (SMs):	71
Game (trout) fishery:	29 km
Cyprinid (coarse) fishery:	74 km
Length of navigable rivers:	25.79 km
Number of surface water abstraction licences:	98
Number of groundwater abstraction licences:	151
Number of private consented discharges:	26
Number of major consented Crown discharges:	2
Number of major consented trade discharges:	6
Water treatment works discharges:	4
Total number of IPC authorisations:	12
Number of RAS authorisations:	1
Number of RAS registrations:	20
Determined land drainage consents:	41
No. of current waste management licences:	22 (10 of which are closed)
Number of former landfill sites:	7
Number of working landfill sites:	9

your views

Publishing the Draft Local Environment Agency Plan (LEAP) marks the beginning of the Consultation Period for the North West Norfolk area. This document highlights the issues we believe need to be addressed in this area.

We hope that this report will be read by anyone who has an interest in the environment in this locality. Your views will help us finalise the LEAP, due in September 2000.

In particular, we want to hear your views on the following:

- **Have we identified the major issues?**
- **Have we identified all the potential options for action to resolve these?**
- **Do you agree with the order of priority given to the issues?**
- **Do you agree with our Vision for the plan area?**
- **Have you any comments on the appearance and contents of the report?**

Please comment in writing to:

Team Leader (LEAPs)
The North West Norfolk Draft LEAP
Environment Agency
Bromholme Lane
Brampton
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Cambs PE18 8NE

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Telephone enquiries: (01480) 414581
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All comments should reach us by 4th April 2000.

Further copies or more information on this Draft LEAP are also available from the above address.

ENVIRONMENT AGENCY

ENVIRONMENT AGENCY

ANGLIAN REGION
(CENTRAL AREA)

THE NORTH WEST NORFOLK LOCAL ENVIRONMENT AGENCY PLAN

D R A F T L E A P

December 1999

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FOREWORD

The Environment Agency is one of the most powerful environmental regulators in the world. By combining the regulation of air, land and water we have a unique opportunity to look at the environment in an integrated way.

The North West Norfolk Draft Local Environment Agency Plan (LEAP) aims to promote integrated environmental management. This Plan has been drawn up for consultation and seeks to develop partnerships with a wide range of organisations and individuals that have a stake in the future of the local environment. We will use the LEAP process to ensure that improvements in the local environment are achieved and we will report annually on our progress.

This is the sixth and final Draft LEAP in this present series produced by Central Area and with its publication, Central Area has full LEAP coverage. To improve our consultation with a wider group of key stakeholders early in the LEAP process, we formed the North West Norfolk Stakeholder Group. The Group has produced the prioritised list of issues for the LEAP area and I believe that this is a significant step forward in our partnership with key organisations.

This and subsequent plans will represent a shared vision for the future and play a vital role in the protection of our environment, whilst recognising the ever-growing pressures put upon it and the need to balance costs and benefits.

We hope that you will find this document useful and informative and look forward to receiving your comments. Your responses are extremely important; only by hearing your opinions and views can we hope to provide a final LEAP in which the local community, industries, local authorities and other interested organisations will feel they have a sense of shared ownership with the Agency.

Keith Stonell
Area Manager (Central)

EXECUTIVE SUMMARY

The North West Norfolk Draft Local Environment Agency Plan (LEAP) is the last of this series to be produced by Central Area of the Environment Agency's Anglian Region. With the publication of this document, Central Area has met the nationally set target to produce consultation documents for its entire area by the end of 1999.

The area covered by the LEAP comprises the lower reaches of the River Great Ouse along with its tributaries, including the rivers Heacham, Ingol, Babingley, Gaywood and Nar. It also includes the Relief Channel, part of the Cut Off Channel and the Middle Level Main Drain. The towns of King's Lynn, Downham Market, Hunstanton and part of Wisbech are all within this area.

The LEAP area is almost entirely rural with arable farming being the dominant land use. In the east, the land is gently undulating with several large estates, including Royal Sandringham. The western part of the area is flat fenland, much of which is below high tide level and vulnerable to flooding. Agricultural land quality here is particularly high.

ISSUES FACING THE AREA

The following are some examples of what are believed to be the problems and challenges facing the North West Norfolk area. These were developed in conjunction with the Area Environment Group, and the North West Norfolk Stakeholder Group:

Managing Our Water Resources

In some places, the summer demand for water exceeds the resources available and this must be balanced against the ecological requirements to maintain river flows and support wetland habitats. The need for a clear statement on the allocation of water resources and the licensing policy is highlighted.

Enhancing Biodiversity

We need to enhance and manage river and floodplain habitats to benefit both fish stocks and associated wildlife. The possibilities for increasing the sea trout populations in the rivers Nar and Babingley are also considered, as is the need to assess the ecological status of headwaters.

Enjoyment of the Waterways

Facilities for access and recreational activities need to be improved, particularly on the Relief and Cut Off Channels.

Managing Waste

There is some concern over the environmental impacts of the waste management facilities at Blackborough End. The need for greater liaison with site operators and the local community is identified.

Risks to Water Quality

River water quality in this area is generally good. Most problems are associated with low river flows and high levels of nutrients (nitrates and phosphates) leading to eutrophication. The vulnerability of much of the groundwater to pollution is highlighted, as is the failure of beaches at Hunstanton and Heacham to meet guideline quality standards.

Needs for Monitoring and Further Investigation

The residents of North Lynn have raised concerns over the emissions from local industries and the effect these are having on the health of the community. The need for further monitoring of the situation is highlighted.

Improving Flood Defences

A number of issues relating to coastal flooding are raised, including the need to improve the coastal defences between Hunstanton and Snettisham. The impact of siltation of the Tidal River on flood defences and navigation is discussed, as is flooding and flood defences on the lower River Nar. The potential use of managed realignment ('managed retreat') at some locations in the LEAP area is investigated.

DRAFT VISION

Most societies want to achieve economic development to secure a better quality of life, now and in the future, while still protecting the environment. The concept of sustainable development tries to reconcile these two objectives - meeting the needs of the present without compromising the ability of future generations to meet their own needs. We are working towards making this concept a reality.

We will undertake our activities with others to achieve protection and enhancement of the environment as a whole. Where possible we will take into account the effects of activities on water, air and land.

In general and in the long-term the Vision encompasses:

- Developing partnerships with, for example, industry, Local Authorities, environmental groups and educational establishments;
- Setting and enforcing consistent standards for waste management practice to regulate the movement, treatment, storage and disposal of controlled wastes to protect and enhance the environment;
- Effectively managing the water resources of the LEAP area in a sustainable manner, to achieve secure water supplies for abstractors and a better water environment for future generations;
- Realising opportunities to improve the biodiversity/conservation value of the plan area with particular respect to river corridors and floodplains;
- Maintaining the high quality of the local rivers by monitoring to ensure continued compliance with river quality targets;
- Maintaining and where necessary improving flood protection along all Main Rivers; and
- Protecting, improving and promoting recreation on or near water, as assets of environmental, economic and social value.

More specifically and in the short-term it encompasses:

- Achieving an improvement in water quality, particularly where targets are not presently being met;
- Managing water resources by improving our understanding of the local hydrology and reviewing abstractors' demands for water and the needs of the water environment;
- Reviewing the existing standard of flood protection and investigate schemes and maintenance to alleviate flooding;
- Encouraging sustainable solutions that particularly improve waste management sites;
- Achieving improved fish stocks through better management, eg, the investigation of fish mortalities and failure to meet fish biomass targets; and
- Working with Local Authorities to implement the UK Air Quality Strategy.

The successful future management of the Plan area requires the Agency to effectively respond to ever-increasing pressures exerted on the environment of the Bedford Ouse and to target resources where they are most needed.

Through our consultation exercise, we believe that the local community can share this Vision. It is through establishing strong links with Local Authorities and communities, working together with industry and agriculture and an increasing public awareness of the need to protect our environment that this Vision will become a reality.

CONTENTS

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CHAPTER ONE - INTRODUCTION

This section sets out the role of the Environment Agency and Local Environment Agency Plans along with the timescale for the production of the North West Norfolk LEAP.

1.0 The Environment Agency

'Guardians of the Environment'

The Environment Agency (the Agency) came into being on 1 April 1996 to protect, monitor and improve the environment in its broadest sense – ultimately contributing to the worldwide goal of sustainable development. We have become one of the most powerful environmental regulators in the world. By exerting our influence on the regulation of air, land and water, we have a unique opportunity to look at our environment in an integrated and holistic manner.

Our Vision is:

'A better environment in England and Wales for present and future generations'

Our Aims 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 minimise, re-use and recycle their waste;
- To improve standards of waste disposal;
- To manage water resources to achieve a proper balance between the needs of humans and the needs of the environment;
- To work with other organisations to reclaim contaminated land;
- To develop and improve salmon and freshwater fisheries;
- To conserve and improve river navigation;
- To tell people about environmental issues by educating and informing them; and
- To set priorities and identify 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 business like in all we do.

1.1 The Role of the Environment Agency

The 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 Table 1.1 and 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 in which we live. Indeed, the creation of the Agency was, in part, 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.

In taking a long-term perspective, we have to anticipate risks and encourage precautions, 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.

One of the key outcomes of the United Nations 'Earth Summit' held in Rio de Janeiro in 1992 was agreement by government that, in order to solve global environmental problems, local action is crucial: we must all therefore think globally but act locally.

1.2 Routine Work of the Agency

As '*Guardians of the Environment*', our principal aim is to protect and enhance the environment, thus contributing to the Government's overall commitment to sustainable development. We will do this by integrating environmental protection for land, air and water using pollution prevention and control, education and where necessary, enforcement. We have related responsibilities for the management of water, fish and wildlife and for protecting people and property from flooding.

Most of our work operates at a local level and there is a strong commitment to an integrated approach to managing the environment. Local Environment Agency Plans (LEAPs) are one way of achieving this integrated approach, although they do not cover routine work carried out to meet statutory requirements or national Agency policy. This work is described in our Corporate Plan (published annually in September) and the Environmental Strategy - *An Environmental Strategy for the Millennium and Beyond* (September 1997). A summary of our routine work is in Appendix B.

1.3 Local Environment Agency Plans

We are committed to delivering environmental improvement at the local level and one of the ways to do this will be through Local Environment Agency Plans (LEAPs). These plans will reflect our close contact with industry, the public and local government and will contribute towards achieving sustainable development.

The process of drawing up these plans will involve close consultation with all interested parties. It will promote the effective, accountable and integrated delivery of environmental improvement at a local level. The plans will translate policy and strategy into delivery on the ground and will result in actions, either for us to fulfil, or for others to undertake through influence and partnership. We believe that the process will benefit local communities by influencing and advising external decision-makers and public opinion. It will build trust by being open and frank when dealing with all issues.

The Agency has eight Regions, which are shown on the back cover of this document. The Anglian Region comprises three Areas and the North West Norfolk LEAP is within Central Area (refer to Map 1.1). The LEAP area is bounded to the east by the North Norfolk and the Broadland Rivers LEAP areas (to obtain copies of these documents, call 01473 727712). To the south is the Ely Ouse LEAP area, which borders the North West Norfolk area at Denver. The Old Bedford

North West Norfolk
Local Environment Agency Plan
Map 1.1

ENVIRONMENT AGENCY

North West Norfolk Area Location

KEY

- Built up area
- North West Norfolk Plan Area
- Regional Boundary
- LEAP boundary

LEAP area is to the south-west and the Nene LEAP area to the west (to obtain a copy of the Nene LEAP, call 01522 513100). The surface water links between the Old Bedford and the North West Norfolk LEAP areas are the Old and New Bedford Rivers.

We aim to produce 132 LEAPs throughout England and Wales. They will be published in draft form by the end of 1999, with completion of consultation, where necessary, taking place during the year 2000.

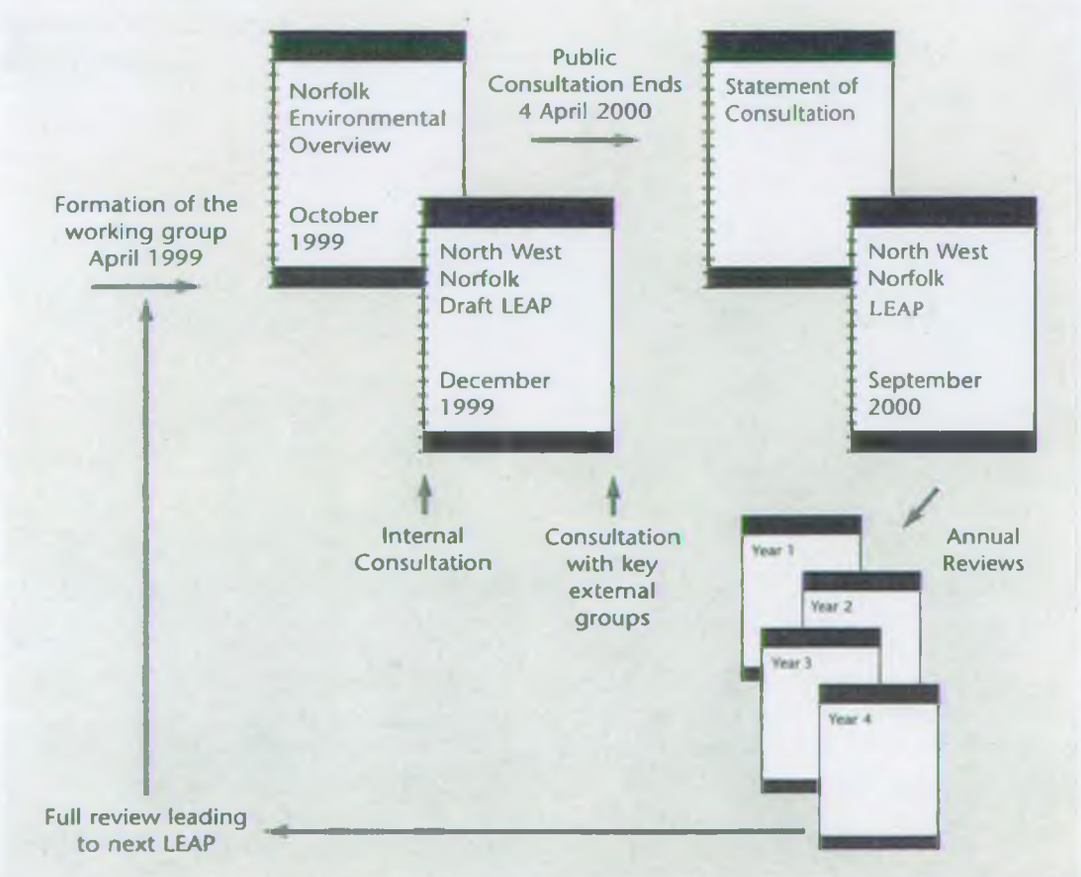
1.4 The LEAP Process

We are committed to a programme of LEAPs in order to produce a local agenda of integrated action for environmental improvement. These will allow us to deploy resources to best effect and optimise benefits for the local environment.

LEAPs help to identify, assess, prioritise and resolve local environmental issues related to our functions, taking account the views of our local customers. The outcome of the process is a local programme detailing integrated actions for environmental improvement that will benefit the local environment.

The LEAP process involves several stages that are illustrated by the following diagram:

Figure 1.1: The LEAP process



1.5 Environmental Education Strategy

Education has to be a priority if sustainable environmental improvements are to be achieved. With this in mind we published our education strategy, *Green Shoots*, in January 1997. In the long-term, education on environmental issues could ease the regulatory burden and associated costs.

Our education programmes are to be aimed at those working in education, industry and the community at large. The strategy acknowledges that environmental improvement and sustainable development can only be achieved with the involvement of society as a whole. It also recognises the need to share expertise and resources with other organisations in collaborative ventures in order to develop a more responsible and environmentally aware society. It contains six objectives, which are to:

- Build positive partnerships;
- Help to educate young people;
- Improve the understanding of environmental issues through such schemes as work placements;
- Work with industry to promote the prevention of pollution;
- Foster public awareness of environmental issues; and
- Build on current, and develop new, international relationships to further sustainable development.

This Plan concentrates on more innovative and empowering activities such as:

- The CREST Award Scheme – Environment Research Challenge (project-based research on real issues for the 11-18+ group);
- Schools conferences to elicit potential solutions for the future based on current environmental issues; and
- 'Hands-on' projects to restore and maintain environmentally damaged areas (with youth clubs).

The programme for future years will build upon these initiatives to help deliver the other objectives, but the focus will change year-on-year.

This will not be an easy task, nor one achieved by us alone. We do, however, have various opportunities to exploit, particularly where LEAPs provide local focus. The concept of learning by empowering people to make choices is both valuable and under-used. Our plans, Local Agenda 21 and other such avenues will be fully exploited in the future.

All our actions must take into account a number of umbrella duties which include: furthering conservation; environmental impact assessments for our engineering works; the requirement to assess costs and benefits of our actions; the contribution to sustainable development; and the impact on rural communities.

1.6 Environmental Services Provided By Others

Our tasks are laid down in Acts of Parliament and do not cover all aspects of environmental service to the general public. Table 1.1 below summarises common environmental concerns and who has responsibility for them:

Table 1.1: Environmental concerns: who is responsible?

Environmental concern	Responsible party
Low flows in main rivers	Environment Agency
Flooding of property from main rivers	Environment Agency
Flooding of property from non-main rivers (ordinary watercourses)	Local Authority/Internal Drainage Board/Riparian Owners
Water quality in main and non-main rivers and groundwater	Environment Agency
Flooding of property from foul sewer	Water Company
Burst water mains	Water Company
Problem with mains water supply	Water Company
Strange taste, smell or colour of mains tap water	Water Company
Sewage treatment	Water Company (although the Environment Agency regulates the discharges from sewers and sewage treatment works)
Navigation on some rivers	Environment Agency
Pollution incidents/fish mortalities	Environment Agency
Air pollution from large industry (Part A processes)	Environment Agency
Air pollution from small industry (Part B processes) and small businesses	Local Authority
Air pollution from traffic	Local Authority/Police
Smoke from domestic chimneys	Local Authority
Smoke from bonfires	Local Authority
Environmental Health (e.g. vermin, food hygiene)	Local Authority
Contaminated land	Land Owner/Environment Agency/Local Authority
Noise	Local Authority (except if it is to do with Environment Agency works, in which case Environment Agency)
Litter	Local Authority (except if it is restricting the flow of a river, in which case Environment Agency or IDB)
Fly-tipping	Local Authority/Environment Agency
Waste management	Environment Agency
Waste planning	Environment Agency/County Council
Regulation of waste disposal facilities	Environment Agency/Local Authority
Waste minimisation/recycling	Environment Agency/Local Authority
Local planning issues	Local Authority
Granting of planning permission	Local Authority
Use and disposal of radioactive materials	Environment Agency
Damage to SSSIs	English Nature

CHAPTER TWO – THE NORTH WEST NORFOLK AREA

This section provides a brief overview of the LEAP area and a summary of the Environment Overview.

2.0 The North West Norfolk Area

The North West Norfolk LEAP area covers 1007 km^2 and is almost entirely within Norfolk. It has a population of approximately 109,000 (1996) which is predicted to increase to approximately 127,000 by the year 2006. 40% of the population is located in the three main towns of King's Lynn (35,000), Downham Market (6,000) and Hunstanton (2,500). King's Lynn is the major urban centre and is the nodal point for the trunk and primary road network in the area, which provides links with Swaffham, Downham Market and Hunstanton. There is also a main railway line from King's Lynn to London. Map 2.1 shows the infrastructure of the area and map 2.2 shows the Local Authorities.

The historic town of King's Lynn dates back to the 12th century and has many merchants' houses, medieval riverside storerooms and boasts England's only surviving Hanseatic warehouse. The town was the birthplace of Captain George Vancouver, who voyaged famously to Canada. Admiral Lord Nelson was born in Burnham Thorpe, north of King's Lynn. The area is also known for its classic stately homes, with Holkham Hall boasting 3,000 acres of coastal Deer Park and the 15th century Oxburgh Hall, which featured in television's *Love on a Branchline.* The most famous stately home in the area is Sandringham, which was bought in 1862 by Queen Victoria for the future King Edward VII. Still the Norfolk home of the Royal Family, its house, gardens, museum and parks are open to the public when members of the Royal Family are not in residence.

2.1 Environmental Resources

2.1.1 Geology and Water Resources

Rainfall in the LEAP area varies from 580 mm – 730 mm, compared to the long-term UK average of 1082 mm. As with other areas in the Anglian Region, evaporation exceeds rainfall during most summers when demand for water resources is at its highest.

The River Great Ouse north of Denver is also known as the Tidal River, and receives a number of freshwater inputs. To the west, water is discharged from Well Creek and the Old Bedford River, and water from the Middle Level is discharged via St Germans Pumping Station. To the east, the Rivers Nar, Gaywood and Babingley flow into the Tidal River while the Rivers Ingol and Heacham flow directly into the Wash. Most of the westerly flowing rivers originate from springs in the eastern chalk areas, and flow in embanked courses across the low-lying Internal Drainage Board (IDB) areas. Water from other IDB areas also discharges into the Tidal River at various points.

The local geology consists of rock strata that dip gently to the east. Over much of the area superficial deposits cover these strata. Kimmeridge and Ampthill clays overlain by alluvial and estuarine deposits dominate the western part of the area. The central section is dominated by the Norfolk Greensand which is overlain by fen and river deposits. The east of the area consists of Chalk overlain in areas by glacial boulder clay.

This varying geology has resulted in the catchment consisting of two distinctly different areas. The west area is low-lying, the lowest point being 2 m below Ordnance Datum (OD). The eastern part is a highland area of chalk outcrop, with a maximum elevation of 93 m above OD at Brink Hill near Gayton.

The main aquifers (layers of rock able to yield significant quantities of water to wells and springs) used for groundwater abstraction are the Chalk and the Norfolk Greensand. Water from these aquifers is used principally for public water supply and spray irrigation. Sand and gravel


North West Norfolk
Local Environment Agency Plan
Map 2.1
Environment Agency
50
60
70
80
90
40
30
20
10
TF
00
TL
The Wash
(at high tide)
Hunstanton
River Hunstanton
River Ingol
A149
Babingley River
A148
Great Ouse/Tidal River
King's Lynn
A17
A47
A47
River Nar
A1065
Wisbech
Great Ouse/Tidal River
Relief Channel
A1101
A10
A1122
A1122
A1122
Swaffham
Downham
Market
Cut Off Channel
Infrastructure
KEY
LEAP boundary
Main river
Built up areas
A road
Railway
N
0
10km
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North West Norfolk
Local Environment Agency Plan
Map 2.2
Environment Agency
50
60
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40
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20
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TF
00
TL
Hunstanton
River Hunstanton
The Wash
(at high tide)
River Ingol
Babingley River
Great Ouse Tidal River
Gaywood River
King's Lynn
Middleton Stop Drain
NORFOLK
River Nar
Wisbech
Middle Level Drain
Great Ouse Tidal River
Relief Channel
Swaffham
CAMBS.
Downham
Market
Cut Off Channel
Plan Area Overview -
Local Authorities
KEY
LEAP boundary
Main river
Non-main river
Built up areas
King's Lynn and
West Norfolk
Breckland
Fenland
N
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deposits, found within river valleys such as the Nar, can be locally important water resources for some farm irrigation requirements.

The amount of water available to abstract from these aquifers is calculated by considering factors such as rainfall, evaporation, the nature of the rock strata, and the requirement for water for the environment. These calculations (called the groundwater balance) were originally calculated in 1994, and are being revised during 1999 and 2000. At present, the water resources of most parts of the chalk aquifer are considered to be fully committed to existing abstractors and the water environment. This means that no additional water would be licensed from these areas. The current groundwater balance demonstrates that there is some water available from the Norfolk Greensand, so new abstraction requests from this unit can be considered, but are subject to the usual technical assessment of the impacts.

Springflow and seepage from the aquifers are important for the following wetland sites;

- Roydon Common Site of Special Scientific Interest (SSSI);
- Dersingham Bog SSSI (which form the Roydon Common & Dersingham Bog candidate Special Area of Conservation (cSAC); and
- East Walton and Adcocks Common SSSI (that forms part of the Norfolk Valley Fen cSAC).

2.1.2 Natural Habitats

This area is particularly rich in valuable wildlife sites; it contains 17 SSSIs, eight of which are water-dependent. The River Nar is one of these SSSIs as it is an outstanding river of its type, combining the characteristics of a southern Chalk stream with that of an East Anglian fen river. Roydon Common is designated as a Ramsar site. In addition to the Roydon Common & Dersingham Bog cSAC the Wash and Norfolk Valley Fen are two cSACs designated under the Habitats Directive.

The Wash, into which the Tidal River flows, is one of Britain's most important wildlife areas. It has been designated as a SSSI, a Ramsar site, a Special Protection Area (SPA), a marine cSAC and forms part of the North Norfolk Coast and Wash cSAC. It is also a National Nature Reserve (NNR). It is the most important area in Britain for wintering waterfowl; it supports internationally important numbers of waterfowl for most of the year except June and it is nationally important for 15 species, 13 of which are also internationally important. The Wash also forms an important part of a network of estuaries used by waterfowl around Britain and Europe, in winter and during the migration seasons.

