

Box 4

local environment agency plan

ARUN AND WESTERN STREAMS LEAP CONSULTATION DRAFT OCTOBER 1999



ENVIRONMENT
AGENCY

Arun and Western Streams Key Details

General

Area	1484.02 km ²
Coastline	142.5 km

Administrative Details

Local Authorities: % of Area	
West Sussex County Council	86.8%
Surrey County Council	7.9%
Hampshire County Council	5.3%

Population

Year	Population
1991	480000
2001 (Estimate)	520000

Water Resources

Average Annual Rainfall 862 mm/yr

Number of licensed abstractions	
Surface Water	138
Groundwater	226
Combined	6

Water Companies

SEW
SWS Sussex
Portsmouth Water
Thames Water
East Surrey

Conservation