In addition to the two Ramsar sites and one NNR there are 256 County Wildlife Sites and one Local Nature Reserve (LNR). The LEAP area is also home to many threatened species and habitats; the Norfolk and Wash Biodiversity Action Plans (BAPs) will help to develop strategies to protect vulnerable species and habitats.

2.2 Flood Defence and Land Use

2.2.1 Flood Defence

The Tidal River (Great Ouse) is embanked along its entire length within the LEAP area to provide flood defence to the adjacent low-lying land. Parallel to the Tidal River between Denver and King's Lynn is a linear flood storage reservoir called the Relief Channel. This was constructed as

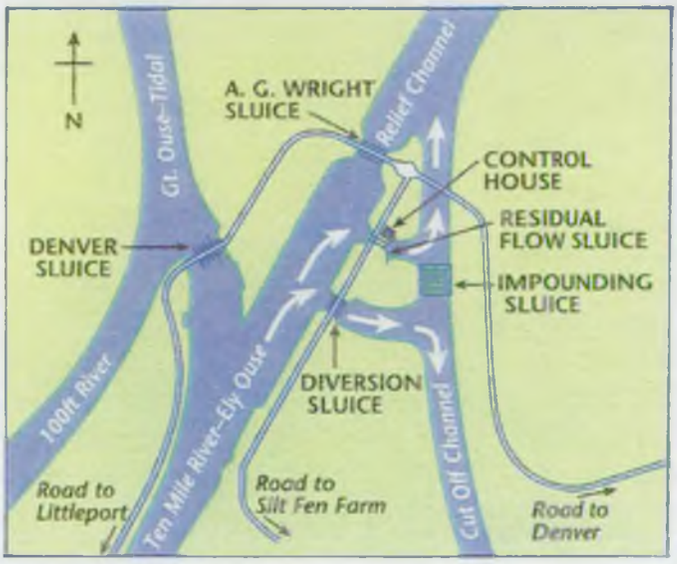
part of the Ely Ouse Flood Protection Scheme. We have 26 km of navigable river under our control and 87 km of sea/tidal defences to maintain.

The Denver Complex, situated just south of Downham Market, is pivotal to the efficient discharge of a number of drainage systems which all interact. A prime objective is to maximise the flow along the Tidal River, as it is the main artery, which impacts on the efficiency of many drainage systems.

Figure 2.1: The Denver Complex

DENVER CONTROL STRUCTURES

- A Denver Sluice
- B A.G. Wright Sluice
- C Impounding Sluice
- D Residual Flow Sluice
- E Diversion Sluice



Coastal Defence

Most of the coastline in the area is low lying (except at Hunstanton, where there are cliffs) and is protected from inundation by the sea by a series of defences. An area of some 300 km^2 is below the highest known tide level and failure of the flood defences could result in extreme danger of flooding and hazard to life. For centuries, King's Lynn and the marshland/fenland areas have been subjected to tidal flooding when wind and sea conditions combine to produce surge tides. In recent times, the two most significant events were those of 1953 and 1978 (see Figure 2.2).

Figure 2.2: 1978 tidal flooding in King's Lynn

Since 1978 there has been significant investment to improve sea and tidal defences. In King's Lynn, there are 53 locations where floodgates or damboards are closed/erected to prevent incursion of high tides or tidal surges (see Figure 2.3). The procedure for closing these involves partnership with King's Lynn & West Norfolk Borough Council, Associated British Ports and Norfolk Police

2.2.2 Agriculture

(Compiled with the assistance of the Farming and Rural Conservation Agency (FRCA))

Agriculture is a vital component of the economy as the majority of the agricultural land is of Grades 1-3 and is therefore of high quality. Crops grown in the area supply both internal and external markets. It is estimated that direct farm employment and employment in ancillary industries (packers, processors, machine manufacturers etc) account for around 10,000 full-time, part-time and temporary jobs in the LEAP area.

Arable cropping is the dominant agriculture type with cereals accounting for 62% of the cropped area and sugar beet/oilseed rape a further 20%. Potatoes and horticulture make up the remainder of the cropped land. Pigs are the most numerous livestock type, although sheep numbers have expanded by nearly 20% in the 10 years to 1997. In the aftermath of the BSE (bovine spongiform encepalopathy) crisis, cattle numbers have fallen by 19%.

Because farmers are also 'custodians' of the countryside, they must reconcile the demand for efficiently and cheaply produced food with the demand for the countryside to be protected and cared for. Government and EU subsidies are available to reconcile agricultural and

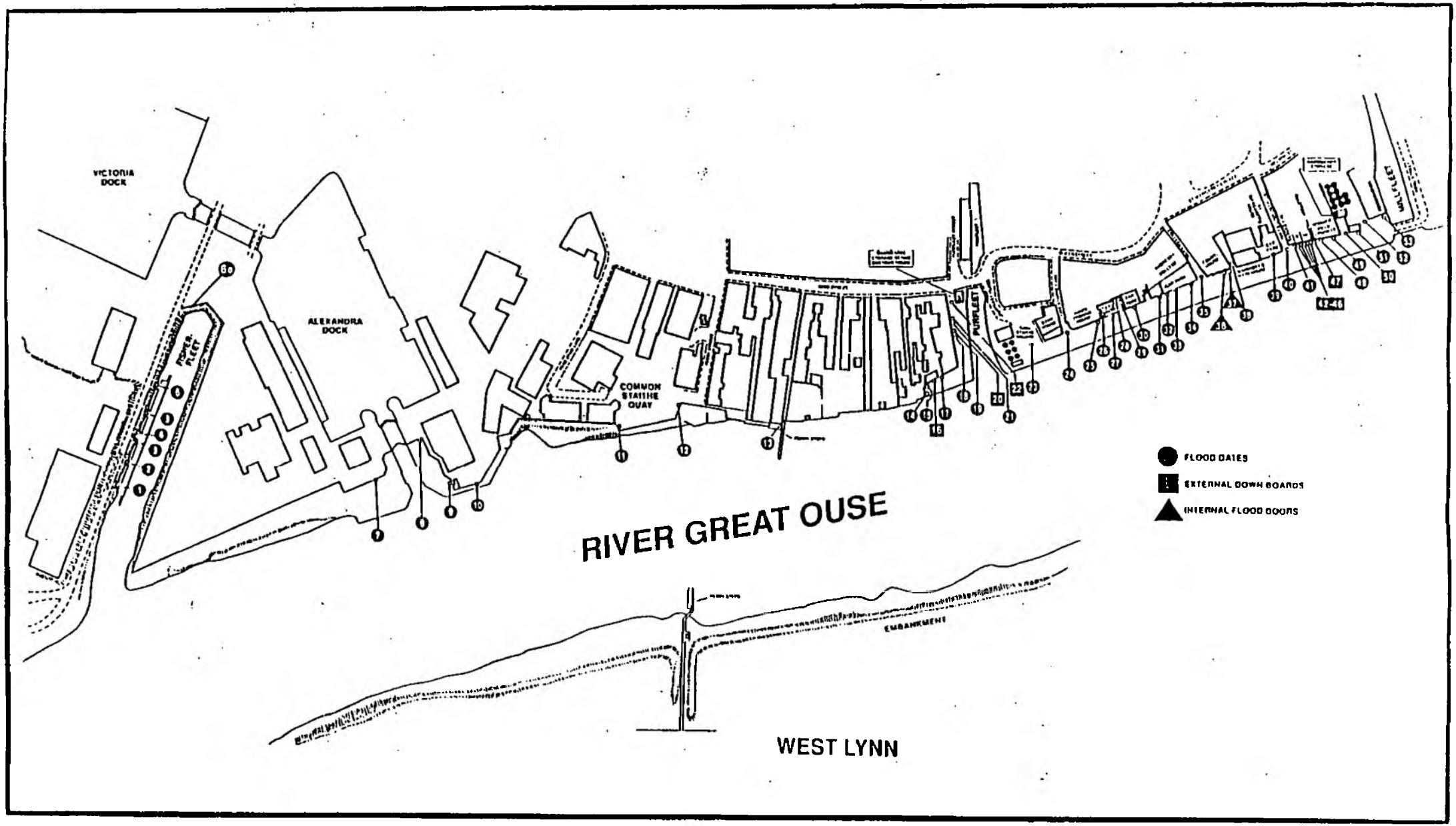


Figure 2.3: King's Lynn Tidal Defences

environmental objectives through a combination of guidance, protection measures and financial incentives. Other initiatives, such as Linking Environment and Farming (LEAF) can promote a whole-farm approach to integrated crop management, providing a basis for efficient and profitable food production that is both economically viable and environmentally responsible.

2.2.3 The Built Environment and Development Plans

Development is guided by Local Plans, which in turn are, guided by Governmental Regional Planning Guidance. The Regional Planning Guidance for East Anglia (RPG6) is currently undergoing a review. The review is based on a Regional Strategy for East Anglia produced by the Standing Conference of East Anglian Local Authorities (SCEALA).

The SCEALA sustainable development strategy is to balance social needs for housing and economic opportunities with the need to conserve and enhance the environment. In principle, this means concentrating new development in existing urban areas, to take advantage of existing infrastructures and to reduce the pressure for Greenfield development. Where this is not feasible, development should be encouraged along existing transport corridors to limit growth of private travel and maximise the use of existing public transport.

The Norfolk Structure Plan and King's Lynn and West Norfolk Borough Plan identify King's Lynn as the major centre for future development. It is envisaged that the town will accept some of the overspill developments from Cambridge, given the strategic nature of the A10 road link and the King's Lynn-Cambridge-London rail link. The Borough Council has proposed redevelopment and expansion of the central area of the town at Boal Quay and Lower Canada. Harding's Pit, Saddlebow Road and North End have been proposed as sites for mixed residential employment and leisure uses in the future. Additional large-scale mixed-use development is proposed at the South Lynn expansion area.

The Local Plan seeks to consolidate the role of Downham Market as a market town serving the surrounding area. Large residential allocations have been made to the north-east, north-west and south of the town and a sizeable area of employment land has been allocated to the south-west.

The aim for Hunstanton is to locate additional developments adjacent to each other so as to maintain the compactness of the town. No significant future development for the part of Wisbech that is in the LEAP area is envisaged in the Fenland Local Plan. The most easterly portion of the LEAP area is within Breckland. This area contains a number of small settlements; however, the Breckland Local Plan makes no development allocations within the settlements.

2.3 Key Biological Populations, Communities and Biodiversity

The LEAP area contains a wide variety of habitats and species of national and international importance. We have been given responsibility as a contact point and/or lead partner for the following:

Habitats

- Chalk rivers*
- Eutrophic lakes*
- Aquifer-fed fluctuating water bodies*
- Salt marshes*

Species:

- Water vole* *(Arvicola terrestris)*
- Otter* *(Lutra lutra)*
- Vendace *(Coregonus alba)*
- White-clawed (native)/Atlantic stream crayfish *(Austropotamobius pallipes)*
- Southern damselfly *(Coenagrion mercuriale)*
- Depressed river mussel *(Pseudonodonta complanta)*
- Shining ram's horn snail *(Segmentina nitida)*
- Little whirlpool ram's horn snail *(Anisus vorticulus)*
- Glutinous snail *(Myxas glutinosa)*
- Freshwater pea mussel *(Pisidium tenuilineutum)*
- River jelly lichen *(Collema dichotomum)*
- Ribbon-leaved plantain *(Alisma gramineum)*
- Greater water parsnip *(Sium latifolium)*
- Marsh warbler *(Acrocephalus palustris)*
- Burbot *(Lota lota)*
- Cut grass *(Leersia oryzoides)*
- Triangular club-rush *(Scirpus triqueter)*

*These habitats/species are present or are believed to be associated with this area

2.4 Compliance with Targets and Standards

2.4.1 Water Quality

We have a national method of classifying the water quality of rivers and canals known as General Quality Assessment (GQA). GQAs of rivers are carried out to provide information at both local and national levels. The chemical GQA is based on three years' analyses; the grade given for a particular river stretch is determined by biochemical oxygen demand (BOD), ammonia and dissolved oxygen (DO) concentrations. Many rivers within the LEAP area are naturally slow-flowing, with the result that background levels of DO are lower than in faster-flowing rivers found in upland regions.

The biological GQA assessment scheme is based on the incidence of groups (taxa) of aquatic macro-invertebrates, such as mayflies, shrimps, beetles and bugs. Macro-invertebrates are good indicators of the quality of a watercourse for several reasons: they have relatively long life cycles, are generally sedentary (stay in the same location), and respond to the physical and chemical characteristics of a river. This means that they will be affected by infrequent pollution incidents (which might be missed by a chemical spot-sample), as well as longer-term improvements/deterioration, and they therefore provide an overall picture of the quality of the river over time.

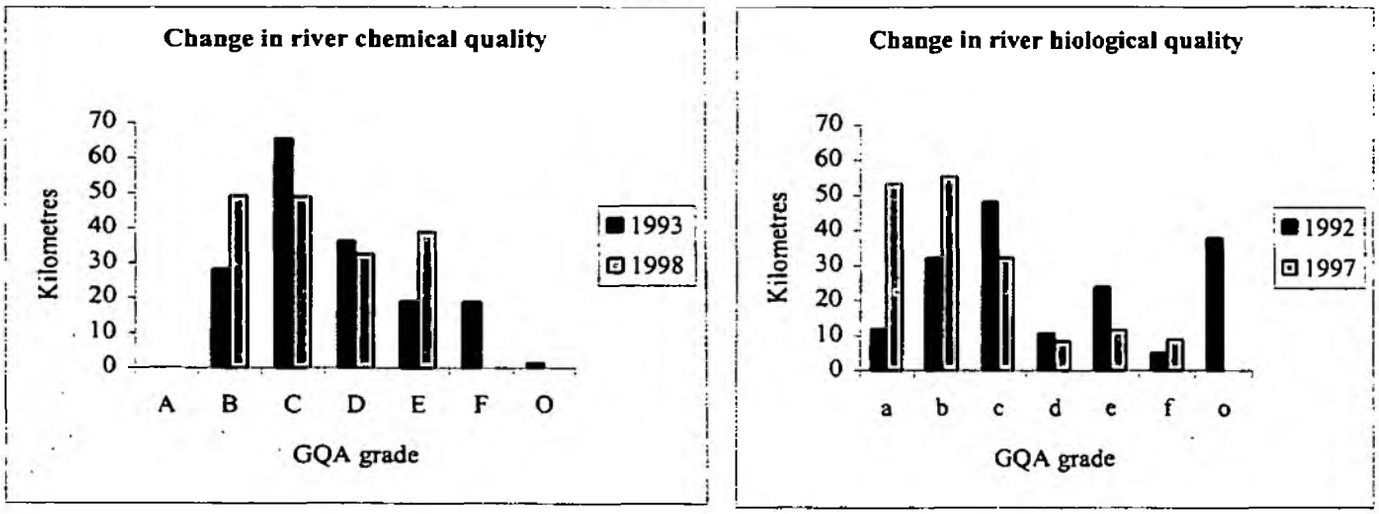
Chemical GQA

The GQA grade O indicates the length of river unclassified in 1993. Since 1993 these stretches have been monitored, resulting in a 1.5 km increase in the length of chemical river quality assessed. Figure 2.4 indicates that there has been a general improvement in the river chemical quality. This includes an increase in the length of grade B rivers and the elimination of grade F stretches.

Biological GQA

There has been an increase of 37.8 km of biological river quality monitored between 1992 and 1997. Figure 2.4 indicates that there has been an increase in the length of river with grades a and b which may in part be due to the increase in assessed lengths.

Figure 2.4: Change in chemical and biological GQA grades



Water Quality Objectives (WQO)

There are five River Ecosystem (RE) classes (RE1-RE5), denoting the different quality of water suitable for fish species. For the three-year period ending March 1999, 70% of river stretches were compliant with their long-term RE targets in the LEAP area. The majority of failures were due to low dissolved oxygen (DO), which can be characteristic of the slow-flowing rivers of the area.

Bathing Water Quality

The two main objectives of the EC Bathing Waters Directive (76/160/EEC) are to improve, or maintain the quality of identified bathing waters for amenity reasons, and to protect public health. The Directive sets imperative and guideline bathing water quality standards for a range of parameters. There are three designated bathing waters in the LEAP; Old Hunstanton Beach, Hunstanton Main Beach and Heacham North Beach. All three beaches complied with the imperative standards in 1998 however, only Old Hunstanton Beach met the requirements of the guideline standards, which although not mandatory we are required to 'endeavour to observe'.

Improvements to Heacham Sewage Treatment Works and Hunstanton storm overflow have been completed by Anglian Water Services Ltd. A storm tank has been installed at Hunstanton to hold up to a 1 in 5 year storm, and ultraviolet disinfection equipment has been installed at Heacham STW, as identified under the second Asset Management Plan (AMP2), to comply with the EC Bathing Waters Directive.

King's Lynn STW has been refurbished and there has been an improvement in the Shellfish Harvesting Classification in the Wash Estuary.

Groundwater Quality

Under the European Directive 676/91/EEC, which is designed to protect water from nitrate pollution from agricultural sources the Government has designated 2 Nitrate Vulnerable Zones (NVZs) in this LEAP area, namely Great Bircham and Swaffham (which overlaps into the Ely Ouse LEAP area). These zones cover the catchments of polluted waters where the nitrate limit of 50 mg/l set by the Directive at public water supply sources has been exceeded or in the case of groundwater, where exceedence is likely in the future. Farmers with land designated in an NVZ are required to implement 'action programme measures' in order to reduce the risk of nitrate pollution. The measures include restrictions on the application of fertilisers and manures. We have been assigned the role of competent authority responsible for assessing the action programme measures.

2.4.2 Summary of Water Resources Status and Expected Trends

Table 2.1 below summarises the main water resources targets and the standards achieved in this LEAP area:

Table 2.1: Water resources targets

TARGETS	STANDARD ACHIEVED
Meet reasonable demands	• There is no evidence that water resource targets for public water supply are not being met. • The 1 in 12 target for spray irrigation is not met, with some irrigation restrictions needed in most drought years in order to protect river flows. • There are no local issues related to the reliability of supply of water for industry, agriculture and other uses.
Protect resources	• Most of the summer surface water resources of this area are considered to be fully committed to existing abstractors and the water environment. Wherever possible, winter abstraction and storage for subsequent use in summer is encouraged. • Water level management plans to be produced and actions prioritised and implemented. • Review of consents to be carried out under the Habitats Directive.
Ensure proper use	• In our opinion, there are sufficient water resources available to support the future development in Norfolk, envisaged by the Structure Plan. Through the planning process, we encourages water saving measures such as leakage control, metering and re-cycling.
Conserve water resources	• The policies for water resources in this LEAP area have already allocated water for the environment. • Climate change to be kept under constant review.

2.4.3 Conservation

To meet our statutory conservation duties and strategic objectives, river corridor and species surveys have been undertaken to describe, classify and monitor the conservation resources of all Main Rivers. The surveys, which include otter, water vole, bird and plant species, enable the biodiversity resource to be assessed and targets set for restoration, enhancement and/or conservation measures.

2.4.4 Air Quality

This is an essentially rural area with the major urban centres being King's Lynn and Downham Market. There are some local concerns with respect to air quality at some locations within King's Lynn. However, it is unlikely that any Integrated Pollution Control (IPC) process would

significantly contribute to any breach of an air quality standard. The effect of road transport and other sources under adverse meteorological conditions are thought to be of more significance.

2.4.5 Integrated Pollution Control

This area is largely agricultural in nature with King's Lynn being the only settlement of any significant size. There are twelve sites that have authorisations issued under the Environmental Protection Act 1990 (EPA90) Part 1; half of them are in the North Lynn area. There are no processes authorised under the IPC regulations beyond the boundary of the area that have a significant effect within the LEAP area.

2.4.6 Radioactive Substances Regulation (RSR)

We are responsible for regulating the storage, use and disposal of radioactive materials through the Radioactive Substances Act 1993 (RSA93), as amended by Environment Act 95. Other legislation concerning radioactivity is regulated through the Health and Safety Executive, with whom we maintain close liaison. There are 20 RSA registrations and one RSA authorisation site in the LEAP area.

2.4.7 Waste

The principal regulatory control for the management of controlled waste in England and Wales is the waste management licensing system under the Environmental Protection Act 1990, brought into force by the Waste Management Licensing Regulations 1994. The regulations provide a system for the licensing of waste recovery, disposal, and treatment operations. The objective of the licensing system is to ensure that waste management facilities do not cause pollution of the environment; do not cause harm to human health; and do not become seriously detrimental to the amenities of the locality.

We routinely inspect waste management licensed sites to ensure compliance with the licence. An inspection would include a thorough examination of the working area, site records, and the condition of pollution control measures.

Due to the rural nature of the LEAP area, there are relatively few landfill sites. There are two major landfill sites, which accept household, commercial and industrial wastes, located at Docking and Blackborough End. The Docking site, however, has been used for waste disposal since the 1950's and is approaching maximum capacity. It is expected to close during 2001.

2.5 The Health of the Aquatic Environment

Fish, invertebrate and plant species are good indicators of the state of rivers and lakes. Healthy and abundant freshwater fish stocks and a diverse invertebrate fauna and plant flora demonstrate our success in meeting water protection and water management objectives. Good water quality, water quantity and habitat are all vital for flora and fauna. The overall objective is to sustain flora and fauna populations appropriate to the river catchment.

The principal coarse fisheries in the area are the Relief Channel, the Middle Level Main Drain and Cut Off Channel. Both the Middle Level Main Drain and the Cut Off Channel support good Class 'B' fisheries (biomass 10-20 g/m^2). The Relief Channel once supported a nationally renowned fishery but suffered serious decline between the late 1970's and the 1990's, highlighting the problems of managing a fishery in a channel engineered for flood alleviation

purposes. We have subsequently undertaken several projects to improve the habitat (see Chapter 4) and are continuing to monitor their success.

The River Nar supports an excellent class 'A' fishery (with a biomass greater than 20 g/m^2) with good populations of brown trout and coarse fish. Similarly, the River Babingley contains a significant breeding brown trout population. Evidence exists in both these rivers of a small run of migratory sea trout. However, access for these migratory salmonids is limited by a number of river spanning structures such as the tidal flaps at their confluence with the Tidal River.

Limited coarse fish populations exist in the smaller Norfolk rivers; these include the Heacham, Ingol, Babingley, Gaywood and the Middleton Stop Drain.

2.6 Aesthetic Quality

2.6.1 Landscape

Man's influence on the appearance of the landscape has been extensive, through erecting dwellings, clearing and farming land and forming routes in the countryside to link settlements. This has resulted in a rich heritage of historic, domestic and industrial buildings, monuments and flood defence structures in Norfolk. These include imposing country mansions, fine monuments and churches, ancient burial grounds, farm buildings, windmills, Roman forts, pill boxes and more modest houses and cottages.

The landscape of this LEAP area is composed of several distinct types. The current state of the landscape has been assessed and classified into Character Areas by the Countryside Commission. A character area is a geographic area with a distinct pattern or combination of landscape elements that occurs consistently within a defined area. A summary of the character areas is given in Table 2.2:

Table 2.2: The character of the North West Norfolk LEAP area

Character Area (No)	Natural Area (No)	Character Area Description
The Fens (46)	The Fens (37)	The Fens cover at least 50%' of this LEAP area '...low-lying rarely reaches 10 m above sea level' ... 'open panoramas and expansive skies' ...'Predominantly cultivated with little natural or semi-natural habitats remaining.'...
North West Norfolk (76)	North Norfolk (47)	North West Norfolk '...large-scale arable grassland landscape and big rolling uplands ..... with views over remnant heath and large belts of mixed woodland...Huge estates.... large widely-spaced villages.'...
Mid Norfolk (84)	East Anglian Plain (50)	Mid Norfolk '.....predominantly arable, variable field sizes, relatively well wooded. Dispersed villages, isolated farm houses.'
Breckland (85)	Breckland (46)	Breckland '.... distinctive large-scale landscape of arable fields or open heath..... Vast commercial conifer plantations.... Long history of settlement.....sparsely populated'

2.6.2 Navigation

The Tidal River is the only navigable river in the LEAP area at present under our control, although its strong currents mean that it is usually only navigable to large boats. We control navigation between Denver and Stowbridge; downstream of Stowbridge, navigation is controlled

by the King's Lynn Conservancy Board (their jurisdiction also extends into the Wash). The Tidal River provides an important link with the Ely Ouse system and also (via Well Creek and the Old Bedford River) with the Nene waterways.

We are currently in discussion with Government Office East of England regarding funding opportunities. Of particular interest is the possibility of using the Relief Channel as a non-tidal link to King's Lynn by building a lock at Denver. By providing this safe and sustainable navigable route between Denver and King's Lynn, the project would create an additional 17 km of navigable waterway and enhance leisure and tourism opportunities along the channel. We are also exploring additional opportunities for navigation through our involvement in the Fen Waterways Regeneration Partnership.

2.6.3 Recreation & Amenity

Popular recreational activities include walking, angling, caravanning, camping, boating, sailing and water-skiing. Tourism is actively encouraged by Local Authorities and the West Norfolk Tourism Strategy 1999-2003 (produced by the Borough Council of King's Lynn and West Norfolk) which aims to promote and develop West Norfolk as a destination for visitors. Popular tourist attractions include the RSPB reserve at Snettisham, Sandringham Country Park, Hunstanton and King's Lynn Hanseatic Port. In addition, we are working with a number of organisations on the North Sea Haven Millennium project based at King's Lynn. This project, which includes the creation of Green Quay environmental visitors' centre, aims to raise public awareness of the history and conservation value of The Wash area.

Local footpaths include the Norfolk Coastal Path, the Nar Valley Way, the Peter Scott Walk (around the Wash), the Peddars Way and the Fen Rivers Way. We are also working in partnership with other organisations to fund the Fen Access Project, which aims to create new and enhanced access and recreation opportunities within the unique landscape of the Fens.

Angling and coarse fishing are widely practised in the LEAP area. Coarse fishing is popular on rivers such as the Relief Channel, the Cut Off Channel, the Middle Level Main Drain and the Nar. Roach and bream are the most commonly caught species, although pike and zander are fished for on some of the larger channels. Some salmonid fishing for trout is available on the Nar and former gravel workings in the Nar valley provide diverse fishing opportunities. The needs of disabled anglers are well catered for in North West Norfolk; the West Norfolk Disabled Anglers' Club in King's Lynn offer excellent facilities.

Sailing and water-skiing take place on the Relief Channel and in flooded gravel pits such as Leziate/Bawsey, Woods Lake and Abbey Road Pits. Camping and caravan sites are found close to the popular coastal resort of Hunstanton. Other camping sites and beach huts exist at Heacham and Snettisham and a notable inland camping and recreation centre is located at Wood Lakes, near Stowbridge.

2.7 Environmental Overviews

More detailed accounts of the State of the Environment for the North West Norfolk area can be found in the Norfolk Environmental Overview and Norfolk Environmental Overview Supplement. These documents are available free of charge from the address given on the inside front cover.

2.8 Socio-economic considerations

We are required to have regard to any effect that our proposals would have on the economic and social well-being of local communities in rural areas. This is particularly relevant for this LEAP area where the local economy depends on farming and ancillary industries.

Rural Development Areas are those where assistance is available for projects which strengthen and diversify the local economy, support and diversify the agricultural economy, develop tourism, improve training and access to employment, sustain rural communities and sustain and improve the environment.

The East of England Development Agency (EEDA) will be influential in shaping the future development of the LEAP area and the remainder of its region – the six counties of Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk. We are participating in shaping EEDA's emerging economic development strategy by raising key environmental issues and opportunities and promoting itself as a partner organisation working towards achieving sustainable development.

Rural Development

The Countryside Agency (which was formed on 1st April 1999 from the amalgamation of the Countryside Commission and Rural Development Commission) initiated the Norfolk Land Management Initiative (NALMI). It is supported by us, Morley Research Centre, the National Farmers' Union (NFU), the Farming and Wildlife Advisory Group (FWAG) and Norfolk County Council. Comprising 13 parishes and encompassing 157 farms on the boundary between the Central and Eastern Areas of our Anglian Region, the NALMI area includes the headwaters of four river systems. The aim of the NALMI project is, through a full-time project officer, to promote and enhance social, economic and environmental aspects of a rural area. It will operate using existing stewardship schemes, helping farmers and others to tap into available sources of help, but it will also be looking for innovative ways of resolving rural issues.

CHAPTER THREE – ISSUES AND OPTIONS

In the following pages, issues are listed that have been highlighted through investigation of the LEAP area and through internal and informal external consultation. The proposed actions to resolve the identified environmental issues are also presented.

3.0 Introduction

The concept of integrated environmental management began with the introduction of the former National Rivers Authority's catchment planning initiative, which addressed water-related issues. LEAPs were introduced to build on that initiative, taking a fully integrated approach to all facets of the environment and replacing the Catchment Management Plans (CMPs) previously produced.

As scheduled in the Agency's national programme, the North West Norfolk Draft LEAP is the last consultation document to be published in Central Area, which means that all CMPs for this Area have now been superseded.

To qualify as an Agency "issue", each must, as laid down in internal LEAP guidance, be SMART – *S*pecific (general issues such as "Rivers are polluted" are not allowed), *M*easurable (e.g a river is not meeting chemical standards), *A*greed (the issue must be widely recognised), *R*ealistic (resolving the issue must be a practical possibility) and *T*imetabled (steps taken to resolve the issue must have a clear timetable). Each issue has been linked to one or more of the nine themes, as set out in the Agency-published document *An Environmental Strategy for the Millennium and Beyond* (September 1997). These nine themes are:


Addressing climate change


Regulating major industry


Improving air quality


Managing waste


Managing our water resources


Delivering integrated river basin management


Conserving the land


Managing our freshwater fisheries


Enhancing biodiversity

This strategy recognises the need to manage the environment in a holistic way and the value of developing partnerships.

It is hoped that you will give us your views on these issues during the consultation period, which runs until 4th April 2000.

3.1 The North West Norfolk LEAP Stakeholder Group

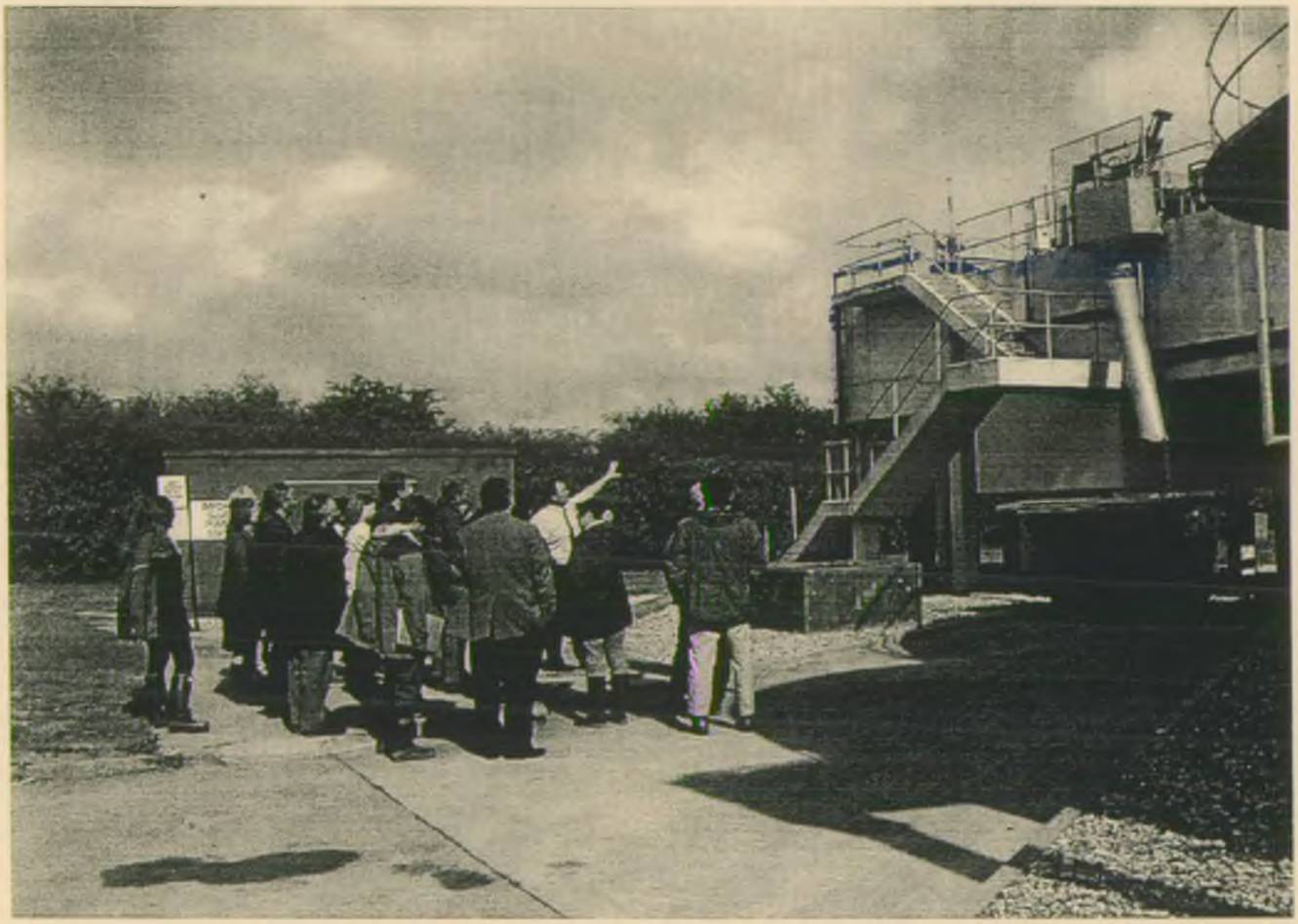
During the production of the North West Norfolk LEAP, we are involved in a collaborative trial project with the Environment and Society Research Unit (ESRU) of University College London's Department of Geography. The principle of the project was to benefit from the involvement of key environmental stakeholders during the production of the Draft LEAP. The aim of the Stakeholder Process was to identify the environmental issues and to prioritise them in terms of their local importance. The prioritised list has been included in this Draft LEAP (see tables 3.3 and 3.4) for external consultation and comment, as normal. The stakeholder process was independent (and additional to) the normal work of the North West Norfolk LEAP Area Environment Group (AEG) Sub-Group, although a number of AEG members were also members of the Stakeholder Group. The selection onto the Stakeholder Group of people with little or no

previous experience of the LEAPs process was thought likely to be particularly beneficial to the process.

23 of the 37 organisations and individuals invited to join the Stakeholder Group accepted. A list of the stakeholders is included in Appendix D.

The Stakeholder Process was composed of four workshops: the first was a field visit to highlight potential environmental issues (Figure 3.1 below shows the visit to King's Lynn Sewage Treatment Works); the second identified the issues and the criteria to prioritise the issues; the third applied the top 12 criteria (as voted by the group) to the issues to produce the prioritised issue list; and the fourth finalised the prioritised issue list and discussed any anomalies prior to considering the strengths and weaknesses of the process as a whole.

Figure 3.1: Stakeholder Group visit to King's Lynn Sewage Treatment Works



The Stakeholder Group identified 31 issues that require action, as detailed in this chapter. Some issues were brought forward from the CMP as they remained unresolved and six new issues emerged from the Stakeholder process. One issue (Issue 21) emerged some weeks after the final Stakeholder Group meeting and is therefore not prioritised. In addition, a number of Agency-generated issues were altered in the light of Stakeholder Group comments and suggestions.

Tables 3.3 and 3.4 at the end of this chapter show the results of the prioritisation procedure. The Flood Defence issues are listed separately for the following reasons:

- Because the majority of the criteria used were more 'environmental' than 'economic' and 'social' in content, the importance of some of the Flood Defence issues was devalued; and
- The Flood Defence budget is raised locally by the Local Flood Defence Committees against Flood Defence maintenance needs and capital projects identified in the Long Term Plan. The budget of the Agency's other functions is derived primarily from Central Government funds in the form of Grant in Aid from the Department of the Environment, Transport and the Regions (DETR). All functions except Flood Defence are therefore in competition for a share of the same pot of money.

After the end of the consultation period (4th April 2000), the Stakeholder Group will meet again to discuss the consultation responses and finalise the content of the LEAP, when the issue actions will be timetabled and costed.

It must be stressed that the prioritised list produced by the stakeholder group is by no means final or a *fait accompli*. You are invited to comment on the priority order and the content of the issues, make suggestions for new issues and the layout of the document and submit any other comments on the Draft LEAP, as is normal. As this is the first time we have used the Stakeholder Process for a Draft LEAP, we would also be interested to hear your thoughts on the whole question of prioritising LEAP issues.

3.2 Summary of issues

The North West Norfolk CMP highlighted 64 issues of concern. Four years on, 28 of these issues remain unresolved. All have been brought forward into the LEAP, although a number have now been combined as a result of revised internal guidance for LEAPs. The Annual Review identified six new issues; all but one of these has been carried forward into the LEAP. The sixth issue (*Proposal for the expansion of King's Lynn Power Station*) is, because of a Government moratorium on new gas-fired power stations, not being progressed currently. Our routine work encompasses many of the other issues that were highlighted in the CMP and they are discussed in Chapter 4 – *A Better Environment Through Partnership*. All of the issues included in the Draft LEAP are listed in Table 3.1. Each issue is associated with one or more of our environmental themes, as indicated in Table 3.2. Site specific issues are shown on Map 3.1.

Table 3.1: Issues list

Issue no.	Issue title	Issue no.	Issue title
	MANAGING OUR WATER RESOURCES	16	There is concern over eutrophication of the Great Ouse estuary
1	The demand for water during the summer can often exceed available resources	17	Groundwater is vulnerable to pollution
2	A better understanding of the water balance of the LEAP area is required	18	Hunstanton Main and Heacham North beaches fail to meet guideline bathing water quality standards
3	A better understanding of the water requirements of the environment and the impacts of abstraction is needed	19	There is a failure to meet environmental quality standards
4	The allocation of the water resources and the licensing policy require restating	20	There is concern over the impact of poor water quality on the River Nar SSSI
	ENHANCING BIODIVERSITY		**NEEDS FOR MONITORING AND FURTHER INVESTIGATION**
5	There is concern over the impact of engineering works on riverine habitat diversity	21	There is concern over the air quality in North Lynn
6	There is a need to assess and, where appropriate, protect the ecological status of headwaters		**IMPROVING FLOOD DEFENCES**
7	BAP targets specific to the LEAP area are unknown	22	Sea defences at Sea Banks East (Wolferton to Snettisham) need re-profiling
8	There is a need to reassess the mowing regime of river banks to minimise disturbance to wildlife	23	There is concern that tidal defences between Hunstanton and Snettisham provide inadequate protection from flooding
9	There is a need to protect habitat outside designated areas	24	There is the potential for King's Lynn (South Quay) tidal defences to be compromised
10	There is concern over the impact of river structures on sea trout populations in the rivers Nar and Babingley	25	There is concern over the impact of siltation on flood defences and navigation in the Tidal River
11	There are problems with fish being pumped out of the Middle Level System during times of high flows	26	Water Level Management Plans need to be completed
12	There is an absence of grayling in the River Nar	27	The future of Snettisham Beach groynes needs to be evaluated
	ENJOYMENT OF THE WATERWAYS	28	There is a need to meet Bye Report Actions for improving flood defences to the specified deadlines
13	There is a need to improve recreational and navigation access to Agency-owned land on the Relief Channel and Cut Off Channel	29	There is an inadequate level of flood defence protection on the River Nar
	MANAGING WASTE	30	The use of managed realignment as part of the coastal defence strategy in the east of the Wash needs to be evaluated
14	There is concern over environmental impacts of Blackborough End waste management sites	31	Proposed development behind River Nar flood defences is of concern because of insufficient flood protection
	RISKS TO WATER QUALITY		
15	A number of river stretches fail to meet their River Ecosystem targets		

Table 3.2: LEAP issues and environmental themes

	Theme								
Issues	**Theme 1:** Addressing Climate Change	**Theme 2:** Regulating Major Industries	**Theme 3:** Improving Air Quality	**Theme 4:** Managing Waste	**Theme 5:** Managing Water Resources	**Theme 6:** Delivering Integrated River Basin Management	**Theme 7:** Conserving The Land	**Theme 8:** Managing our Freshwater Fisheries	**Theme 9:** Enhancing Biodiversity
1					✓				
2					✓	✓			
3					✓	✓			✓
4					✓	✓			
5						✓			✓
6						✓			✓
7									✓
8						✓			✓
9									✓
10								✓	
11						✓		✓	
12								✓	
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17					✓	✓	✓		
18						✓			
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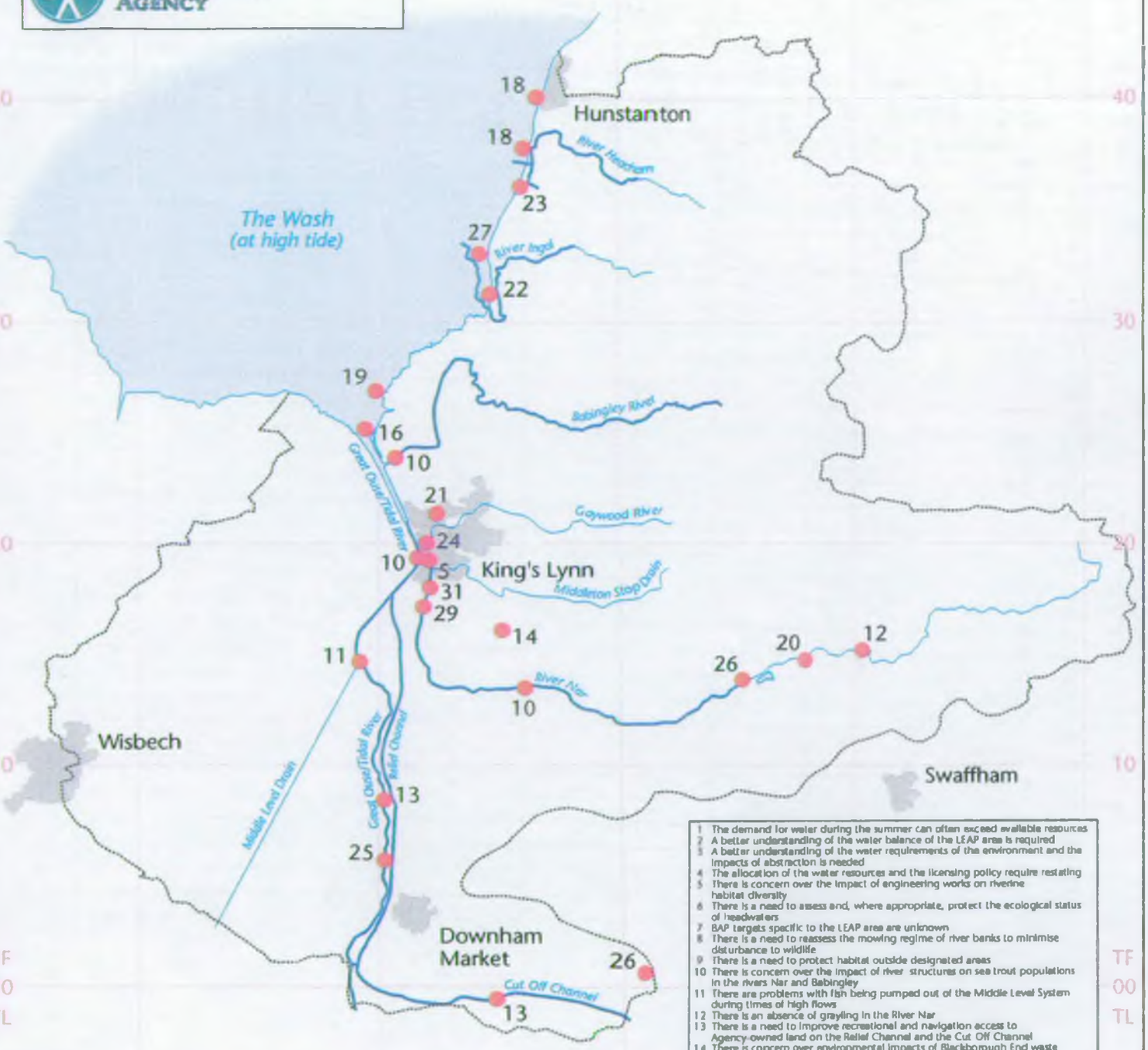
20						✓	✓		✓
21		✓	✓						
22						✓	✓		
23						✓	✓		
24						✓	✓		
25						✓			
26						✓			✓
27						✓	✓		
28						✓	✓		
29						✓	✓		
30	✓						✓		
31							✓		

North West Norfolk Local Environment Agency Plan Map 3.1

ENVIRONMENT AGENCY



Issues

KEY

- LEAP boundary
- Main river
- Non-main river
- Built up areas
- Issue location

N

0 10km

1 The demand for water during the summer can often exceed available resources
2 A better understanding of the water balance of the LEAP area is required
3 A better understanding of the water requirements of the environment and the impacts of abstraction is needed
4 The allocation of the water resources and the licensing policy require restating
5 There is concern over the impact of engineering works on riverine habitat diversity
6 There is a need to assess and, where appropriate, protect the ecological status of headwaters
7 BAP targets specific to the LEAP area are unknown
8 There is a need to reassess the mowing regime of river banks to minimise disturbance to wildlife
9 There is a need to protect habitat outside designated areas
10 There is concern over the impact of river structures on sea trout populations in the rivers Nar and Babingley
11 There are problems with fish being pumped out of the Middle Level System during times of high flows
12 There is an absence of grayling in the River Nar
13 There is a need to improve recreational and navigation access to Agency-owned land on the Relief Channel and the Cut Off Channel
14 There is concern over environmental impacts of Blackborough End waste management sites
15 A number of river stretches fail to meet their River Ecosystem targets
16 There is concern over eutrophication of the Great Ouse estuary
17 Groundwater is vulnerable to pollution
18 Hunstanton Main and Heacham North beaches fail to meet guideline bathing water quality standards
19 There has been a failure to meet environmental quality standards (EQS) for tributyl tin in the Great Ouse estuary
20 There is concern over the impact of poor water quality on the River Nar SSSI
21 There is concern over the air quality in North Lynn
22 Sea defences at Sea Banks East (Wolferton to Snettisham) require re-shoring and re-profiling
23 There is concern that tidal defences between Hunstanton and Snettisham provide inadequate protection from flooding
24 There is the potential for King's Lynn (South Quay) tidal defences to be compromised
25 There is concern over the impact of siltation on flood defences and navigation in the Tidal River
26 Water Level Management Plans need to be completed
27 The future of Snettisham Beach groynes needs to be evaluated
28 There is a need to meet Bye Report actions for improving flood defences to the specified deadlines
29 There is an inadequate level of flood defence protection on the River Nar
30 The use of managed realignment as part of the coastal defence strategy in the east of the Wash needs to be evaluated
31 Proposed development behind River Nar flood defences is of concern because of insufficient flood protection

Issues 1-8, 9, 15, 17, 23 and 25 are non site specific

MANAGING OUR WATER RESOURCES

We seek to manage water resources in a sustainable manner to balance the needs of the environment with the needs of abstractors. We monitor river flows, groundwater levels, rainfall and climate to assess the available water resource. We issue abstraction licences if there is sufficient water available, the need for water is justified, all rights of existing users are protected and the water environment (rivers and wetlands) is not unacceptably affected.

We are committed to reviewing our Water Resources Strategy by December 2000. The revised Strategy will consider water demands and supply until 2025. It will highlight the need for us to work together with water companies, OFWAT, Local Authorities, the farming community, and industry to ensure efficient water use and protection of the water environment.

We intend to issue Catchment Abstraction Management Strategies (CAMS), separate from LEAPs, which will describe the abstraction polices for LEAP areas. The CAMS will be drawn up in consultation with interested parties. This concept was part of the DETR review and does not require a change in legislation. We have drawn up a programme, which includes national trials of the concept in 1999, formal consultation in 2000 and production of local CAMS documents commencing in 2001.

Issue 1: The demand for water during the summer can often exceed available resources

This issue was partly covered in the CMP as *The availability of water resources in the catchment*. Our current assessment of the summer surface water resources and the groundwater resources of most of the chalk aquifer is that they are fully committed to existing users and the water environment. Therefore, any application for more groundwater from the chalk (the Nar unit and the Babingley/Gaywood unit), or summer surface water, over and above what is currently licensed, cannot be recommended. This implies future development (housing, industry and farming) could be limited when existing licences become fully utilised, without alternatives being undertaken such as more efficient use of current resources or import of new supplies.

This situation has led to increased demand for water from the Norfolk Greensand aquifer and winter storage of surface water, and this in turn has led to new concerns which are discussed in Issue 2.

These proposals are also significant because of climatic change. Most current scenarios predict that summers will become warmer and drier and winters wetter and stormier. The combination of these possible effects would put greater demands on the water resources, which emphasises the need for careful management now and in the future.

The following proposals are not exclusive, and it may be necessary to pursue more than one:

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Reduce demand by encouraging metering, recycling and more efficient use in homes and industry through the planning liaison system, waste minimisation schemes and ISO 14001 accreditation	Leads to better management of limited water resources Lower costs for water users Minimises environmental impacts associated with the use and development of water resources	Costs of supplying water saving devices such as meters, low-flush toilets and water butts The Agency has no statutory powers to regulate efficient use	Agency Water companies Local Planners Developers Industry All water users	
2. Encourage efficient irrigation techniques and equipment, especially during drought conditions (e.g. by requesting night-time irrigation)	Maximises efficiency of water use especially during periods of limited availability Minimises environmental impacts associated with the use and development of water resources	Night-time irrigation may be inconvenient or impractical for farmers Latest irrigation technologies may be expensive for farmers	Agency Farmers MAFF	
3. Store water from rivers in reservoirs during times of high flow, or use techniques such as storing water in the aquifers, as appropriate	Housing, industry and farming not constrained by the supply of water Better management of limited water resources Impact of abstraction is reduced, as there is surplus water available Lower abstraction charges Potential to create habitat of ecological interest in some cases	Costs of development of reservoir/storage facility Possible environmental impacts of reduced winter flows Limited opportunity for storing water in the aquifers due to the geology of this LEAP area	Agency Water companies Farmers Industry MAFF	
4. Redistribute water from areas of surplus to areas of deficit. This is a general concept that we support, and could be at any scale, from local farm level to UK-wide. It could also apply to mains water or untreated water and be via pipelines or river-to-river.	Housing, industry and farming not constrained by the supply of water Better strategic management of limited water resources	Financial costs of transfers (e.g. electricity) Environmental 'costs' of river-to-river transfers, such as transfer of non-native species and changes to water temperature and chemistry Higher abstraction licence charges for supported licences	Agency Water companies Farmers Industry	

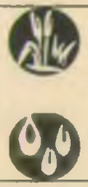
PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
5. Continue to utilise resources of the Norfolk Greensand aquifer (refer to Issue 2)	Permits development if required May save costs	Does not encourage efficient use of water Recharge mechanisms not well understood, so impacts of increased abstraction are uncertain and need monitoring	Agency Water companies Industry Farmers	
6. Do nothing	Cheapest option for Agency	Inefficient use of available resources Lack of water might restrict housing, industry and farming		

Issue 2: A better understanding of the water balance of the LEAP area is required

This issue follows on from Issue 1 (*The demand for water during the summer can often exceed available water resources*). It was identified in the CMP as an activity under the issue *The availability of water resources in the catchment* and it is fundamental to the other water resources issues in this LEAP area. To enable the best management of the limited water resources, it is very important that we continue to improve our understanding of the amount of water available in this river catchment, and the complex way it interacts in the environment.

The following proposals are not exclusive, and it may be necessary to pursue more than one:

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Develop a groundwater investigation and modelling strategy	Will help re-establish the water resources of the aquifer units underlying this LEAP area Will aid our understanding of the behaviour and movement of the groundwater in the area, in particular the recharge mechanisms of the Norfolk Greensand aquifer, and interactions with the chalk aquifer Will help establish the likely effect of current and future licensing, in particular groundwater abstraction on rivers, springs and wetlands (linked to Issue 3) Will be used as a planning tool to help determine future policy for resource licensing (linked to Issue 4)	A groundwater strategy will take at least 5 years to develop and therefore will not change licensing policy immediately Cost to the Agency	Agency	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Undertake a review of the groundwater level observation borehole network	Improves the monitoring capability, which helps in the understanding of groundwater behaviour	Resources and cost to the Agency	Agency	
3. Review the flow monitoring requirements of the area	Identifies requirements for new flow monitoring stations Leads to improved data availability to aid understanding	Resources and cost to the Agency	Agency	
4. Do nothing	Cheapest option for the Agency	Understanding is not improved, and improvements to policies and procedures cannot be made		

Issue 3: A better understanding of the water requirements of the environment and the impacts of abstraction is needed

Part of this issue was referred to in the CMP as *Balancing abstraction against in-river needs*. It has been brought forward into the LEAP as it is a continuous process. In addition, within the timescale of the last CMP, a new European Directive has been implemented (the Habitats Directive), which introduces new duties for the Agency in the protection of certain cSACs and SPAs. This issue also has links with Issues 1 and 2 to enable the continued proper management of the conflicting demands for water resources, and Issue 26 (*Water Level Management Plans need to be completed*).

The Agency is responsible for assessing the availability of sustainable water resources and only allocating water for abstraction when there are no adverse effects on the water environment. Our present policies do already reserve water for the environment, but we are aware that research is required to enable a more detailed understanding of the environment's requirements. This is not exclusively an issue of water resources, but involves advice from other Agency functions such as Fisheries, Ecology and Recreation (FER).

The following proposals are not exclusive, and it may be necessary to pursue more than one:

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Review the current research into methodologies to assess in-river needs and undertake studies for the rivers in the LEAP area	Will improve understanding of in-river requirements Will enable better protection for in-river needs Will lead to open and equitable catchment-based licensing policies	Resources and cost to the Agency	Agency	
2. Increase knowledge of wetland sites by monitoring of East Walton & Adcocks Common SSSI, Dersingham Bog SSSI, Roydon Common SSSI / Ramsar site and Leziate, Derby and Sugar Fen SSSI	Enables collation of data necessary to understand the behaviour of water on important wetland sites Will enable future identification of protection zones for wetlands	Resources and cost to the Agency involved in undertaking studies Possible relocation/ alternative abstraction sites may be needed.	Agency	
3. Undertake review of consents affecting the Norfolk Valley Fens cSAC (East Walton and Adcocks Common SSSI) and Roydon Common & Dersingham Bog cSAC (Roydon Common SSSI/Ramsar site and Dersingham Bog SSSI) as required by the Habitats Directive	Identifies potentially damaging abstractions Improves protection for important conservation sites Can improve our understanding of wetland sites	Resources and cost to the Agency and English Nature May lead to potential constraints on development near important sites	Agency English Nature	
4. Undertake a wetland framework study to develop an understanding of the links between environmental characteristics of wetland sites and their biota, by analysis of existing databases	Enables assessment and prediction of the impacts of certain environmental changes on particular types of wetland Assists with the Habitats Directive review of consents process Develops a practical and conceptual understanding	Resources and cost to the Agency	Agency Sheffield University English Nature	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
5. Carry out investigation and monitoring of sites potentially affected by public water supply abstraction (Wash and North Norfolk Coast) which is part of the environment programme agreed by OFWAT (AMP 3)	Improves understanding of impacts of abstraction Leads to better protection of important wetland sites and estuaries	Resources and cost to Essex and Suffolk Water Company	Essex and Suffolk Water Company Agency	 
6. Continue involvement with monitoring of environmental significance of flows to tide in the Wash (associated with the temporary reduction in the minimum residual flow conditions at Denver)	Helps improve our understanding of any impacts of the transfer scheme, in particular due to the temporary 5 year variation to the minimum residual flow	Resources and cost to all interested parties Residual flows to tide at certain times of the year may need to be increased	Essex and Suffolk Water Company Agency Other interested parties	  
7. Do nothing (this is not an option for the Habitats Directive review of consents)	Cheapest option for Agency	Knowledge and understanding are not improved		

Issue 4: The allocation of the water resources and the licensing policy require restating

The issue was raised by the internal LEAP Project Team. This issue will be the final stage following on from Issues 1 to 3 discussed above, where increased knowledge will influence the way in which we manage the water resources. Although the issue is new to this LEAP, it incorporates activities and proposals that have been - and continue to be - a regular part of our Water Resources work.

It is also linked to the recent DETR review of the abstraction licensing legislation. This Government review recommends changes which, amongst other things, provide the Agency with the additional tools to undertake its role to manage water resources, increases the scope of and public availability of information on water resources and includes measures to strengthen protection for wildlife and important habitats. Some of the outcomes do not require legislative change and the Government has asked the Agency to pursue these immediately. Other outcomes will require legislative change and the Government will seek to carry through these changes over the next couple of years.

The proposals listed below will be progressed in tandem with the proposals set out in Issues 1-3:

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Produce a management strategy for the water resources in the light of issues 1 to 3 and consult and publish in the form of Catchment Abstraction Management Strategies (CAMS)	The policy for allocation of resources is reviewed Information about the process is more publicly available A strategy for future licensing policy is identified	Resources and cost to the Agency	Agency	
2. Update the Regional Water Resources Strategy	Future supply and demands for water are outlined, and policies reflect the most recent research and development The process will involve external consultation to gain the views of key stakeholders	Resources and cost to the Agency	Agency	
3. Implementation of any revised legislation as directed by the Government	Legislative changes will strengthen protection for wildlife and important habitats	Resources and cost to the Agency	Agency	
4. Investigate the need for any works in the catchment (e.g. relocation of effluent discharges, in-channel works like weirs, river support boreholes etc)	Management of the water resources in the catchment could be improved	Resources and cost to the Agency	Agency	
5. Do nothing (this will not apply to the first three proposals)	Cheapest option for Agency	Water resource management is not improved in light of increased knowledge and understanding		

ENHANCING BIODIVERSITY

Biodiversity, the variety of life on Earth, is thought to be declining at an alarming rate. In the UK alone, more than 100 species are believed to have become extinct this century.

The government's contribution to maintaining and enhancing biodiversity is being delivered at a national level through the UK Biodiversity Action Plan (BAP), published in 1994. This publication identifies and sets targets for those species and habitats considered both rare and in decline. The Agency is the contact/lead for 17 species and 4 habitats as discussed in Chapter 2.1.3: *Key Biological Populations, Communities and Biodiversity.*

Biodiversity will be a key indicator of the successful implementation of sustainable development in a plan area. The national BAP targets will be delivered at a county level and undertaken by environmental organisations, including the Agency and Local Authorities. (For more information refer to Chapter 4.2: *Local Agenda 21 and Biodiversity Plans.*)

Issue 5: There is concern over the impact of engineering works on riverine habitat diversity

This issue encompasses three issues from the CMP relating to lack of habitat and species diversity in rivers and their floodplains within the LEAP area (*Degraded rivers, River corridor buffer zones* and *Habitat improvements to the Relief Channel).* Those separate issues have been combined to create this one issue.

Until recently, river management was driven largely by agricultural policies to improve drainage and reduce the risk of flooding, thus maximising the production of cereals. These activities have resulted in the straightening and deepening of many river channels, leading to changes in many in-channel and floodplain habitats. Recent changes in land use, as a result of the Common Agricultural Policy initiatives, provide an opportunity to restore the ecology of sections of river, using a variety of techniques, where this does not undermine land-use in the floodplain.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Identify where buffer zones alongside rivers can be established	Reduced damage to banks by stock and farm machinery	Cost to the Agency	Agency FRCA	
2. Identify the most degraded river reaches through analysis of River Environmental Database (REDS) and River Habitat Survey (RHS)	Specific targeting of resources	Resources and cost to the Agency	Agency	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
3. Identify opportunities to enhance habitat diversity during flood defence works	Nature conservation benefits Reduced cost to the Agency	Resources and cost to the Agency	Agency	
4. Creation of slack water refuge areas for fish and invertebrates in trapezoidal river reaches	Improved habitat diversity Fulfil Fisheries duties	Cost to the Agency/landowners/ angling clubs	Agency Landowners Angling clubs	
5. Restore flooding to the natural floodplain by identifying areas where flood control measures could be relaxed	Improved habitat diversity Flood meadow storage of water	Cost to the Agency	Agency FRCA FWAG Local Authorities Landowners	
6. Implement actions for rivers and wetland BAP (see also Issue 7)	Achievement of BAP habitat and species targets	Cost/resources to the Agency	Agency English Nature Local Authorities Landowners Wildlife Trusts RSPB	
7. Do nothing	Cost to the Agency	Degraded habitat and landscapes		

Issue 6: There is a need to assess and, where appropriate, protect the ecological status of headwaters

This is a new issue that arose through the internal LEAP Project Team. Headwaters contribute significantly to the biodiversity of rivers. There are, for example, many macro-invertebrates (some of which are rare), that are exclusive to, or are predominantly found in, headwaters. Our knowledge of the status of headwaters is very limited, as is our understanding of the impact of agricultural practices, water quality and resource issues. This issue links into Issue 3 (*A better understanding of the water requirements of the environment and the impacts of abstraction is needed*). The Agency has a lead role in protecting chalk rivers (e.g. rivers Nar and Babingley), that often support unique flora, fauna and fish populations.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Assess the level of data on headwaters and identify priorities for completing species level surveys of selected headwaters	Fulfilment of Conservation duties Protection of chalk riverine biodiversity	Cost to the Agency/ English Nature	Agency English Nature	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Identify a strategy for the protection of headwaters	Fulfilment of conservation duties Protection of chalk riverine biodiversity	Cost to the Agency/ English Nature	Agency English Nature	
3. Do nothing	Cost to the Agency	Risk of further loss of conservation importance of headwaters.		

Issue 7: BAP targets specific to the LEAP area are unknown

This is a new issue that arose through the LEAP Stakeholder Group. Following the production of the UK Biodiversity Action Plan (BAP) in 1994, Local Authorities and environmental organisations, including the Agency, have been compiling county, habitat and species BAPs. The BAP for Norfolk was published in October 1998; it was produced through partnership between English Nature, RSPB, Norfolk Wildlife Trust and Norfolk County Council. Actions and targets for 29 priority species (including otters and water voles) and 10 habitats have been produced to date, with organisations responsible for implementing actions identified. Plan leaders for the species or habitat plans will be identified through the above group; they will be responsible for costing actions and obtaining additional resources where required. The further development of targets and actions specific to the LEAP area would encourage participation at a more local level and facilitate targeting of actions and resources.

The Wash BAP will incorporate actions and targets from both the Norfolk and Lincolnshire county BAPs. It is currently out to consultation and will be published during the year 2000.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Consult with BAP partners and plan leaders to develop targets	Fulfil national and regional biodiversity objectives	Cost/resources to the partners listed right	Agency English Nature Norfolk Wildlife Trust Norfolk County Council RSPB	
2. Do nothing	Cost to the Agency	Lack of local involvement		

Issue 8: There is a need to reassess the mowing regime of river banks to minimise disturbance to wildlife

This issue was raised in the CMP as an activity to the issue *Habitat improvements to the Relief Channel*, although it was also raised as an issue by the LEAP Stakeholder Group. Historically the bank-mowing regime on flood banks consisted of two cuts, firstly in June with a second cut in August/September. Concerns were raised that this regime was resulting in the destruction of nests and bird fatalities. A number of different cutting permutations were then tried; the range of problems experienced included:

- difficulty in cutting woody vegetation;
- wind-blown seeds being transported onto neighbouring lands;
- complaints from walkers on public rights of way;
- difficulty getting tractors onto wet ground; and
- concerns about loss of habitat for birds, small mammals and invertebrates.

Consequently, the Agency committed itself to consult with English Nature and RSPB with the aim of identifying the best practical environmental option for bank-mowing. In principle, a protocol has been agreed between the Agency, English Nature, and the RSPB, stating that mowing will commence after 1st July (except in certain specified cases) with a second cut in August/September. This protocol will be reviewed on a regular basis to take account of experience and views of other parties.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. To develop and implement the bank mowing agreement (to be reviewed annually)	A bank mowing policy that balances the needs of the Agency's Flood Defence and FER functions	Cost of meetings (although this is minimal)	Agency English Nature RSPB	
2. To liaise with angling clubs and Local Authorities with regard to the new cutting regime	Allows concerns of anglers and walkers to feed into the review process	Cost to the Agency	Agency Local Authorities Angling clubs	
3. Do nothing	Cost to the Agency	Continued complaints and damage to wildlife		

Issue 9: There is a need to protect habitat outside designated areas

This is a new issue that arose through the LEAP Stakeholder Group. Within Norfolk, many large wetland sites have some form of designation arising from the European and UK legislative process concerning wildlife and habitat conservation. Such statutory designations include SSSIs, SACs/SPAs, Ramsar sites and NNRs. However, there is concern over the loss of small undesignated and non-statutory designated wetland sites, such as County Wildlife Sites (CWSs). These sites, including wet meadows, wet woodlands and ponds, provide a network of corridors and refuges for wildlife and some are being lost to development and agriculture. The concern is

that not enough is known about these sites, and their lack of designation means that they are not being considered in the planning process (in which the Agency is a statutory consultee). The impact of the loss of these small sites is a cumulative one and needs addressing.

The Agency may not be able to resource this issue.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Carry out a survey to investigate the loss of wetland habitat over the last 50-100 years and identify the distribution of remaining habitat	Improved information will facilitate Agency input into planning initiatives	Cost and resources to the Agency/ Wildlife trusts/English Nature	Agency Wildlife Trusts English Nature	
2. Carry out species surveys at important sites e.g. County Wildlife Sites	This information would provide a baseline with which to monitor impacts	Cost and resources to the Agency/Wildlife Trusts/English Nature	Agency Wildlife Trusts English Nature	
3. Do nothing	Cost to the Agency	Continued loss of wetland habitat		

Issue 10: There is concern over the impact of river structures on sea trout populations in the rivers Nar and Babingley

This issue was identified in the CMP as two separate issues, *Sea trout access to the River Nar* and *Sea trout access to the River Babingley*. The rivers Nar and Babingley are both chalk streams with healthy populations of resident wild brown trout. There is a great deal of anecdotal evidence that both rivers have, in the past, supported significant runs of sea trout. This is not surprising, as both rivers posses the necessary high water quality and an abundance of spawning substrate to support such a population. However, this population is undoubtedly limited by river spanning control structures that allow only small windows for migration to the upstream gravel beds suitable for spawning.

In 1998, the Agency commissioned a study to assess the feasibility of improving the sea trout access to the River Nar. The study looked at the tidal flaps at the confluence of the Nar with the Tidal River. It confirmed that they allow only a very limited window for sea trout to pass. Once beyond the confluence the next obstruction is King's Lynn sluice. At this site, migrating fish could face a jump of 1.5 m; therefore, when the sluice was rebuilt in 1989, provision for a fish pass was incorporated. A fish pass has subsequently been installed. Beyond this the next obstruction is Narborough Mill; however, suitable spawning habitat may exist downstream of it.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Identify areas of suitable spawning substrate using the HABSCORE software	Ability to predict carrying capacity of the habitat	Cost to the Agency	Agency	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Identify structures restricting access to spawning areas	Ability to target resources at a later date	Cost to the Agency	Agency Landowners Angling clubs Salmon and Trout Association English Nature	
3. Identify and cost options to improve sea trout access by modifying existing structures, building fish passes and by-pass channels	Enhanced sea trout run Benefits to local economy due to the high economic value of the fish Enhancing biodiversity. Fulfil legal duties under Salmon and Freshwater Fisheries Act 1975	Cost to the Agency	Agency Landowners Angling clubs Salmon and Trout Association English Nature	
4. Do nothing	Cost to the Agency	Likely further decline of sea trout population		

Issue 11: There are problems with fish being pumped out of the Middle Level System during times of high flows

This is a new issue that arose through the LEAP Stakeholder Group. The Middle Level System (MLS) fulfils the dual role of providing water for irrigation whilst also being a network of watercourses that drain large areas of land, preventing them from flooding. This network also supports a substantial fishery and is an important recreation facility for anglers. Using the sluice at St. Germans (which discharges into the Tidal River), water levels in the MLS are controlled by the Middle Level Commissioners (MLC). During periods of heavy rainfall, the need to discharge large quantities of water can result in high flows in the Middle Level Main Drain. This watercourse is very straight and lacks any features that would allow fish to shelter from high flows, with the result that they can be pumped out of the system. In a similar manner to the Relief Channel (see Norfolk Environmental Overview Supplement), there are options for managing the flows and creating refuge areas.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Discuss with MLC options for reducing peak flow rates	Reduce loss of fish Fulfils Fisheries duties	Cost to the Agency/ MLC Reduction in speed with which water can be discharged from the system	Agency MLC Angling clubs	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Investigate the feasibility of creating fish refuges in the MLS	Reduce loss of fish Fulfils Fisheries duties	Cost to the Agency/ MLC	Agency MLC Angling clubs	
3. Do nothing	Cost to the Agency	Continued loss of fish and reduction in amenity value		

Issue 12: There is an absence of grayling in the River Nar

This is a new issue that arose through the LEAP Stakeholder Group. The River Nar upstream of Marham Sluice is a chalk stream, relatively similar in character to the classic Berkshire and Hampshire streams, the Kennet, Test and Itchen. A common feature of these other chalk streams is that they support an abundant population of grayling, a species absent from the River Nar. The grayling is a species that thrives in clean, fast-flowing, well-oxygenated water with abundant gravel riffles for spawning. This habitat is plentiful in the River Nar yet the species has never been recorded in the Agency's fish population surveys. Our stocking policy does not allow for the introduction of species into rivers in which they are not historically present; however, further research is required to establish whether grayling was previously present and, if so, why it disappeared.

The Agency may not be able to resource this issue.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Examine historical literature, speak to angling club and local residents to establish historical presence or absence of grayling	Improved knowledge of the river	Cost to the Agency	Agency Angling clubs Salmon and Trout Association	
2. If historically present, investigate reason for disappearance	Enhancing biodiversity Improved knowledge of the river	Cost to the Agency	Agency Angling clubs Salmon and Trout Association	 
3. If limiting factor can be removed, undertake grayling restocking	Enhancing biodiversity Fulfil Fisheries duties	Cost to the Agency	Agency Angling clubs Salmon and Trout Association	 
4. Do nothing	Cost to the Agency	Not utilising the full potential of the river to increase biodiversity		

ENJOYMENT OF THE WATERWAYS

Water forms an important part of our landscape. The Agency's recreational responsibilities extend to all inland and coastal waters and associated land. Recreation covers all aspects of water-related leisure activities, from walking and picnicking to formal watersports such as canoeing, rowing, sailing, fishing and waterskiing. The Agency's navigations are valuable resources in environmental, recreational, commercial, heritage and social terms. They also form an important part of the entire inland waterways network and coastal chain of harbours and estuaries.

Issue 13: There is a need to improve recreational and navigation access to Agency-owned land on the Relief Channel and the Cut Off Channel

This issue was partly covered in the CMP by the issue *Recreational access to the Relief Channel*. The Agency has a statutory duty to promote recreational activities on and around water-based sites, especially where we are the landowner; we own a significant amount of riparian land within the LEAP area. With the exception of angling, the Relief Channel and the Cut Off Channel are both relatively under-exploited assets in terms of recreation, although the Relief Channel has also been developed to provide sailing and water skiing facilities. Opportunities exist to explore further possible uses for these watercourses and their flood banks for recreation and navigation.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Open navigation on the Relief Channel by construction of a lock at Denver and new boating facilities along the channel	An extra 17km of navigable waterway It would provides a safe and sustainable route between Denver and King's Lynn that is not currently available Enhanced leisure and tourism opportunities along the Relief Channel	Cost/resources to the Agency User conflicts	Agency Great Ouse Boating Authority (GOBA) Local Authorities Angling clubs Sailing/water skiing clubs	
2. Continue Agency participation in the Fen Access Project and Fen Waterways Regeneration Project, which seeks to utilise the Relief Channel and Cut off Channel to provide facilities for horse-riding, cycling, walking and boating	Fulfils Agency Recreation duties Improved network of trails Enhanced use of Agency assets	Liability for injuries which occur on Agency-owned land Possible impacts on river maintenance Cost to the Agency	Agency Norfolk County Council Local Authorities User groups	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
3. Continue to work with angling clubs to improve angling facilities along both channels	Less damage to flood banks Extended lengths of accessible fishery	Cost to the Agency	Agency Angling clubs	
4. Do nothing	Cost to the Agency	No improvement in recreational access to Agency-owned land		

MANAGING WASTE

The Government's recent Draft National Waste Strategy *A way with waste* (June 1999) has provided a timely and positive steer to the direction for future waste policy. The Strategy recognises the radical changes that will need to be made to our waste management arrangements and general attitudes towards waste and waste management in order to meet the challenges of sustainable development and comply with the Landfill Directive.

The draft makes clear the need for energy from waste plants (incineration) to play a role in integrated local and regional solutions in order to achieve targets. It also emphasises a continued commitment to using economic instruments to influence the waste management option chosen. Using instruments such as the Landfill Tax to discourage waste generation and disposal via landfilling, as well as the introduction of further Producer Responsibility Regulations like those in place for packaging to cover vehicles, batteries, electrical equipment, indicates the Government's desire to encourage waste minimisation, recovery and recycling by increasing the disposal costs for those wastes unavoidably produced.

The strategy also contains some very tough targets for wastes reduction and recovery for household, commercial and industrial wastes that reflect the need to recover more value from the wastes we produce. With the need for more composting and energy from waste facilities for the recovery of municipal-type wastes there may be more pressure on the planning system in the near future as these types of development proposal (which have long lead-in times) begin to be looked at. The need to intervene to stabilise markets for recycled materials is also recognised and market development bodies are to be set up to address the need to stimulate demand.

One of the main themes of the strategy is the need to change our attitudes towards the generation and management of waste, through a thorough programme of raising awareness and education.

Issue 14: There is concern over environmental impacts of Blackborough End waste management sites

This is a new issue that arose through the internal LEAP Project Team. Blackborough End comprises five active licensed waste management sites, including landfill sites, a household recycling site, and a transfer station. There are a number of ongoing licensing and enforcement issues associated with operational and engineering activities at the site. In addition, the Agency is aware of public concern over the perceived and potential environmental impacts of the site.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Work towards an improved liaison with the site operators	Ensures issues are identified and resolved with agreement from all parties		Agency Site operators	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Continue involvement in the local liaison group	Will identify and resolve local waste management issues, improve local liaison and alleviate local concern	Cost/resources to the Agency	Agency Site operators Parish Council Breckland District Council KL&WN BC Quarry operators	
3. Do nothing	Cost/resources to the Agency	Continued concern over environmental impacts		

RISKS TO WATER QUALITY

Water is a fundamental requirement for all forms of life. It is a vital component of our environment and essential to society. The management of water quality for sustained use can only be achieved by effective policies to influence and regulate those activities that impact upon it.

The water environment includes rivers, lakes and canals, groundwater, estuaries and coastal waters. Society makes use of the water environment in many varied ways, including water abstraction for drinking water, agricultural and industrial use, disposal of treated effluent, development of fisheries and a wide range of recreational uses. Our role is to resolve these conflicting uses and ensure that water is of suitable quality to support them and to maintain diverse aquatic ecosystems. We will protect, manage and, where possible, enhance the quality of all these controlled waters and thereby contribute to sustainable development.

Issue 15: A number of river stretches fail to meet their River Ecosystem targets

This issue arose through the internal LEAP Project Team, although River Ecosystem (RE) failures in the Middle Level Main Drain and River Nar were also issues in the CMP. The failures in the LEAP area are due to low dissolved oxygen concentrations or high biochemical oxygen demand caused by low flow conditions, excessive plant growth and algal blooms. The rivers that have failed their water quality targets are; Middle Level Main Drain; Smeeth Lode; Mill Basin; and the River Nar (at: a road bridge near Grenstein Farm to Litcham; Lexham Hall to Newton Public House and Castle Acre to the road bridge, Bradmoor Plantation).

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Continue routine monitoring	Identify and prioritise improvements that may be required in the future	Cost to the Agency	Agency	
2. Target pollution prevention visits of farms	Identify illegal activities and pollution prevention measures	Cost to the Agency	Agency	
3. Do nothing	Cost to the Agency	Not an option for monitoring		

Issue 16: There is concern over eutrophication of the Great Ouse estuary

This issue is being addressed through the Wash LEAP that has recently had its First Annual Review published. It has been included here for reference only, and the table below reflects the current situation:

Wash LEAP Issue 12: There is concern over possible eutrophication of the Wash			
ACTION	**ACTION PERIOD**	**PROGRESS TO DATE:**	**Lead partners / other organisations**
1. Investigate the nature and extent of any manifestations of eutrophication in the Wash	1998/99 to 2002/3 and beyond	Evidence is currently being gathered to put forward the Wash as a candidate Sensitive Area Eutrophic under the Urban Waste Water Treatment Directive at the next review in 2001	Agency
2. Identify the source of nutrients	1998/99 – 1999/2000	Nutrient monitoring has been established in conjunction with the above	Agency
3. Direct water quality initiatives towards alleviating problems identified	2000/01 – 2002/03 and beyond		Agency

Issue 17: Groundwater is vulnerable to pollution

This issue is an amalgamation of two CMP issues, *Groundwater source protection* and *Rising nitrate levels in groundwater*. Groundwater in the area is generally of high quality but is vulnerable to pollution and the threat to groundwater quality is a major issue. There are increasing levels of nitrates in some areas and to tackle this problem Nitrate Vulnerable Zones (NVZs) have been established by MAFF. There are two NVZs in the LEAP area – Swaffham and Great Bircham. The Agency has groundwater Source Protection Zones (SPZs) around major supply boreholes to aid the implementation of the Groundwater Protection policy.

PROPOSALS	**ADVANTAGES**	**DISADVANTAGES**	**Lead partners / other organisations**	**THEMES**
1. Define groundwater SPZs for any new sources	Improve pollution protection for groundwater	Cost to the Agency	Agency	
2. Target pollution prevention inspections within groundwater SPZs	Identify potential sources of pollution and encourage appropriate pollution prevention measures	Cost to the Agency	Agency	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
3. Enforce NVZ Action Programme Rules and encourage Good Agricultural Practice	Achieve a long-term reduction in pollution risks to aquifers	Cost to the Agency	Agency	
4. Do nothing	Cost to the Agency	Land will not be used in a sustainable manner and will pose a long-term threat to the environment Contamination may spread more widely through the aquifers		

Issue 18: Hunstanton Main and Heacham North beaches fail to meet guideline bathing water quality standards

This issue is being addressed through the Wash LEAP that has recently had its First Annual Review published. It has been included here for reference only, and the table below reflects the current situation:

Wash LEAP Issue 9: Failure against standards of the EC Bathing Waters Directive is threatened at Heacham by polluting discharges to tributaries of the Wash in the locality

ACTION	ACTION PERIOD	PROGRESS TO DATE	Lead partners / other organisations
1. Carry out coastal and freshwater surveys to investigate the sources of contamination (including Heacham River freshwater inputs to coastal waters) and produce recommendations	1998-99	Recent surveys have shown that the source of the elevated levels of coliforms has been confirmed as diffuse releases from the marina gravels where insecure foul drains and septic tanks that serve smaller caravan parks and private holiday homes are located. Heacham Parish Council has been successful in reducing and stabilising the wildfowl population, which is another potential contributor. Works have also been carried out at Hunstanton STW (storm sewage retention) and Heacham STW (ultraviolet treatment)	Agency AWS KL&WN BC
2. Implement the recommendations of surveys detailed above	1999/2000 – 2002/03 and beyond		Agency
3. Regularly monitor the microbiological quality of non-designated bathing waters	1998/99 – 2002/03 and beyond	Ongoing	Local Authorities Agency

Issue 19: There has been a failure to meet environmental quality standards (EQS) for tributyl tin in the Great Ouse estuary

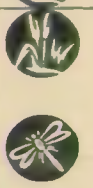
This is a new issue that arose through the internal LEAP Project Team. Routine monitoring carried out in the estuary has highlighted a failure of the organo-tin pesticide EQS for tributyl tin (TBT). Historically, TBT paints were widely used as anti-foulants for ships, boats and nets; however, the detection of widespread deleterious effects on shellfish populations resulted in a ban on their use on vessels less than 25 m in length in 1987. Possible causes of the failure include: illegal use of TBT paints on small craft; input from continued use of TBT paints on large vessels; leaching from re-suspended sediments as a result of historic use; and inputs from riverine and sewage sources.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Continue monitoring	Identify failures, possible sources and any further deterioration	Cost to the Agency	Agency	
2. Do nothing	Cost	Sources and deterioration will not be identified		

Issue 20: There is concern over the impact of poor water quality on the River Nar SSSI

This issue encompasses four CMP issues relating to River Nar water quality problems. The maintenance of water quality in the River Nar is of vital importance for sustaining the conservation value of the river, as well as other key uses such as fisheries and the abstraction of water for public supply. The main issues that need to be addressed are i) organic enrichment from STWs and ii) siltation and pesticide pollution from agricultural run-off. The River Nar stretches: road bridge near Grenstein Farm to Litcham; Lexham Hall to Newton Public House; and Castle Acre to the road bridge, Bradmoor Plantation, fail their RE targets for DO for the three year compliance period ending December 1998. Low flows have been a problem in the River Nar and may contribute to the DO failures (see also Issue 15).

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Review all data	Possibility of setting specific River Classifications targets for GQA and nutrient concentrations	Cost to the Agency	Agency	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Continue reviews of compliance of water quality with targets	Determine cause of failures and implement necessary improvement	Cost to the Agency	Agency	
3. Assess ecological impacts of nutrient inputs and low oxygen levels, taking into account recent changes in nutrient inputs	Increased knowledge of effect of organic pollution and nutrient input	Cost to the Agency	Agency	
4. Review point source discharge	Minimise pollutant input where appropriate	Cost to the Agency	Agency	
5. Investigate, review and, where appropriate, implement methods such as Countryside Stewardship to encourage sympathetic management of the river catchment and corridor	Potential reduction of phosphorus and silt input from agriculture	Cost to the Agency	Agency	
6. Review levels and possible impact of persistent chemicals	Allow an assessment of the risk and if necessary to propose a monitoring programme	Cost to the Agency	Agency	
7. Investigate further the use of chlorophyll *a* and diatom data as a biological index	Will provide a link between biological and chemical water quality status	Cost to the Agency	Agency	
8. Do nothing	Cost to the Agency	Poor water quality may affect the SSSI status of the River Nar		

NEEDS FOR MONITORING AND FURTHER INVESTIGATION

When a LEAP is prepared, we are tasked with assessing the state of the local environment. To do this we use certain indicators of health of the environment e.g. how much nitrogen dioxide is in the air, the quantity and variety of fish species in a given river etc. In some instances we do not know enough about the local environment to assess its state.

Issue 21: There is concern over the air quality in North Lynn

This is a new issue that arose through the internal LEAP Project Team. There has been concern among residents of North Lynn for a number of years that the emissions from local chemical plants (several of which operate IPC processes that are licensed by the Agency) are causing ill health within the community and especially among the children of St. Edmunds Primary School. There was a meeting in 1996 involving King's Lynn and West Norfolk Borough Council, the Agency, the Local Education Authority and representatives of the local community. The perceived problem was discussed at length and it was agreed that if evidence could be found of a higher incidence of ill health then the Borough Council and the Agency would investigate further. At present, there are four premises in the North Lynn area under IPC, all of which are inspected regularly and are compliant with their authorisations.

A further local meeting was held during August 1999, involving, amongst others, the Borough Council, the Health and Safety Executive (HSE), the Agency, Norfolk Health Authority, the Clean Rivers Trust, the North Lynn Action Group and local residents. At this meeting it was agreed that the best approach to addressing the residents' concerns over their environment was to form a group consisting of a residents' representative, the Borough Council and other bodies, including the Agency.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Establish an action-based group	Will involve statutory agencies, industry and the local people of North Lynn Latest information will be disseminated to the local people	Staff time required from all bodies listed right	Agency KL&WN BC HSE Education Authority Norfolk Health Authority Industry Local community	
2. Carry out further epidemiological studies using existing health data	Will establish the existing situation	Little data readily available Time needed to analyse results	Norfolk Health Authority Local community	
3. In conjunction with the local community, carry out new research into the fate of substances released into the environment	Will help to establish levels of substances in the environment	Interpretation of results Cost to all bodies listed right	Agency KL&WN BC Industry Local community	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
4. Examine environmental, social and economic conditions of the local area	May help to establish any link(s) between environmental factors of the local area and ill health	Research may not be able to indicate specific factors relating to ill health Time and cost to bodies listed right	Agency KL&WN BC HSE Education Authority Norfolk Health Authority Industry Local community	
5. Do nothing	Cost	Concerns of local community would not be addressed adequately Possible loss of credibility for the Agency as an effective and responsible environmental regulator		

IMPROVING FLOOD DEFENCES

Controlled flooding is a process that is usually beneficial to the natural environment. Flood defence is about intervention in natural processes because of human activity and development in the floodplain. Flood defence seeks to reduce the risk from flooding in order to safeguard lives, sustain economic activity and protect and enhance the environment in England and Wales.

Issue 22: Sea defences at Sea Banks East (Wolferton to Snettisham) need re-shoring and re-profiling

This issue was in the CMP as *Sea Banks East, Wolferton-Snettisham*. Sea defences at Sea Banks East, from Wolferton to Snettisham need re-profiling at specified locations because it is necessary to re-shore the defences. However, the traditional method – using material from seawards borrow pits – is no longer acceptable because of the environmental impacts on the salt marsh. A new source of material for re-shoring the defences needs to be found. The high cost of importing suitable material and the low benefits attributable to the property protected reduces the priority that can be given to this project.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Preliminary feasibility studies to be carried out on re-profiling sea defences	Will strengthen the flood defences	Cost to the Agency	Agency English Nature RSPB Landowners	
2. Do nothing	Cost to the Agency	No improvement in flood defences		

Issue 23: There is concern that tidal defences between Hunstanton and Snettisham provide inadequate protection from flooding

This issue was in the CMP as *Coastal Zone Development*. Caravan parks located between the soft (primary) and hard (secondary) defences between Hunstanton and Snettisham are vulnerable to tidal flooding; flood defences along this stretch of coastline need to be improved. The Agency is in discussions with MAFF regarding a strategy for improving the defences; in the meantime, the Agency is working with King's Lynn and West Norfolk Borough Council in reviewing flood warning and evacuation procedures at the vulnerable sites.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Improve the standard of flood defence to protect caravan parks	Reduce the risk of tidal flooding and damage to holiday homes and caravans	Cost to the bodies listed right	Agency MAFF KL&WN BC	

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
2. Review flood warning and evacuation procedures	Improved flood warnings to population	Cost/resources to the Agency and KL&WN BC	Agency KL&WN BC	
3. Do nothing	Cost	Increase the possibility of flooding and no improvement in flood warning services	Agency MAFF KL&WN BC	

Issue 24: There is the potential for King's Lynn (South Quay) tidal defences to be compromised

This issue was in the CMP as *King's Lynn Sea Defences – South Quay*. Development over many years in the South Quay area of King's Lynn has resulted in uncertainty over the integrity of surface water drainage systems which outfall into the Tidal River. Reports from property owners of high groundwater levels in cellars during periods of high tides suggest that water may be 'backing up' old surface water systems which are redundant. Further investigation is required to establish/confirm the extent of the problem.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Update records and procedures as whereabouts of pipework becomes known	Better data for decision making	Unknown size of problem	Agency Utility companies Landowners	
2. Investigate the possibility of installing a new tide gauge closer to the Great Ouse estuary	Would give a more accurate indication of tidal levels in King's Lynn town itself (Freebridge gauge is upstream of King's Lynn)	Cost to the Agency	Agency Associated British Ports	
3. Continue to issue "conservative" flood warnings	Ensure best possible preparation against flood risk	Not a total solution to the problem	Agency Police KL&WN BC	
4. Do nothing	Cost/resources	Increased possibility of flooding in properties No improvement in flood warning service		

Issue 25: There is concern over the impact of siltation on flood defences and navigation in the Tidal River

This issue has been developed from a combination of two CMP issues, *Tidal River siltation* and *Tidal River training walls*. Following the completion of the flood protection scheme, the Tidal River between Denver and King's Lynn has suffered increased siltation during the last 35 years

and this is now affecting water movement and sluice operation. The training walls, which run on both sides of the Tidal River from King's Lynn to the Wash, are meant to provide a "self-cleansing" channel in terms of sediment for Navigation and Flood Defence purposes. Salt marsh has encroached on these walls, reducing their effectiveness. The Tidal River Siltation Strategy report (part of the wider Wash Rivers Outfall Siltation Strategy) was published during 1999 and improvements to the training walls are due during the financial year 1999-2000.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Review efficiency of Tidal River	Identifies issues and options for future	Cost to the Agency	Agency	
2. Build further training walls	Possible long term cleansing of channel	Cost to the Agency	Agency	
3. Dredge silt from channel	Immediate solution to the problem	Short-term solution only Cost to the Agency	Agency	
4. Increase height of training walls	Reduce volume of silt entering the Tidal River	Medium-term solution only Cost to the Agency	Agency	
5. Review operation of Denver Complex for de-silting channels	Reduction in silt levels in the Tidal River	Cost to the Agency Loss of operational accuracy during low flows Possible problems with discharge of water from the Ouse Washes	Agency	
6. Do nothing	Cost	Water movement in the channel will be further reduced Sluice operation will be further impeded Navigation will be restricted further		

Issue 26: Water Level Management Plans need to be completed

This issue was in the CMP as *Water Level Management Plans*. Water Level Management Plans (WLMPs) were introduced by MAFF in 1994. These plans provide the means by which current water level management practice is recorded and a means by which water level requirements for a particular site can be discussed and the range of activities such as agriculture, flood defence and nature conservation can be balanced and integrated. All WLMPs for SSSIs need to be completed by March 2000. The Agency is charged with completing the River Nar SSSI WLMP (medium priority) and Boughton Fen SSSI WLMP; publication of the Nar Conservation Strategy (see Chapter 1.2.1 of the Norfolk Environmental Overview Supplement) has fulfilled this duty for the River Nar. Reviews of the plans will then follow.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Assist in production of Water Level Management Plans	Improvement in water level management leading to improved species and habitat diversity	Increased control of structures required Cost to the Agency	Agency IDBs MAFF English Nature Landowners	
2. Prioritise and implement actions identified in the WLMP	Improvement in water level management leading to improved species and habitat diversity	Cost to the Agency	Agency IDBs MAFF English Nature Landowners	
3. Do nothing	Cost/resources to the Agency	No improvement in water level management in SSSIs Government target will be missed		

Issue 27: The future of Snettisham Beach groynes needs to be evaluated

This is a new issue raised through the internal LEAP Project Group. The groynes have become worn through age and damaged by recycling operations and there are possible safety risks associated with them. Consideration is being given to the need for the groynes and, if appropriate, the design of replacement groynes in the future under the Hunstanton-Snettisham Beach Strategy Report. It would be in line with the Wash Estuary Management Plan Objective L5 to keep or replace the groynes (*To conserve the seaside features which relate to the wider Wash landscape*). The most likely option is for annual maintenance of the groynes to be carried out until a longer-term solution is identified.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Consider options when Strategy Report is approved	Long-term solution(s) identified	Cost to the Agency Time taken to implement solution(s)	Agency KL&WN BC	
2. Continue with annual maintenance of groynes	Reduced safety hazards from damaged groynes	Not a permanent solution Cost to the Agency	Agency KL&WN BC	
3. Do nothing	Cost to the Agency	Increase in safety risks from damaged groynes		

Issue 28: There is a need to meet Bye Report Actions for improving flood defences to the specified deadlines

This is a new issue raised through the internal LEAP Project Group. The Bye Report into the 1998 Easter Floods made a large number of recommendations for improving flood defences and warnings. The Agency has been given extra funding to meet the requirements of the Bye Report for improving flood defences; many Agency Flood Defence staff members have been taken off their normal duties to carry out the initial Asset Survey of all flood defence structures, as recommended. Further surveys will be carried out on a six-month frequency, for as long as required. A further recommendation was to identify people in high-risk flood areas. Currently, all Bye Report targets have been met by the specified dates.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Create a Flood Defence Asset Database	Database will provide Agency with the location, condition, asset type, estimated life, urgency of repairs, ownership etc	Cost/resources to the Agency	Agency	
2. Identify people in high risk flood areas so that they can be targeted with flood warning information annually	Better knowledge of people at risk	Cost to the Agency	Agency	
3. Do nothing	Cost to the Agency	Increased risk of flood defence asset deterioration No improvement in flood warning service in high risk areas		

Issue 29: There is an inadequate level of flood defence protection on the River Nar

This issue has combined two issues identified in the CMP: *River Nar bank instability* and *Non-main river flooding at West Winch*. Over the last 10 years there have been five events where the existing banks were overtopped, three of which resulted in breaches causing flooding of adjacent land. The River Nar discharges into the Tidal River via a gravity outfall sluice at King's Lynn. It is during times of high river flows, following heavy rainfall and the inability to discharge into the Tidal River because of tidal levels, that the river Nar system becomes stressed. The Agency has employed the services of consultants to undertake a Feasibility Study for Flood Defence Improvements. The project is nearing completion and recommends the following proposals:

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Construct a new 650 m-long diversion channel to allow discharge under flood flow conditions into the Relief Channel	The flood risk in the lower Nar will be reduced	Cost to the Agency	Agency English Nature Landowners IDBs	
2. Undertake bank-raising along parts of the embankments	The danger of banks being breached will be reduced	Cost to the Agency	Agency Landowners IDBs English Nature	
3. Construction of 9.5 km of permanent haul road adjacent to banks	It will improve access to the banks for maintenance purposes	Cost to the Agency	Agency Landowners IDBs English Nature	
4. Construction of a 60 m-long spillway	This will provide controlled over-topping during extreme events	Cost to the Agency	Agency Landowners IDBs English Nature	
5. Do nothing	Cost to the Agency	No improvement in flood defence standards		

Issue 30: The use of managed realignment as part of the coastal defence strategy in the east of the Wash needs to be evaluated

This is a new issue raised through the LEAP Stakeholder Group. Managed realignment is where the primary defence line is moved landwards, allowing the current defences (if any) to be destroyed over time by the sea and lengthening the distance between the coastline and the new defence line. In lowland coastal areas, salt-marsh usually becomes the new defence structure, the power of the waves being dissipated as they cross the marsh.

Salt-marsh is a national BAP habitat; creating or expanding salt-marsh habitat as the consequence of a managed realignment scheme may help towards reaching the national target for that habitat. Salt-marsh will also be a habitat in the Wash BAP; the actual BAP target will be in line with the Wash SAC management plan. Under the UK BAP, the Agency is the lead contact for coastal salt-marsh. Our responsibilities include to achieve targets, set standards for monitoring and reporting and agree the overall work programme. A draft habitat national action plan for coastal salt-marsh is being prepared and action plans for both salt-marsh and intertidal mud and sand flats are included in the Kent BAP.

In the 1996 *Wash Shoreline Management Plan* (SMP), the LEAP area is covered by three management units; Guy's Head to West Lynn (6), Babingley River Outfall to Wolferton Creek (7) and Wolferton Creek to Snettisham Scalp (8). For units 6 and 8, managed retreat is ruled out as an option for at least the next five years (the working life of this LEAP). In unit 7, managed realignment is considered "technically viable and sustainable", although it "may not be compatible with existing coastal processes, since the foreshore appears to be accreting". Although managed realignment may lead to the removal of protection for residential areas,

agricultural land and recreational facilities (and hence conflict with the objectives of the SMP), it is concluded that this option may become viable in the next five years.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Continue monitoring of shoreline stability	A better understanding of the current coastal processes	Cost to the organisations listed right	Agency MAFF KL&WN BC Landowners	
2. Monitor current and predict future sea-level changes in the Wash from the latest scientific research; utilise results in assessing the future impacts on coastal processes	Allows a better understanding of magnitude of likely future changes Allows future changes to be considered when formulating medium- and long-term coastal defence strategies	Cost to the Agency, DETR and MAFF Different future predictions may give divergent results leading to uncertainty	Agency Meteorological Office Universities DETR MAFF	
3. If future monitoring and/or predictions indicate a retreating shoreline, conduct a feasibility study for implementing a managed realignment scheme	Greater understanding of whether managed realignment is a viable option	Cost to the organisations listed right	Agency MAFF DETR KL&WN BC Landowners English Nature RSPB Wash Estuary Strategy Group IDBs	
4. Implement a managed realignment scheme	More cost-effective flood defences Increased salt-marsh habitat in line with BAP target	Possible loss of residential areas, Grade II agricultural land and recreational facilities Possibility of altering sediment supply down-drift	Agency MAFF DETR KL&WN BC English Nature Landowners RSPB Wash Estuary Strategy Group IDBs	 
5. Do nothing	Cost (short-term) to Agency, MAFF and DETR	Likely to be non-sustainable solution in the medium/long-term		

Issue 31: Proposed development behind River Nar flood defences is of concern because of insufficient flood protection

This issue was identified in the CMP as *Proposed development behind River Nar flood defences.* Land to the south of King's Lynn adjacent to the River Nar has been identified in the King's Lynn and West Norfolk Local Plan (Deposit Draft) for use for both employment and housing. However, the present River Nar embankments afford protection to agricultural land only. Prior

to any development, the flood defences would need to be improved to cater for a 100-year return period flood and be subject to Agency approval.

PROPOSALS	ADVANTAGES	DISADVANTAGES	Lead partners / other organisations	THEMES
1. Improve flood defences to required standard if any development is to take place	Will allow any development to proceed on flood defence grounds	Cost to developers and landowners	Developers Landowners Agency	
2. Do nothing		Development of land for employment and/or housing would not be permitted		

Kalajuga Sluice (Heacham River) lacks a secondary defence

At the initiation of the LEAP process, this was still an outstanding issue. However, a penstock was installed during the summer of 1999 and the issue has therefore been resolved.

3.3 Prioritised issues lists

Since the last workshop with the LEAP Stakeholder Group, a new issue came to light (*Issue 21: There is concern over the air quality in North Lynn*) which has been included in the Draft LEAP. It has not been included in the prioritised list as it was not included in this process.

Table 3.3: Non-Flood Defence issues

Rank	Score	Issue	Issue Number
1	279	Groundwater is vulnerable to pollution	17
2	271	A better understanding of the water requirements of the environment and the impacts of abstraction is needed	3
3	270.7	There is concern over eutrophication of the Great Ouse estuary	16
5	268	There is concern over the impact of poor water quality on the River Nar SSSI	20
6	253	There are problems with fish being pumped out of the Middle Level System during times of high flows	11
7	250	The allocation of the water resources and the licensing policy require restating	4
8	246	There is a need to assess and, where appropriate, protect the ecological status of headwaters	6
9	245	A better understanding of the water balance of the LEAP area is required	2
12	237	Water Level Management Plans need to be completed	26
13	236	There is concern over the impact of engineering works on riverine habitat diversity	5

14	235.8	There has been a failure to meet environmental quality standards (EQS) for tributyl tin in the estuary	**19**
15	235.2	BAP targets specific to the LEAP area are unknown	**7**
16	233	There is concern over environmental impacts of Blackborough End waste management sites	**14**
17	221	The demand for water during the summer can often exceed available resources	**1**
18	218	A number of river stretches fail to meet their River Ecosystem targets	**15**
20	183	There is concern over the impact of river structures on sea trout populations in the rivers Nar and Babingley	**10**
27	153	There is an absence of grayling in the River Nar	**12**
30	134	There is a need to improve recreational and navigation access to Agency-owned land on the Relief Channel and Cut Off Channel	**13**

Table 3.4: Flood Defence issues

Rank	Score	Issue	Issue Number
4	270.2	There is concern over the impact of siltation on flood defences and navigation in the Tidal River	**25**
11	239	The use of managed realignment as part of the coastal defence strategy in the east of the Wash needs to be evaluated	**30**
21	178	Sea defences at Sea Banks East, Wolferton - Snettisham need re-shoring and re-profiling	**22**
22	172	There is a need to reassess the mowing regime of river banks to minimise disturbance to wildlife	**8**
23	171	There is a need to protect habitat outside designated areas	**9**
24	167	Water movement behind the tidal defences at South Quay (King's Lynn) is insufficiently understood	**24**
25	161	There is concern that tidal defences between Hunstanton and Snettisham provide inadequate protection against flooding	**23**
26	158	There is a need to meet Bye Report Actions for improving flood defences to the specified deadlines	**28**
28	147	Flooding on the lower Nar needs to be addressed	**24**
29	136	The future of Snettisham Beach groynes needs to be evaluated	**27**
31	119	Proposed development behind River Nar flood defences is of concern because of insufficient flood protection	**31**

These prioritised lists are shown as a direct result of the wishes of the stakeholder group to list the results of the process. The Agency and the Area Environment Group have *not* endorsed this approach; the relatively low ranking of some of the Flood Defence issues has been a source of concern to some members of the AEG sub-group (Chapter 3.1 discusses possible reasons for this). We would welcome your comments on this approach to ranking of issues.

CHAPTER FOUR – A BETTER ENVIRONMENT THROUGH PARTNERSHIP

This section aims to provide the opportunity to address longer-term management issues in partnership with others.

4.0 Introduction

The aim of this section is to highlight broader long-term issues and profile the types of partnership required to tackle them. Establishing close and responsive relationships with all sectors of the community is vital if we are to achieve integrated environmental management and a better environment for present and future generations.

We are well placed to influence many of the activities affecting the environment, through the Environment Act 1995 and other associated legislation. For example, we are the lead regulator for the water environment and have regulatory powers over waste management activities. In addition, we share with Local Authorities the regulation of emissions to the air. However, we have little direct control over land use, which is primarily the responsibility of Local Authorities. We will prepare and monitor LEAPs to demonstrate and reinforce our commitment to integrated environmental management and the partnership approach.

Why Partnership?

Partnership is a much-abused term, but it essentially means a number of different interests willingly coming together, formally or informally, to achieve some common purposes in the spirit of trust and commitment. Partnerships are desirable because they provide accountability, reduce duplication between agencies and can pool funding, resources and expertise for projects; however, they take time to develop.

In this chapter we examine the major opportunities to address environmental issues through partnerships with others. It also highlights broader, long-term issues and outlines partnerships required to address them. We are currently involved in many projects and activities that rely on partnerships. Close links are already established with Local Authorities, water companies, industry, farmers, landowners, conservation bodies, angling clubs and recreation groups. Partnerships with these organisations will be strengthened and we will seek new links with other bodies. We hope that this Draft LEAP will help us to achieve even more by working closely with others to address issues in the North West Norfolk LEAP area and secure a stronger basis for environmental protection and enhancement.

The chapter is divided into three main parts:

- Strategic Environmental Issues;
- Local Agenda 21 (LA21) and Biodiversity Action Plans; and
- Education and Awareness.

We have made every effort throughout to apply these concepts to the local communities of the North West Norfolk LEAP area.

4.1 Strategic Environmental Issues

By long-term we mean well beyond the five-year horizon of this Plan and over the next 20-25 years. We have published *An Environmental Strategy for the Millennium and Beyond* (September 1997) which highlights the following nine main themes for our work (and a number of key activities necessary to address them).

We have attempted to illustrate below how working with others can contribute to achieving these aims, giving, where possible, activities focusing on the North West Norfolk LEAP itself.

Theme 1: Addressing Climate Change

The UK, like all nations, emits into the atmosphere greenhouse gases that are widely thought to be causing climatic changes. As a signatory to the agreements made at the Framework Convention on Climate Change, held in Rio de Janeiro in 1992, and the Kyoto and Buenos Aires Summits in 1998, the UK is playing an active part in ensuring that effective reductions in greenhouse gas emissions are achieved.

Most computer models of the climate system suggest that, in the future, winters are likely to become wetter and summers drier. A report of the UK Climate Impacts Programme, published in September 1998, predicts increased rainfall throughout the UK annually, although the North-West is expected to see a greater increase than the South-East. Greater variability of rainfall, with increased storminess and more droughts, is also predicted.

The consequences of climatic change could have far-reaching implications for the Agency's responsibilities. The possibility of increased rainfall and temperatures, resulting in more frequent flooding and sea level rise, could add pressures on Flood Defence, whereas changes in rainfall distribution are likely to affect Water Resources and Water Quality.

Key issue towards 'Addressing Climate Change': We need to ensure that we incorporate any anticipated changes in climate into our assessments of flood risk, the design of flood defences and the options for water resources management.

Burning fossil fuels in cars, power stations and in industrial processes emits greenhouse gases (such as carbon dioxide) into the atmosphere. Greenhouse gases are believed to contribute to long-term climatic changes. Locally, our main influence on climate change will be to help ensure that the Government's greenhouse gas reduction targets are met by regulating emissions from major industrial processes. We are also setting an example by reducing our own energy and fossil fuel consumption.

It is Agency policy that landfill gas should be combusted wherever possible. Landfill gas from the Norfolk Environmental Waste Services site at Blackborough End is extracted and burned to produce 750 kW of electricity per hour. The power generated is sold to the National Grid at a guaranteed price under the Non-Fossil Fuel Obligation in yearly tranches. As well as generating electricity, the carbon dioxide which is produced by burning the landfill gas has, gram for gram, 21 times less Greenhouse Warming Potential than the original methane (the dominant combustible component of landfill gas), thus reducing the net greenhouse gas effect.

Theme 2: Regulating Major Industries

One of our key responsibilities is to prevent the unauthorised release of pollutants into the air, water or land through Integrated Pollution Control (IPC). The IPC system requires that prescribed processes should use the principle of Best Available Techniques Not Entailing Excessive Cost (BATNEEC) to prevent or minimise polluting substance releases and render all released substances harmless. Regulators and operators should also have regard to the best practicable environmental option (BPEO) for the releases. The principles of BATNEEC and BPEO ensure that the needs of industrial processes are appropriately balanced with the costs and benefits of environmental protection.

The Agency and Business in the Environment developed the 3Es (Emissions, Efficiency, Economics) methodology as a structured technique to achieve improved environmental performance through process optimisation. The Agency has also developed the Operator and Pollution Risk Appraisal (OPRA) system to provide an objective and consistent assessment of the risk from IPC processes.

One of the basic principles of IPC is continuous improvement. The operator of a Part A prescribed process requires an IPC authorisation, which is subject to statutory review every 4 years. The IPC authorisation includes:

- Release limits;
- Reporting requirements;
- Operating conditions; and
- Improvement programmes.

In the *Strategy for the Millennium and Beyond,* we have a commitment to address climate change and improve air quality. This includes reduction targets for carbon dioxide, sulphur dioxide, oxides of nitrogen, fine particulates (PM_{10}), carbon monoxide, dioxins, lead, non-ferrous metals, volatile organic compounds (excluding methane), ozone-depleting substances and other greenhouse gases. These emission reduction targets relate only to processes under our control and are subject to BATNEEC and BPEO.

Emissions data are collected by the Agency and published through the Pollution Inventory. The routine monitoring carried out by the Agency supports and checks the monitoring that the operators carry out as a requirement of their authorisations.

Integrated Pollution Prevention and Control (IPPC)

The Integrated Pollution Prevention & Control (IPPC) EC Directive 96/61/EC has been implemented into UK law by the provisions of the Pollution Prevention and Control Act 1999 and should be fully implemented by the end of 1999. The introduction of the supporting regulations will set out a Europe-wide policy to improve the standard of environmental protection. IPCC is similar to the IPC regime operated by the Agency since 1991, although IPPC regulates more industrial sectors and takes into account more environmental concerns than IPC, including energy conservation and the clean-up of sites when activities cease.

In accordance with sustainable development, it consists of preventing, reducing and eliminating pollution. It will do this by giving priority to pollution prevention at source and ensuring prudent management of natural resources, in compliance with the "polluter pays" principle. The Directive covers emissions to all media (air, land and water), as well as heat, noise and vibration, energy efficiency, environmental accidents and site clean-up.

The Directive refers to integrated control and prevention of pollution from "installations", where one or more of the following categories of activities, subject to certain capacity thresholds, are carried out:

- *Energy industries* – e.g. power stations, oil and gas refineries;
- *Production and processing of metals* – ferrous and non-ferrous;
- *Mineral industry* – e.g. cement works, glass works;
- *Chemical industry* – organic, inorganic, pharmaceuticals;

- *Waste management* – e.g. landfill sites, any installation disposing of hazardous waste, some installations recovering hazardous waste, IPC authorisations for sewage sludge incinerators; and
- *Other activities* – e.g. timber pulp production, slaughterhouses, food/milk processing, intensive pig/poultry units, organic solvent users and carbon production.

We welcome IPPC as a more holistic approach to environmental management and regulation and will continue working in partnership with industry to achieve the aims of IPCC.

Key issue towards 'Regulating Major Industries': Protection and enhancement of the environment as a whole by preventing or minimising pollution from the most technically complex and potentially most polluting industrial processes in England and Wales.

Theme 3: Improving Air Quality

We are committed to helping Local Authorities implement the National Air Quality Strategy (NAQS) through partnership, liaison and exchange of air quality data and information. The main sources of air pollutants in this area are transport, agriculture and industry. Control of air pollution from transport is the responsibility of Local Authorities and not the Agency, although we are reducing emissions from our own vehicles by reducing mileage and encouraging the use of public transport. We are also encouraging the public to consider the impact their travel has on the environment. In this LEAP area we are in discussions with King's Lynn and West Norfolk Borough Council with respect to the NAQS.

Key issue towards 'Improving Air Quality': The need for the Agency and others to be involved in Local Authority air quality management forums so that data and expertise can be pooled to help address the issues.

It is anticipated that the Government's recently published White Paper *A new deal for transport - better for everyone* (1998) will lead to greater consideration of the environmental impact of transport on air quality at the planning stage. We would anticipate Agency participation wherever environmentally sensitive areas or sites are involved and a balance between transport and the environment has to be achieved.

The Integrated Pollution Prevention and Control Directive implemented in October 1999 covers emissions to all media (air, land and water) and is discussed in more detail in Theme 2: Regulating Major Industries.

Theme 4: Managing Waste

The adoption of the Landfill Directive in April 1999 means that we must achieve the progressive diversion of biodegradable municipal waste away from landfill. There should be a diversion from landfill of 25%, 50% and 65% of the waste produced in 1995 (as a baseline year) within 5, 8 and 15 years respectively of the implementation date.

Compliance with the Directive will see a major shift in the way we approach the management of waste in the UK. There will need to be a reducing use of landfill in favour of recycling materials at recovery facilities, composting at home and at Local Authority sites, as well as the more extensive use of incineration with energy recovery facilities.

Increased disposal costs, associated with the introduction of the Landfill Tax, have led to inert materials (e.g. soils) being 'used' for a number of purposes, including spreading on agricultural land and landscaping. In many cases, the use of waste soils can be carried out under an exemption from Waste Management Licensing, provided a number of conditions are met, including pre-notifying the Agency and ensuring the activity does not result in harm to human health or the environment. However, many activities are carried out without meeting the terms of an exemption, and are consequently illegal disposals. There are a number of possible methods for addressing this problem, including an annual registration fee for exempt activities. The fee could contribute to the funding of resources required for the inspection and enforcement of these activities.

There is a lack of facilities available to householders for the disposal of asbestos cement waste. Asbestos is defined as a special waste under the Special Waste Regulations 1996. As such, asbestos can only be handled or disposed of at appropriately licensed facilities, and any movements must be pre-notified and consigned with the Agency. Household waste recycling sites within the LEAP area will not accept asbestos due to the licensing costs and administrative burdens associated with special wastes. In addition, following the implementation of the 1996 regulations there has been some uncertainty about the powers and duties of Local Authorities for the collection and disposal of asbestos from domestic properties, and the provisions that apply in relation to household waste recycling facilities. Consequently, the only site that can accept asbestos within the LEAP area is Blackborough End Landfill Site. However, a householder may only dispose of asbestos in agreement with the site operator, incurring a disposal charge, and this would still be subject to the 1996 regulations. Alternatively, a householder could employ the services of a waste contractor, incurring the associated costs. The problems associated with asbestos disposal results in a number of householders resorting to illegal disposal.

The DETR have clarified their position regarding the disposal of household asbestos cement waste, and issued guidance to the Local Government Association:

- Waste collection authorities are obligated to collect household asbestos waste on request; and
- Waste disposal authorities are obligated to arrange for the disposal of this waste and provide places where members of the public can bring waste themselves.

The Agency will urge all Local Authorities to meet their duties in respect of this matter and is willing to assist Local Authorities in attaining a consistent approach.

Key issue towards 'Managing Waste': Provision of waste management facilities for producers of small quantities of waste within the LEAP area.

We will investigate all fly-tipping incidents that come under our responsibility, in accordance with the Memorandum of Understanding with Local Authorities, within two days of notification. Enforcement action will be taken whenever evidence is available and such action is in the public interest.

Waste types for which disposal is problematic or expensive, contributing to instances of fly-tipping, include tyres, batteries, and empty gas bottles. Small businesses that produce small or infrequent quantities of waste also have difficulty in finding local facilities to accept their general waste.

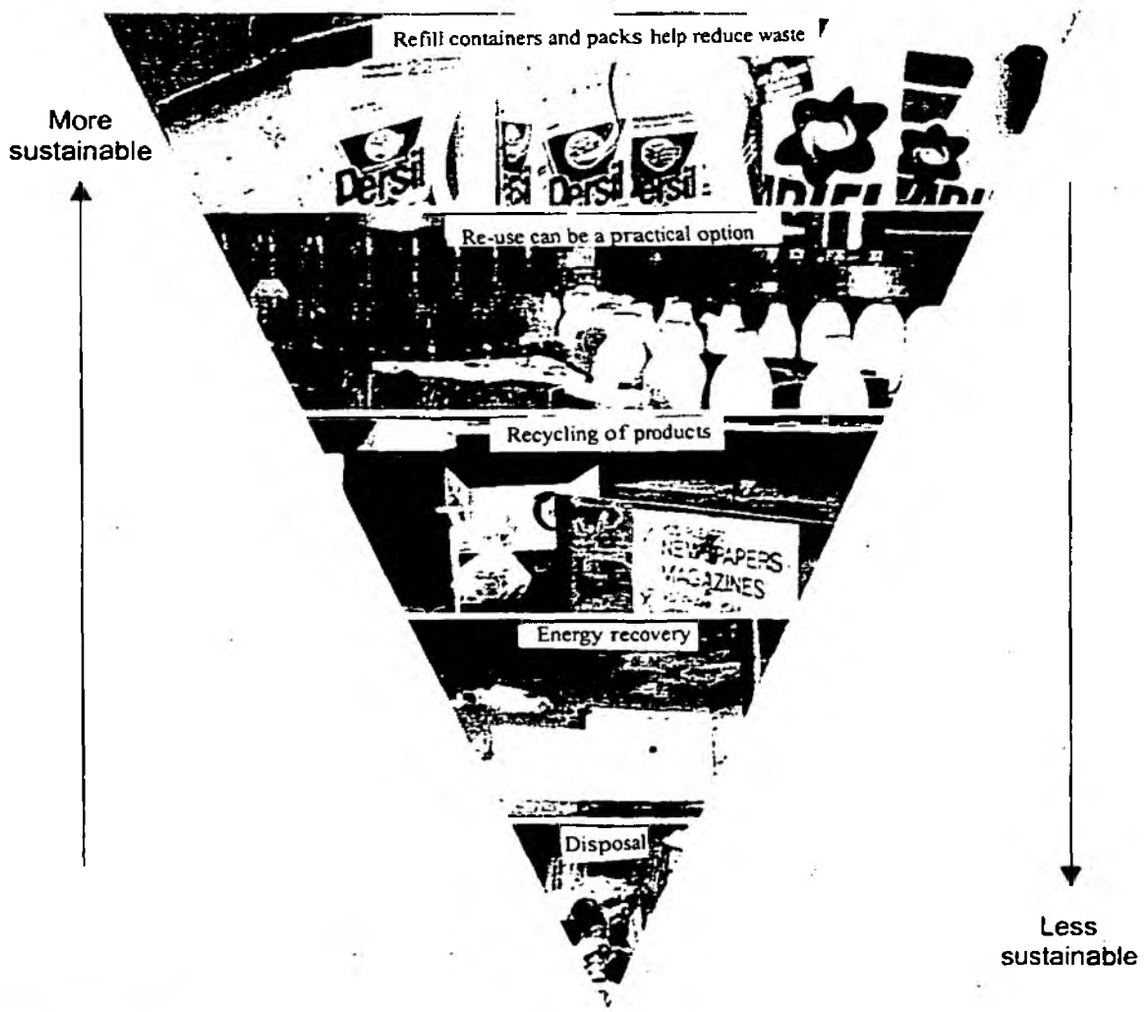
Key issue towards 'Managing Waste': Reduce the incidence of illegal waste disposal (fly-tipping) through education and enforcement of legislation.

We wish to promote recycling, reduce travelling distances, and reduce fly-tipping by supporting the provision of suitable facilities where demands are justified.

Waste minimisation (the prevention or reduction of waste at source) is the most sustainable and preferred option (refer to Figure 4.1: Waste hierarchy), and we all have a role to play in reducing the amount of waste produced. The Agency supports proposals to create waste minimisation groups, and work with others on initiatives linked to producer responsibility obligations and promotion of recycling. We will encourage organisations to implement waste minimisation action plans and other projects aimed at changing the attitude and behaviour of individuals and industry towards waste.

Key issue towards 'Managing Waste': Encourage sustainable resource use and waste management.

Figure 4.1: Waste hierarchy



Theme 5: Managing our Water Resources

We seek to manage water resources in a sustainable manner, to balance the needs of the environment with the needs of abstractors. In Anglian Region, the demands for water are progressively rising so we need to promote sustainable usage, with more efficient use of existing supplies by water companies, the public, industry and agriculture.

We can achieve this by supporting the water companies in their new duty, contained in the Environment Act 1995, to promote efficient use of water by their customers. The duty is regulated by OFWAT, with the Agency in consultation, and has required water companies to produce water efficiency plans and an appropriate level of customer charging.

We also encourage the Local Authorities and housing developers in this LEAP area to work with the local water suppliers and explore the issue of more efficient use of water in the home. Measures such as water metering, low-flush toilets, low-flow showerheads and water butts in the garden are encouraged.

Likewise, we promote the environmental and financial benefits of water conservation to industry through the adoption of best practice (e.g. the Government's Environmental Technology Best Practice Programme, environmental accreditation (ISO 14001) and waste minimisation schemes).

Finally, we actively promote the increased use of winter-stored water by both industry and agriculture.

Key issue towards 'Managing our Water Resources': Ensuring the proper use of the water resources in the North West Norfolk area.

We are committed to reviewing our water resources strategy which will consider our needs up to 2025 (it is due to be re-issued in December 2000). It will highlight the need for the Agency, water companies, OFWAT and Local Authorities to continue to work together to encourage awareness of water conservation and promote efficient water use and supply.

Theme 6: Delivering Integrated River Basin Management

Integrated river basin management is the need to reconcile the various and often conflicting demands placed on natural waters when exercising our duties relating to water quality, flood prevention, fisheries, navigation, recreation, conservation, disposal of waste waters and water abstraction. This aim is both intellectually and practically challenging to fulfil. We are always looking for opportunities to improve liaison and co-operation with other bodies such as IDBs for the collection and exchange of data for mutual benefit. However, our overall success is wholly dependent on the influences of all river users and riparian owners.

Water Quality

First time rural sewerage connection is normally requisitioned by the Local Authority from the relevant sewerage undertaker. This will be done if private sewage treatment is a threat to the environment or amenity value of the area. Anglian Water Services is the relevant sewerage undertaker in the LEAP area. Pollution data from the Agency can be supplied to the Local Authority to assist in its submission. Only factual data is supplied, not opinions, as the Agency

may have to adjudicate between the Local Authority and the sewerage undertaker in the event of a disagreement.

We will continue to investigate complaints due to sewage pollution in unsewered areas; the results of our investigations are available for use when the need for first time rural sewerage is considered.

Up to December 1998 (the latest date for which figures are available), AWS has received one Section 101A application from The Walpoles for first time rural sewerage. This application has to be appraised by AWS before any decision as to whether they will provide a sewerage scheme is made.

The Agency has recently completed the consultation stage of a proposed management strategy for aquatic eutrophication in England and Wales. A key element of the strategy is a partnership approach to the management of eutrophication. This is primarily because the control of nutrient inputs, particularly from diffuse sources, is generally beyond the remit of any one regulatory body. It is therefore important that all key stakeholders acknowledge the need to tackle eutrophication as an issue and that we work together to determine the best approach.

The River Nar Conservation Strategy highlights the impact of eutrophication and the actions that will be required to maintain the SSSI status of the River Nar. Eutrophication typically shows itself through excessive algal growth, changes in dominant macrophytes and organic silt production. This is exacerbated by low flows, which result in low dissolved oxygen levels. The Agency has focused on the control of major inputs such as STWs and now realises further work is required to address non-STW impacts. The actions are outlined in the Strategy.

Flood Defence and Warning

Through partnership with Local Authorities, we aim to minimise flooding. We will evaluate the impact of future development, through the planning consultation process, and advise on any potential increased risks. We will also explore opportunities to alleviate existing flooding problems through partnership with the relevant bodies. Local Planning Authorities (LPAs) have been issued with 1999 Indicative Floodplain maps: sharing this information should help protect flood risk areas from inappropriate development.

A project is underway to establish which properties are at risk from flooding, the most appropriate form of communication (including consideration of the establishment of local warden schemes) and recommending further warning sites. Its findings will be published in the financial year 2001/2.

In September 1996, we became responsible for taking the lead role for flood warning with two main targets by the year 2001:

- 80% of properties which are covered by the flood warning service to receive a warning prior to any flooding; and

- For people living and working in 52% of properties covered by the flood warning service to take appropriate action (e.g. sand-bagging).

However, for tidal flooding on the Norfolk coast, Norfolk Police still have the lead role for disseminating flood warnings. This is the only area of England and Wales where the Agency does not have the lead role.

A Flood Warning Public Awareness campaign has recently been undertaken to raise awareness of flood risks, encourage self-help, clarify the Agency's role and improve the public's understanding of flooding issues.

Key issue towards 'Delivering Integrated River Basin Management': Provide an effective flood warning system. In addition to the Agency's flood warning role, the defences are patrolled, structures are checked for blockages and any emergency repairs carried out. County councils, district councils and the Fire Service may also offer assistance during floods. The Agency has set up a telephone information service known as *Floodline* (0845 9 88 11 88).

Recreation

The Agency is required to encourage and further the growth, development, progress or establishment of the use of inland and coastal waters and land associated with such waters for recreational purposes, as specified in Section 6 of the Environment Act 1995.

In North West Norfolk, the Agency has been extremely active in achieving recreational improvements in partnership with a number of other organisations.

The Fen Access Project, in which the Agency is a partner, aims to create new and enhanced countryside access and recreation opportunities within the unique landscapes of the Fens. It will create up to 78 km of networked trails in an area south-east of Downham Market, providing a significant facility for horse-riders, cyclists and walkers. The other key partners in the project are Norfolk County Council, King's Lynn and West Norfolk Borough Council, Fens Tourism Group, British Trust for Conservation Volunteers and the Countryside Agency who together are expected to contribute nearly £100 000. A bid for a further £71 500 has been submitted to the Government Office, Eastern Region, for European Objective 5b funding.

In this area we will also be working with Sustrans, a charity that promotes the use of cycles and cycleways, on the National Cycle Network. This Network will comprise over 6 500 miles of routes for cyclists in England, Scotland, Wales and Northern Ireland. Route 103, which will run between Harwich and Boston, is scheduled for completion by 2005. This route proposes to utilise the sea wall between Hunstanton and Heacham and Agency-owned land along the Tidal River; however, there are a number of issues that need to be addressed by Sustrans and the Agency. The suitability of current surfaces will have to be surveyed and, if resurfacing is required, the effects on bank integrity will have to be investigated. Many of the proposed sections of the route are also along banks where there is no existing right of way; therefore, legal agreements will need to be reached. In past projects, permissive access has been allowed. The issue of liability for cycling on Agency-owned land would also need to be resolved.

The Fen Rivers Way Footpath, formerly running between Cambridge and Ely, has now been extended to King's Lynn. We have been working closely with Norfolk County Council to extend the path along the Ely Ouse River and Tidal River. Much of the route is across Agency-owned land, and appropriate facilities such as styles and gates have had to be put into place. Where no right of way exists, negotiations with other users have been undertaken. Norfolk

County Council has also installed finger posts and waymarkers and developed a route map leaflet.

Navigation

An Action Plan for Navigation, which was published by the Agency in 1998, describes how we intend to take forward our integrated and long-term approach to navigation. Our principal aim is to maintain and improve navigation as assets of recreational, environmental, economic and social value. However, the Agency recognises that funding adequate investment in the infrastructure (e.g. locks and weirs) is a major challenge.

In order to improve navigation in this area, we have been and will be working in partnership with a number of organisations, and exploring sources of external funding.

The Agency is currently undertaking a feasibility study assessing the potential for developing navigation facilities on the Great Ouse Relief Channel. Denver is connected to King's Lynn via the navigable tidal Great Ouse. However, the strong tides and shifting silt banks of the tidal river make navigation very difficult and essentially impractical under most conditions. There remains a strong demand for a safe route from the inland Ely Ouse system to King's Lynn, both for leisure and tourism and for commercial development. The Relief Channel could provide just such a route.

In 1999 we submitted a business plan to the Government Office Eastern Region and were successful in gaining 50% funding for the project under European Objective 5b. We will meet this by supplying the remaining money. With a total cost of £1 180 000, the project would, subject to the feasibility study, be undertaken in three stages. The first stage would be construction of a lock at Denver; this would be followed by the creation of the navigation facilities on the Relief Channel, and the final stage would be to improve navigation facilities on the Ely Ouse.

The project would create an additional 17 km of navigable waterway and could attract additional boats and associated visitors to the Relief Channel, leading to increased visitor spend in the area.

We are also a key partner in implementing the actions of the Fens Waterway Regeneration Strategy. This Strategy, commissioned by the Fens Tourism Group in 1997, studies the potential of the Fens Waterways as a recreation and leisure resource. The Strategy concluded that there is much scope for development and much to promote. In 1998, a three-year action plan was developed for the Strategy's priority focus area on the Middle Level and Great Ouse system (which includes regions within the LEAP area). Funds for the actions will come from the Agency, the private sector, Middle Level Commissioners, Local Authorities, Parish Councils, Countryside Agency, angling clubs and the European Regional Development Fund.

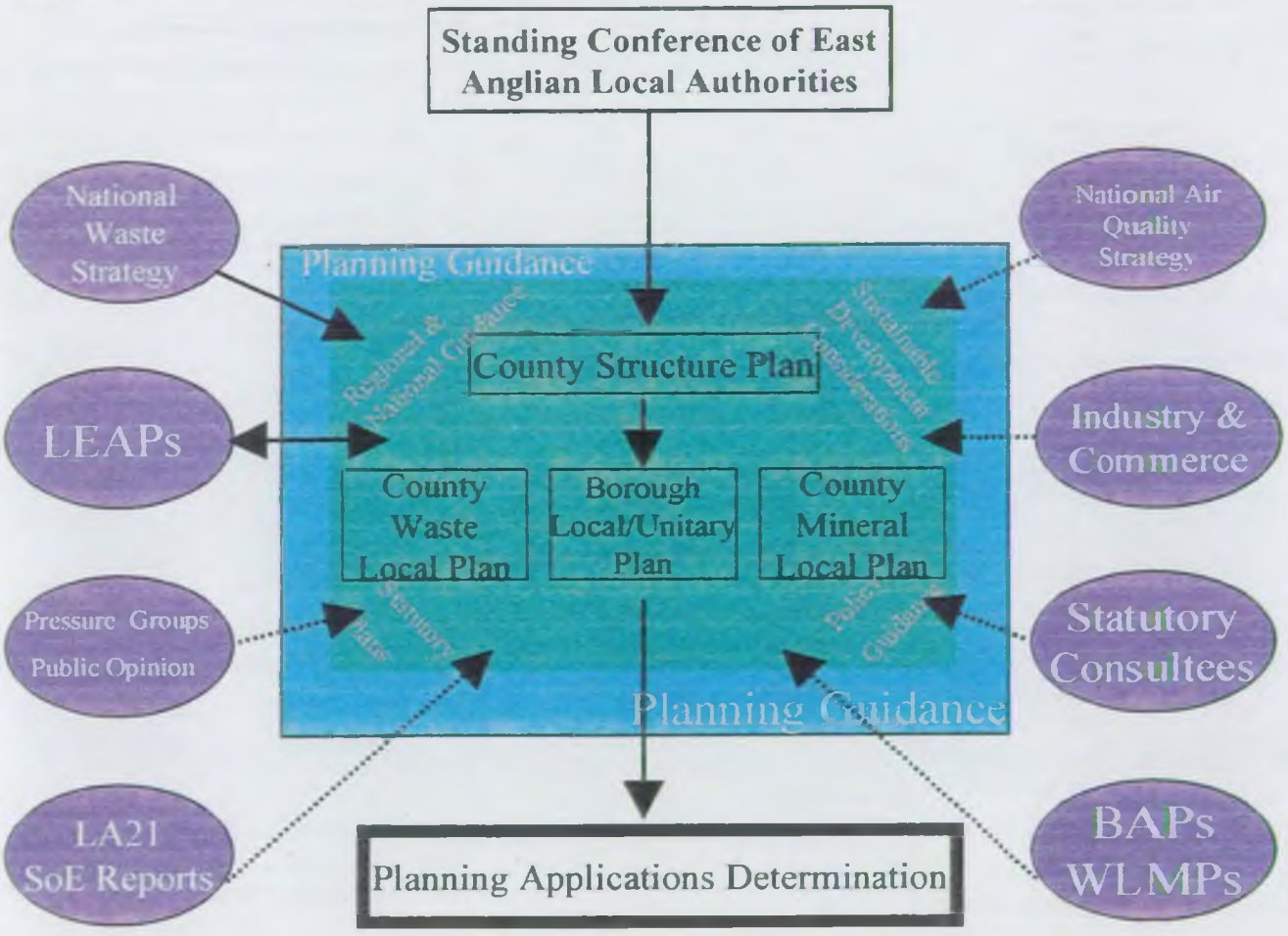
Key issue towards ' Delivering Integrated River Basin Management': The need to build long-term plans with Local Authorities to provide sustainable navigation and other recreation in this LEAP area.

Theme 7: Conserving the Land

Land use planning

Land use is the single most important influence on the environment and, depending on the type, it can be either beneficial or detrimental. The control of land use change is primarily the responsibility of LPAs. Their development plans (Structure and Local Plans) provide a framework for land use change and are key considerations in the determination of planning applications. The Agency has a responsibility to protect and enhance the environment; however, we have limited control over the way that land is developed. Therefore, we have to work closely with the LPAs in order to achieve our environmental aims (*refer to Figure 4.2*):

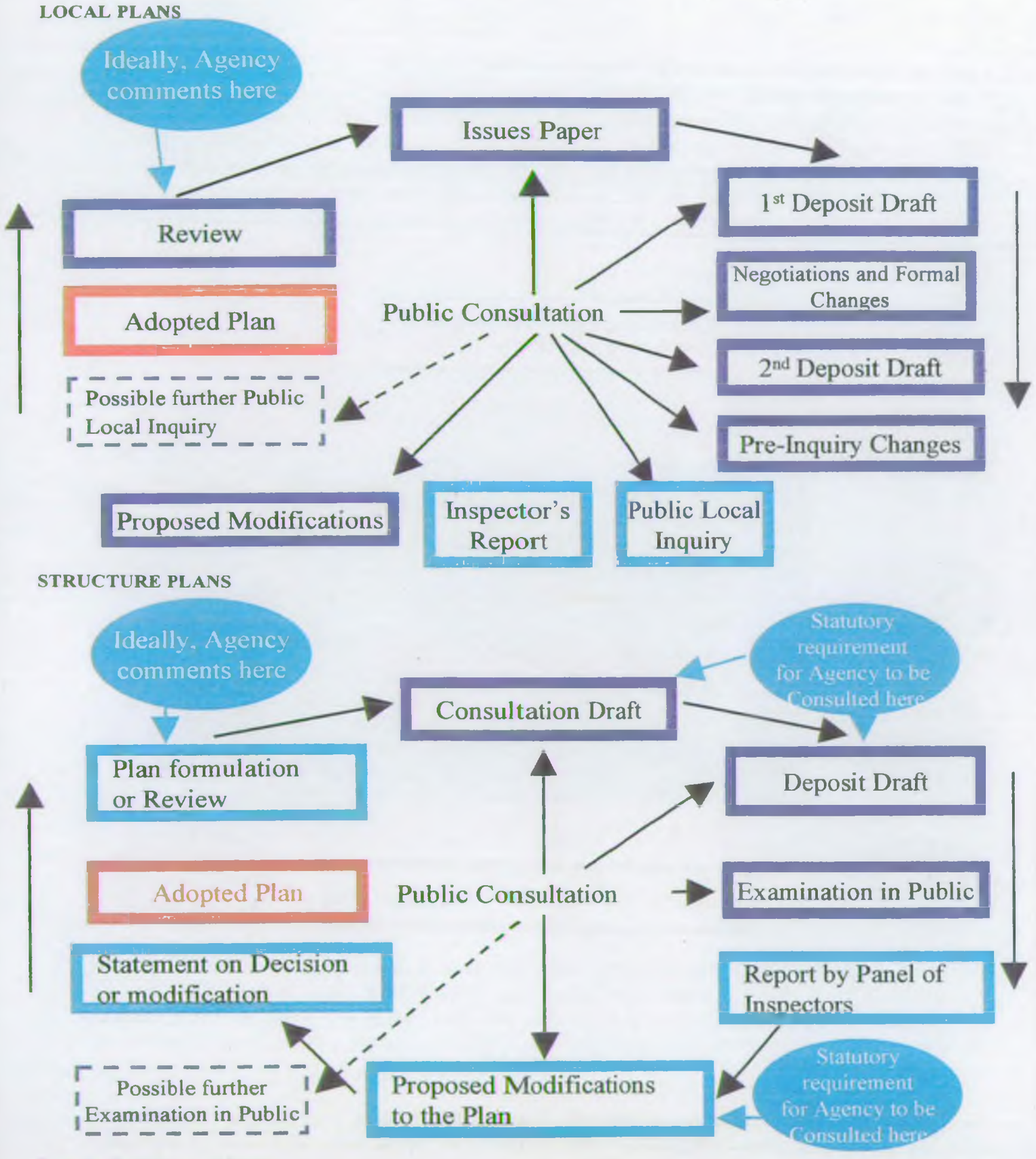
Figure 4.2: Influences on land-use change



The policies in these plans will guide the way that land is developed. We advise planning authorities to help them to implement plans that protect the environment from harmful development. We reinforce these policies, where possible, when we comment (as a statutory consultee) on planning matters (refer to Figure 4.3). The Development Plans relevant to this area are shown in Table 4.1.

We are eager to be consulted on all relevant aspects of the Town and Country Planning Act system and for planning applications. We realise the importance of proper consultation, including, if required, support for subsequent issues.

Figure 4.3: Simplified development planning cycles



Local planning guidance

The NRA (one of our predecessor bodies) produced a set of statements in the document *Guidance notes for Local Planning Authorities on the Methods of Protecting the Water*

Environment through Development Plans (1994). These statements provide a general guide to the policies we believe should be included in local plans and why they are important. This guidance has been updated to cover all the Agency's functions and was published earlier this year. We have also produced a document entitled *Environment Agency - Liaison with Local Planning Authorities* (March 1997) which explains our role and contribution to the land use planning system and is intended to help Local Authority planners in their routine contact with us.

Table 4.1: Development Plans in the LEAP area

STRUCTURE PLANS	**CURRENT STATUS**
Cambridgeshire County Council	Adopted December 1995. Review will be undertaken jointly with Peterborough City Council. Capacity Study undertaken in part to begin a review of this plan
Norfolk County Council	Adopted March 1993. Consultation on the Deposit Draft Review ended in March 1998. Examination in Public November 1998. Panel Report received February 1999. Proposed Modifications May 1999
MINERALS/WASTE PLANS	**CURRENT STATUS**
Although LEAPs can play a role in informing Local Authorities of local waste management practices and pressures they will not be driving our strategic waste planning work or seeking to identify locations for waste management facilities. We hope to be in a position to assist Local Authorities and regional planning conferences by producing Strategic Waste Management Assessments and local waste management statements for development planning purposes	
Cambridgeshire and Peterborough Waste Local Plan	Joint Plan with Peterborough CC Consultation Draft July 1998 Deposit Draft anticipated late 1999
Cambridgeshire Aggregates Local Plan	Adopted August 1991, the Plan will be reviewed after the results of the National Aggregates Monitoring Survey
Norfolk Waste Local Plan	Deposit Draft consultation period ended October 1997 Public Local Inquiry January 1999
Norfolk Minerals Local Plan	Adopted December 1996. Review out to consultation
LOCAL PLANS	**CURRENT STATUS**
Breckland District Council	Deposit Draft plan 1996 Public Local Inquiry October 1997. Inspector's Report published December 1998 Proposed Modifications Report April 1999
King's Lynn and West Norfolk Borough Council	Adopted November 1998
Fenland District Council	Adopted August 1993 Deposit Draft Alteration April 1999

Note:
The stages in the preparation of Local Plans prior to their adoption is as follows: consultees and members of the public may initially comment on a consultation draft of the local plan. A deposit draft is then available for a statutory six-week period, after which all representations are considered. A public inquiry is then held, at which objections to the plan are considered; objectors can be represented in person and evidence cross-examined. An inspector considers all objections raised and produces a report on recommended changes to the plan. The planning authority may then accept the recommendations and adopt the plan or propose modifications, in which case there is a further period of public consultation. This process may be repeated with further modifications and, in exceptional circumstances, a second public inquiry. Once it is satisfied that all objections have, as far as possible, been accommodated, the planning authority will give notice of its intention to adopt the plan.

We take a proactive approach to our involvement in the planning system - as well as commenting on regional guidance, structure and local plans, we also consider planning applications in depth.

We are required under Section 105 of the Water Resources Act 1991 and Circular 30/92 *Development and Flood Risk* to carry out a survey of flood defences within our area to define the nature and extent of flood risk. This includes determining the area at risk from a 1:100 year return period flood. A pilot study to determine how this could best be achieved has been undertaken. It is intended that this programme is to be undertaken over a three to five year timescale. The results of the survey will ultimately be available to Local Authorities to aid the production of their development plans. Until this survey information is available, existing flood level records will continue to be used to help guide development.

The planning system generally, and the use of planning conditions in particular, should not duplicate the controls imposed by the pollution control bodies e.g. the Agency and Local Authority Environmental Health departments.. Clarification is provided in Planning Policy Guidance Note 23: *Planning and Pollution Control.*

Key issue towards 'Conserving the Land': Safeguard limits of floodplain areas, protect storage capacity and extent of the floodplain for flood risk areas. Operational access for maintenance activities must also be considered.

Key issue towards 'Conserving the Land' and 'Managing Our Water Resources': There is a need to ensure that the ability to supply water to new developments is assessed before a decision on the location is made. This would best be facilitated by joint discussions between planners, water companies and us at the earliest possible stage.

Groundwater resources can be put at risk by a wide range of human activities. These can create specific point sources of pollution or diffuse pollution of varying intensities. Such activities are controlled by legislation and may also be subject to guidelines and codes of practice which have varying degrees of statutory force. We have set some rules and guidelines as to which activities can be permitted or recommended within different groundwater Source Protection Zones. These are clearly tabulated in our Groundwater Protection Policy document. The aim of this is to assist in the prevention of contamination of land and groundwater through human activities.

Key issue towards 'Conserving the Land': Source Control is the umbrella term for managing surface water run-off from developed areas in such a way that the water is returned to ground or stored in reservoirs or wetlands and released in a controlled manner. The aim is to minimise the risk of flooding and pollution, by working more in tune with natural processes; examples include permeable pavements, swales and balancing ponds. There is a need to promote best practice in such techniques and encourage Local Authorities and developers to adopt them, whilst appreciating the need to consider their long-term maintenance. Our long-term aim is to be able to advise where such techniques are applicable as part of an overall drainage assessment.

Whilst development does not actually produce water, it does increase run-off rates and it is unlikely that rural watercourses will have much residual capacity to cope with even relatively small increases in flow rates.

Where downstream watercourses cannot be improved because of riparian ownership or physical constraints it is common to attenuate surface water flows to the pre-development run-off rates. The attenuation of flows results in the need to store waters in associated balancing lagoons, ponds or tanks. The English Common Laws relative to riparian rights are well proven and when invoked are very powerful. With this in mind, it is prudent for the LPA to ensure that all drainage works and associated structures are publicly adopted in perpetuity with the development served.

Road transport is not our responsibility; however, it does affect the environment and cuts across many of our nine themes. Through our National Centre for Risk Analysis and Options Appraisal we have influenced the recent government review of trunk road schemes to highlight the potential impact they may have on the water environment and so that future plans take into account environmental impacts. We consult with road builders and contractors to promote good environmental practice, as road construction can have a detrimental impact on the environment.

Another issue with long-term implications is the management of contaminated land and 'brownfield' developments (re-development of previously developed land). In this case, environmental protection can only be secured through successful collaboration between Local Authorities, the Agency, owners and developers.

Many of the landfill sites that were closed prior to the Control of Pollution Act 1974 may be producing landfill gas. Gases such as methane are explosive and therefore have the potential to damage local properties. Other landfill gases - such as carbon dioxide - can cause asphyxiation in high concentrations. These sites may be subject to consideration under the Contaminated Land Regulations, which are due to come into force at the end of 1999.

Theme 8: Managing Our Freshwater Fisheries

Our vision for fisheries is for all waters of England and Wales to be capable of sustaining healthy and thriving fish populations to give everyone the opportunity to experience a diverse range of good quality fishing. To achieve this, we are restoring fish to all rivers as required and seeking to improve river habitats so that fish populations prosper. Good water quality and adequate flows are a prerequisite for healthy fish populations. This means that many water quality and water resource issues have a link to this theme. Issues such as the water company investment plans have the biggest potential benefits to fisheries. Construction of storage reservoirs, potable water abstraction and inter-river transfers may all impact on fisheries.

Key issue towards 'Managing Our Freshwater Fisheries': We will identify and undertake appropriate habitat enhancement projects, and wide consultation with angling and other interested parties will continue.

More than one million anglers buy licences annually, thereby contributing over 60% of the cost of our Fisheries service. The Government contributes most of the remaining funding. Riparian owners, although not paying any of our fisheries costs, also have a major interest. Our key stakeholders are: Government (central and local), general public, netsmen, anglers and fishery owners. We work closely with a range of governmental organisations and a large number of non-governmental organisations to fulfil our responsibilities. Our closest partners/contacts in the Anglian Region are:

- Ministry of Agriculture, Fisheries and Food (MAFF);
- Country Landowners' Association;
- Salmon and Trout Association;
- National Federation of Anglers;
- Specialist Anglers Conservation Group; and
- English Nature.

In partnership with King's Lynn Angling Association (AA), the Agency has been working to improve the Relief Channel fishery. This watercourse's primary function as a flood relief channel leads to difficulties with management of the fishery, due to a combination of high flow rates and the uniformity of the channel. The Agency and its predecessor organisation, the National Rivers Authority, have undertaken a series of enhancement works aimed at providing spawning habitat and refuge areas for fish during high flows. In 1996, the Agency commissioned a pioneering £60 000 project to design and install 15 artificial reefs in the channel at sites near Downham Market and Stowbridge. Each reef structure occupies a volume of 13 m^3 and weighs 2 tonnes, enabling them to withstand high flow rates. An additional benefit of these structures is that they provide a large surface area for algal and invertebrate production, which will boost the food supplies and spawning substrate for the resident fish population.

The following year, to complement these structures, 46 brushwillow croys were installed at similar locations to provide marginal refuge areas for fish. These structures extend 5 m into the watercourse at right angles to the bank (see Figure 4.4 below). A further project undertaken in 1999 saw the installation of six boulder and gabion croys at Magdalen Bridge, a popular angling location on the channel. These boulder croys extend 10 m into the channel and were installed with the aid of divers at a cost of £13 000. The status of the fishery and the success of the enhancement works are being monitored through hydro-acoustic surveys, special netting surveys and close liaison with King's Lynn AA.

Figure 4.4: Brushwillow croys in the Relief Channel

We are also working with King's Lynn AA to improve angling facilities on the Cut Off Channel; together we have installed kissing gates, car parks and we have installed over 50 angling platforms.

Theme 9: Enhancing Biodiversity

Enhancing biodiversity is an aspiration that no single organisation can achieve alone. One way we can contribute is by playing our part in the Local Biodiversity Action Planning (LBAP) process. Local Authorities and environmental organisations make up working groups responsible for compiling Biodiversity Action Plans (BAPs) which include targets for specific habitats and species (see Chapter 4.2).

Key issue towards 'Enhancing Biodiversity': The need to ensure that the targets agreed in BAPs become incorporated into the routine work of the Agency and the partner organisations so that real environmental improvements can be demonstrated.

The benefits of the partnership approach in enhancing biodiversity can be demonstrated by the progress of Water Level Management Plans (WLMPs) in the LEAP area. These plans are developed with the co-operation of other environmental organisations, such as English Nature and RSPB. The status of the plans in the North West Norfolk area are set out below:

Table 4.2: Water Level Management Plans

COUNTY	SITE	NATIONAL GRID REFERENCE	STATUS
Norfolk	Boughton Fen	TF 718 015	Draft
Norfolk	River Nar	-	Covered in Nar Conservation Strategy (12/98)

We need to protect native species and habitats to increase biological diversity. Baseline surveys for otter and water vole have been undertaken throughout the area in a collaborative project between ourselves, English Nature, Local Authorities, County Councils and Norfolk Wildlife Trust.

4.2 Local Agenda 21 and Biodiversity Action Plans

4.2.1 Local Agenda 21

Agenda 21 evolved from the 1992 Earth Summit at Rio de Janeiro and the concept is to set an agenda for action for the 21st century at a local level. It emphasises the need to encourage local action to implement the aims of global environmental policy; in other words '*think globally, act locally*'. This was one of a number of agreements signed by some 150 countries, which also include conventions on climate change and biodiversity. It is intended to be a 'comprehensive programme of action needed throughout the world to achieve a sustainable pattern of development for the next century'.

In response to the Earth Summit, the government has produced a number of strategy documents. These include the *UK Sustainable Development Strategy* and more recently it has published

Indicators of Sustainable Development in the United Kingdom. This sets out a comprehensive list of aspects of sustainable development that should be measured and identifies indicators for each aspect.

Local Authorities are seen as the focus for promoting and encouraging local community action. Since the Earth Summit, Local Authorities have been charged with producing a Local Agenda 21 (LA21) for their area which aims to encourage wider access to information, greater community participation in decision making and the adoption of sustainable development principles. We support that approach by providing information, expertise and support. An Agency LA21 Information Pack was launched in March 1998.

At a local level, most councils are working with communities, employers and industry to produce their own Environmental Reports/Action Plans and subsequently their own LA21 programmes. For example:

- Cambridgeshire County Council's *Environment 2000 - a Strategy for Action* (July 1997) included a review of the county's State of the Environment report and is now complete. Work and consultation on LEAPs is still on-going;
- *Cambridgeshire and Peterborough State of the Environment Report 1998* has been published;
- Norfolk County Council, in a joint publication with the Agency, has produced the *Norfolk Environmental Overview* (March 1999).

In addition, numerous groups and forums have been established, such as the Cambridgeshire LA21 Round Table, the Norfolk 21 Initiative and, at a Local Authority level, the Breckland Environmental Forum. On 21 September 1999 we launched our *Environmental Snapshot for the East of England.*

Key issue towards achieving a 'LA21': The need to determine with Local Authorities how we can appropriately link the issues being generated by LA21 and the Agency's routine work including LEAPs. We are supporting the initiative but the long-term implications and resource needs have not yet been considered.

4.2.2 Biodiversity

The UK Action Plan published in 1994 sets out the broad strategy for conserving and enhancing wild species and wildlife habitats in the UK for the next 20 years. The stated overall goal is 'to conserve and enhance biological diversity within the UK and to contribute to the conservation of global biodiversity'. Biodiversity will be a key indicator of the successful implementation of sustainable development in the plan area.

At a local level, Local Authorities and environmental organisations, including the Agency, are compiling Biodiversity Action Plans (BAPs) which will include targets for specific habitats and species (many of which are relevant to this area), such as fens, reed-beds, otter and water vole.

It is crucial to the success of the BAP process that wide-ranging participation is achieved in a realistic timescale. The Action Plans should not only be the vision of participating organisations but should also be shared by others throughout each county. Plans will not be achieved unless

landowners, farmers and managers are involved in the decision-making process, so wider community involvement is encouraged.

Biodiversity Action Plans can be obtained from the Biodiversity Co-ordinator of the relevant county council.

Table 4.3: County Biodiversity Action Plans

COUNTY	PARTNERS	DOCUMENT	THEMES/HABITAT TO BE CONSIDERED
Cambridgeshire	Cambridgeshire CC Peterborough CC RSPB Agency Wildlife Trust for Cambridgeshire Cambridge City Council East Cambridgeshire DC Fenland DC Huntingdon DC South Cambridgeshire DC Landscape 2000 English Nature	*Cambridgeshire Local Biodiversity Action Plan*	Fens Floodplain grazing marsh Reedbeds Cereal field margins Species-rich ancient hedgerows Lowland calcareous grassland Road verges
Norfolk	Norfolk WT English Nature Norfolk CC RSPB Agency MAFF	*Action for Wildlife: Biodiversity Action Planning in Norfolk*	Cereal field margins Ancient and/or species rich hedgerows Coastal and floodplain grazing marsh Lowland heath Fens Reedbeds Saline lagoons Seagrass beds Mesotrophic lakes

This information was taken from the Joint Nature Conservancy Council website: http://www.jncc.gov.uk

4.3 Education and Awareness

The Agency has a duty to promote the recreational use of inland waters and associated land. Local waterways offer considerable opportunities to access sites of natural beauty, historic interest and wildlife importance. Public enjoyment and interest can be enhanced through interpretation boards and visitor centres. The production of information boards and leaflets is routinely undertaken through partnerships with Local Authorities, consultation groups and riparian owners.

At King's Lynn, we and our key partners (King's Lynn and West Norfolk Borough Council, Norfolk County Council, Norfolk Museums' Service, RSPB and English Nature) have been collaborating on the North Sea Haven Millennium Project. This project aims to re-focus the town towards its river and connections with the sea and make the most of its environment for the pleasure and education of its residents and visitors. This £4.1 million project has received an award of £2 million from the Millennium Commission. An important feature of the project is the development of Marriot's Warehouse into the Green Quay Exhibition Centre, dedicated to the

natural environment of the Wash. Planned to open in 2000, it will include an aquarium, audio/visual displays and a café. Other components of the North Sea Haven Millennium Project are:

- Transformation of the Outer Purfleet by dredging, restoring water to it and reducing siltation through the installation of a barrage. Boats will then be able to moor on the quayside for the first time in nearly 30 years;
- King Staithes Square will have its flood-wall moved and, where the silos once stood, a large public space with a covered concert platform will be built;
- Along the South Quay there will be sheltered seating, plus road and pavement resurfacing; and
- A boardwalk in West Lynn will be installed to create a link between the Nar Valley and Peter Scott walks. A new ferry pavilion and car park will improve facilities for people using the ferry and the walk.

One of our key objectives for environmental protection and improvement is education. Damage is often caused not through malicious intent to harm the environment but through lack of awareness. Therefore, we feel we need to have a greater involvement in education at all levels. Our education strategy *Green Shoots* (1997), which considers education into the next century, outlines the following goals:

- to help educate young people through teaching aids and other initiatives;
- to improve understanding of environmental issues, through links with education, work placements and an awards scheme;
- to work with industry and produce marketing campaigns to promote prevention of pollution rather than its remediation;
- to foster public awareness of environmental issues to encourage responsibility for the environment and its challenges; and
- to build on established and create new international relationships to further sustainable development.

A range of education material is already available on request.

We perceive education to include all aspects of our society, not just education through schools and colleges. We will be one of a number of organisations working in this realm and we are open to suggestions for joint approaches. We hope to see environmental topics dovetail into the National Curriculum and are committed to providing information to 'A' level and university students.

We welcome any feedback on how the Agency could get more involved within the North West Norfolk LEAP area.

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CHAPTER FIVE – NEXT STEPS

5.0 Next Steps

This Draft LEAP has been produced following detailed consultation and discussion between the Agency's Project Team, the North West Norfolk Stakeholder Group (refer to Chapter 3.1) and a Sub Group of the Great Ouse Area Environment Group (AEG).

The AEG consists of 27 members, from different walks of life, who have broad experience and interest in environmental matters. These members usually have technical expertise, contacts with industry (including agriculture) or hold a public service position. The AEG is a forum through which we seek local opinion on environmental issues, and it is fundamental in assisting us in building relationships with local communities. One of its roles is to advise and comment on the LEAP process and discuss priorities, proposals and key issues within the Plan. To provide more focused input, 7 members with particular interest in North West Norfolk were nominated as the AEG Sub Group for this area.

This Draft LEAP has been published as a means of consulting formally with organisations, groups and individuals interested in the future of the local environment. Consultation will enable us to:

- highlight local issues to a wide audience and establish if any additional issues need to be considered; and
- ensure decisions on the future management of the locality are based on accurate information and the fullest possible range of views from interested parties.

Most importantly, this allows us to gain feedback on the issues and options for management, which can be fed into the next stage of the process.

Consultation will begin with the following activities:

- Press release to advertise the Draft LEAP;
- Distribution of the Draft LEAP to key partners and consultees; and
- Display of leaflets and posters at local authority offices and libraries.

Consultees have until 4 April 2000 to submit responses, in writing, to the address shown on the front cover.

After the consultation period, all responses will be considered in detail before the LEAP is produced (due September 2000). A summary of comments received, together with our replies, will be published in a Statement of Consultation, which will be distributed to all those who responded.

The LEAP should influence the policies and actions of planning authorities and developers, as well as aiding day-to-day management of the local environment. We will pursue and implement the actions that are identified, collaborating with other organisations where appropriate. Progress will be reported in Annual Reviews, and after five years the LEAP process will be repeated.

The information and views that you can provide are very important steps in the overall process. It is hoped that you will respond positively to this initiative, so that a shared vision for the North West Norfolk LEAP area can be developed and realised.

APPENDICES

APPENDIX A: DUTIES, POWERS AND INTERESTS OF THE 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; and
- 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 summarises our duties, powers and interests and their relationship to land-use planning.

The Agency has powers to:	**The Agency has an interest (but no powers) in:**	**Partnership**
Water Resources: The Agency has a duty to conserve, redistribute, augment and secure the proper use of water resources.		
◆ Grant or vary water abstraction and impoundment licences on application. ◆ Revoke or vary existing licences to reinstate flows or levels to surface-waters or groundwater which have become depleted as a result of abstraction, and are subject to a liability for compensation. ◆ 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. ◆ 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 river 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). ◆ Produce flood risk maps for all Main Rivers under S105	◆ Granting of planning permission throughout a catchment but especially floodplains where development can significantly increase flood risk. Local Planning Authorities grant this permission. ◆ Installation of surface water source control	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. The Agency will encourage best practice, including source-control measures and common standards, among Local Authorities, IDBs and riparian owners to protect and enhance the environment. The Agency

The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
of Water Resources Act 1991. ◆ Undertake works to Main Rivers using permissive powers. ◆ Issue flood warning relating to Main River to the public, Local Authorities and the police. ◆ Consent mineral workings within 16 metres of Main Rivers.	measures e.g. flood attenuation structures. ◆ Works improving ordinary watercourses and which are normally under Local Authority remit, but may impact on Main Rivers. ◆ Installation of buffer zones which reduce flood risk and have significant environmental benefits. ◆ Urban and rural land use and measures that can reduce flood risk or the need for watercourse maintenance.	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, groundwater, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.		
◆ Issue discharge consents to control pollution loads in controlled waters. ◆ Regulate discharges to controlled waters in respect of water quality through the issue and enforcement of discharge consents. ◆ Prosecute polluters and recover the costs of clean-up operations. Issue groundwater authorisations and notices. ◆ Adjudicate in Section 101A (first-time sewerage) appeals. ◆ Serve notice on a site owner or operator to conduct works to forestall pollution.	◆ The control of run-off from roads and highways. This is a Highway Agency duty. ◆ The greater use of source-control measures to reduce pollution by surface-water run-off. ◆ Prevention and education campaigns to reduce pollution incidents.	The Agency will liaise 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 1 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. ◆ 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. ◆ 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. The Agency wishes to liaise with Local Authorities in the production of their Air Quality Management Plans. The Agency will advise and contribute to the government's National Air Quality Strategy.

The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Radioactive Substances: The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.		
◆ To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public.	◆ The health effects of radiation.	The Agency will work with users of the radioactive 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. The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites. 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. ◆ Suspended and revoke licences. ◆ 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. ◆ Prevent future land contamination by means of its IPC, Water Quality and other statutory powers. ◆ 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, 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. ◆ 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 protect the integrity of such sites or species. ◆ Implementation of the UK BAP for which it is the contact point for 17 species and four habitats.	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. The Agency will work with developers, Local Authorities, conservation bodies and landowners to conserve and enhance biodiversity.

The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
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 liaise 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. ◆ Make and enforce fisheries bylaws to prevent illegal fishing. ◆ Promote the free passage of fish and consent fish passes. ◆ Monitor fisheries and enforce measures to prevent fish-entrainment in abstractions. ◆ 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 done by the Sport England and other sports bodies.	The Agency will work with the Countryside Commission, the Sport England, 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.		
◆ Maintain river navigation. ◆ Maintain and operate locks and associated weirs and sluices whilst providing access to these sites. ◆ Provide services such as moorings and pump-out facilities. ◆ Maintain navigation by a system of licensing. ◆ Enforce navigation legislation.	◆ The management and operation of British Waterways navigations and other navigations within the region.	The Agency will work with British Waterways, navigation authorities and navigation users to improve navigations generally as valuable environmental, recreational, commercial and heritage resources.

APPENDIX B: THE ROUTINE WORK OF THE AGENCY

On a day-to-day basis, the Agency carries out a huge environmental monitoring and regulatory operation, most of which is to achieve statutory requirements. The aim of regulation is to balance the needs of people and the environment. The Agency works to:

- save, redistribute and improve river, lake, reservoir and groundwater supplies;
- prevent and control pollution of air and water;
- reduce the risk of harm from contaminated land and bring it back into use;
- make sure waste is dealt with safely and legally;
- make sure radioactive materials are kept, used and disposed of safely; and
- make sure flood risks are not created or exacerbated.

Regulating the environment takes place through licensing. The Agency manages licences for abstraction of water from rivers and boreholes, releases to air and water, the carrying and disposal of waste and to carry out work in, over, under or near a watercourse. Within Central Area we manage over 3,200 water abstraction licences, 3,200 consents to discharge to water, 300 waste management licences, 77 authorisations under Integrated Pollution Control for processes which make releases to air and 70 permits for radioactive materials and waste. We determine approximately 400 applications each year to work on or near water.

We monitor the environment to ensure that pollution is controlled and resources are adequately protected. We regularly monitor the quantity and quality of rivers, estuaries and the sea and check emissions from the processes we regulate. Results are reported on a public register, which can be inspected at the Agency's main offices. We run a 24-hour service for receiving reports of and responding to flooding and pollution incidents/emergencies in the air, water or on land. We also work with others to reduce the risk of harm from contamination and to bring land back into good use.

We work to minimise waste and prevent pollution through advice and education, including national campaigns and through working with other environmental regulators. When necessary, we are prepared to enforce environmental legislation in a tough way. Those who show little regard for the law and who cause blatant and persistent damage to the environment can expect to be prosecuted.

The Agency also has the role of reducing risk to people and the environment from flooding by providing effective defences. Protecting life is our highest priority and to meet this aim we provide a flood forecasting and warning service and discourage development in flood-risk areas. We also manage over 900 km of flood defences and aim to protect and improve the natural environment by promoting flood defences that work with nature.

We are responsible for maintaining, improving and developing fisheries. We regulate fisheries by issuing licences for rod angling and net fishing. We carry out improvements to fisheries by improving the habitat and fish stocks and providing advice to fishery owners. The Agency seeks to ensure that wildlife, landscape and archaeological heritage is protected in any work that we carry out and also in work carried out by others.

Our principal aim for recreation is to protect, improve and promote the water environment for recreational use. We do this by protecting existing use and creating opportunities in the course of our work and by maximising the use of Agency-owned sites for recreation.

Our principal tasks for navigation include maintaining river navigations and maintaining and operating locks, weirs and sluices (and providing public access at these sites). We also register and license boats using our navigations, provide services such as moorings and pump-out facilities and enforce local legislation and byelaws.

Although we operate an extensive regulatory framework, our actual control over development is limited. We therefore depend upon effective liaison with planning authorities. We liaise with planning authorities under the Town and Country Planning legislation and Government planning guidance by providing co-ordinated responses on development plans and planning applications in order to:

- advise on where proposed development may pose a risk to the public or to property from pollution and/or flooding;
- protect the environment from any possible adverse effects of development;
- wherever possible, enhance the environment in conjunction with development proposals;
- identify demands on our duties and responsibilities, including flood protection, water resource management, conservation and recreation; and
- avoid unnecessary conflict between the use of planning conditions and any possible consents or licences required by the Agency.

Close co-operation between planning authorities and ourselves is essential for effective environmental protection and progress towards more sustainable forms of development.

APPENDIX C: GLOSSARY AND ABBREVIATIONS

Glossary

Abstraction	The removal of water from any source, either permanently or temporarily.
Abstraction Licence	A statutory document issued by the Agency to permit removal of water from a source of supply. It is usual for both daily and annual limits to be set.
Agenda 21	A comprehensive programme of global action to achieve a more sustainable pattern of development for the next century. The UK Government adopted the declaration at the UN Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992.
Algal blooms	Rapid growth of phytoplankton in marine and/or fresh waters, which may colour the water and may accumulate on the surface as a green scum. Decomposing cells consume large quantities of oxygen in the water, which may result in the water becoming anaerobic. Some blooms (such as certain species of blue-green algae) may also be toxic.
Alluvial	Sedimentary deposits resulting from the action of rivers. Typically composed of fine-grained material (e.g. silt) carried by the river and deposited in areas such as floodplains.
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.
Aquifer	A water bearing-stratum situated below ground level. The water contained in aquifers is known as groundwater.
Biochemical Oxygen Demand (BOD)	A standard test which measures over 5 days the amount of oxygen taken up by aerobic bacteria to oxidise organic (and some inorganic) matter.
Biodiversity	Diversity of biological life; the number of species present.
Biomass	Total quantity or weight of organisms in a given area or volume - eg, fish biomass is measured as grams per square metre (g/m^2).
Borehole	Well sunk into water-bearing rocks.
Boulder Clay	Rock-type deposited under glaciers as they move. It consists typically of a mixture of rock fragments, clay, sand and gravel.
Brownfield Site	Old housing or industrial area currently unused but which could be redeveloped for housing and ancillary development.
Brundtland Report	Report of the 1987 World Commission on Environment and Development.
Catchment	An area of land which collects and drains the water which falls on it. It is usually composed of a single river system and its tributaries
Coarse Fish	Freshwater fish other than salmon and trout.
Controlled Waste	Industrial, household and commercial waste, as defined in UK legislation. Controlled wastes specifically excludes mine and quarry waste, wastes from premises used for agriculture, some sewage sludge and radioactive waste.
Controlled Waters	All rivers, canals, lakes, groundwater, estuaries and coastal waters to three nautical miles from the shore, including the bed and channel (which may be dry for periods of time).
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 the 'health' of the water. It is used to classify waters.

Drift	Transported superficial deposits, especially those transported by ice.
EC Directive	Legislation issued by the European Union that is binding on Member States in terms of the results to be achieved. It leaves to Member States the choice of methods.
EC Regulation	European Community legislation having legal force in all Member States.
Ecosystem	A functioning, interacting system composed of one or more living organisms and their natural environment, in biological, chemical and physical senses.
Effluent	Liquid waste from industry, agriculture or sewage treatment plants.
Environmentally Sensitive Area (ESA)	An area where traditional farming methods may be supported by grant aid from support distinctive landscape, wildlife habitats or historic features.
Eutrophic	A description of water which is rich in dissolved organic and mineral nutrients. At worst, such waters are sometimes beset with unsightly growths of algae.
Fish Biomass	A measure of the quality of a fishery as found in terms of surveys. It is measured as mass per area (g/m^2).
Floodplain	This includes all land adjacent to a watercourse over which water flows or would flow but for flood defences in times of flood.
General Quality Assessment (GQA)	A new scheme replacing the National Water Council Classification system. It provides a means of assessing and reporting environmental water quality in a nationally consistent and objective way. The chemical grades for rivers introduced in 1994 uses BOD, Ammonia and Dissolved Oxygen limits for water quality between A (Very Good) and F (Bad). Other grades for estuarine and coastal waters are being developed and aesthetic components will be measured and graded by a system under trial at present.
Global warming	An increase in the average temperature of the Earth, thought to be caused largely by the build-up of greenhouse gases such as carbon dioxide in the atmosphere.
Habitat	The customary and characteristic dwelling place of a species or community.
HABSCORE	Habitat Score. A system for measuring and evaluating habitat features for salmon and trout. A statistical model relating to habitat variation allows outputs such as expected fish population and habitat utilisation to be produced.
Hydrology	The study of water on and below the Earth's surface.
In-river needs	The totality of requirements for the water environment and effluent dilution before abstraction is taken into account.
Integrated Pollution Control (IPC)	An approach to pollution control in the UK that recognises the need to look at the environment as a whole, so that solutions to particular pollution problems take account of potential effects upon all environmental media.
Internal Drainage Boards (IDBs)	Authorities responsible for dealing with land drainage within a district. They are primarily concerned with agricultural land drainage but also may be involved with water supply to their district for agricultural purposes.
Leachate	Liquor formed by the act of leaching.
Main River	The watercourse shown on the statutory 'Main River Maps' held by the Agency and MAFF. The Agency has permissive powers to carry out works of maintenance and improvement on these rivers.
Nutrient	Substance providing nourishment for plants and animals such as nitrogen, phosphorus and potassium.
Office of Water Supply	Regulator of Water Supply Companies.

Permissive Powers	Powers which confer on the Agency the right (but not the duty) to do things
Potable Water	Water of a suitable quality for drinking.
Public Water Supply (PWS)	The supply of water by companies appointed as Water Undertakers by the Secretary of State for the Environment under the Water Industry Act 1991.
Return Period	Refers to the frequency of a rainfall or flooding event. Flood events are described in terms of the frequency at which, on average, a certain severity of flow is exceeded. This frequency is usually expressed as a return period in years: a 1 in 50 year flood event would be expected to occur, on average, once every 50 years.
Riparian (Owner)	Owner of riverbank and/or land adjacent to a river. Normally owns riverbed and rights to mid-line of channel.
River Corridor	The continuous area of river, river banks and immediately adjacent land alongside a river and its tributaries.
Scheduled Monument	The key sites nationally for archaeology, designated by the Secretary of State for National Heritage, through English Heritage.
Septic tank	A tank used for the treatment of sewage from properties without mains drainage. The sewage is settled and some bacterial treatment occurs. Discharge of effluent is usually to a soakaway system.
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	System of sewers usually used to transport sewage to a sewage treatment works.
Siltation	Action of depositing silt at the bottom of a river or lake. A deposit of clays and silts can be difficult to remove naturally as it requires turbulent flow and high velocities.
Site of Special Scientific Interest (SSSI)	A site designated under the Wildlife and Countryside Act 1981 by English Nature or the Countryside Commission for Wales as a result of its nature conservation or geological value.
Sludge	The accumulation of solids from treatment processes. Sludge can be incinerated or spread on farmland.
(candidate) Special Area of Conservation (cSAC)	Sites designated under the EU Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (92/43/EEC). These sites are designed to protect important wildlife habitats or threatened species.
Special Protection Area (SPA)	Sites designated under the EU Directive on the Conservation of Wild Birds (79/409/EEC). These sites are designated to protect specified rare or migratory bird species.
Spray Irrigation	The watering of crops by spraying, which can have high evaporative losses when compared with trickle irrigation or use of sluices.
Statutory Consultee	In both the Agency's and other agencies' legislation there are requirements for consultation. Comments and objections that are received are noted but do not usually have the power, in themselves, to prevent the controlling authority from making a decision.
Strata	A term applied to rocks that form layers or beds. Can also be applied to successive layers of any deposited substance such as the atmosphere, or biological tissue.
Structure Plans	Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.
Surface Water	Water collecting on and running off the surface of the ground.

Sustainable Development	'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland definition).
S105 Surveys	Section 105 of the Water Resources Act 1991 allows for Standards of Service, Assets and Flood Risk Surveys.
Watercourse	A stream, river, canal or channel along which water flows.
Water Quality Objectives (WQO)	Water quality targets to secure specific formal minimum quality standards for specific stretches of water by given dates. A new component of these is introduced by 'The Surface Waters (River Ecosystem Classification) Regulations 1994', a classification scheme to be applied by Agency to the rivers and watercourses of England and Wales. Other existing standards operate already to give effect to various EC Directives for water quality.
Water Resource	The naturally replenished flow of recharge of water in rivers or aquifers.
Wetland	An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.
1:10 Year Drought/Flood	A drought/flood event with a statistical probability of occurring once in a ten year period (other periods may be specified in a similar way).

Abbreviations – Acronyms

AEG	Area Environment Group
(A)OD	(Above) Ordnance Datum
AWS(L)	Anglian Water Services (Ltd)
BATNEEC	Best Available Techniques Not Entailing Excessive Costs
BC	Borough Council
BOD	Biochemical Oxygen Demand
BPEO	Best Practicable Environmental Option
CAMS	Catchment Abstraction Management Strategy
CC	County Council
CMP	Catchment Management Plans
DC	District Council
DETR	Department of the Environment, Transport and the Regions
DO	Dissolved Oxygen
EPA90	Environmental Protection Act 1990
EQS	Environmental Quality Standard
gm^2	Grams per square metre (a unit of biomass)
GOBA	Great Ouse Boating Association
GQA	General Quality Assessment
IDB	Internal Drainage Board
IPC	Integrated Pollution Control
IPPC	integrated Pollution Prevention Control
KL&WNBC	King's Lynn and West Norfolk Borough Council
LEAPs	Local Environment Agency Plan(s)
LPA	Local Planning Authority
m	Metre
mg/l	Milligrams per litre
MAFF	The Ministry of Agriculture, Fisheries and Food
MLC	Middle Level Commissioners
MLS	Middle Level System
mm	Millimetre
NRA	National Rivers Authority
OFWAT	Office of Water Services
REC	River Ecosystem Class
RSPB	Royal Society for the Protection of Birds
(c)SAC	(Candidate) Special Area of Conservation
SM	Scheduled Monument
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
STW	Sewage Treatment Works
WLMP	Water Level Management Plan

APPENDIX D: AEG SUB-GROUP, STAKEHOLDER GROUP AND PROJECT TEAM MEMBERSHIP

Representatives of the Great Ouse Area Environment Group (AEG)

Geoff Cave
Brian Charlesworth
Colin Clare
Ingrid Floering Blackman
John Gilbert
David Jones
Gary Mortimer

Project Team

Nigel Woonton	Area Flood Defence Manager & Project Executive
Adam Nicholls	LEAPs Officer & Project Co-ordinator
Mike Atkinson	Senior Fisheries Assistant
Jeff Harrison	Flood Defence Engineer
Pauline Jones	Tactical Planning Officer
Helen McCaffery	Environment Protection Officer
Alison Whitehead	Resource Planning Officer
Patrick Duffy	Development Control Officer

Stakeholder Group Members

Mr H Birkbeck	Westacre Estate (Farming)
Mr J Gilbert	National Farmers' Union
Mr B Charlesworth	Country Landowners' Association
Mr A Tinsley	Salmon and Trout Association
Mr K Allen	King's Lynn Angling Association
Mrs I Floering Blackman	Norfolk County Councillor
Mr J Clarke	Principal Planner, King's Lynn and West Norfolk Borough Council
Mr R Wade	Environmental Health Officer, King's Lynn and West Norfolk Borough Council
Mr D Mills	Rights of Way Officer, Norfolk County Council
Mr P Fisher	Royal Society for the Protection of Birds (RSPB)
Mr P Doktor	Norfolk Wildlife Trust
Mr D Phillips	East of the Ouse, Polver and Nar Internal Drainage Board (IDB)
Ms H Mahon	King's Lynn Consortium of IDBs
Capt J Lorking	Harbour Master, King's Lynn Conservancy Board
Mr R Hirst	Anti Waste
Mr G Mortimer	Anglian Water Services
Mr D Gurney	Norfolk Landscape Archaeology
Mr M Atkinson	Environment Agency
Mr C Clare	Chairman, Great Ouse Area Environment Group

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.

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

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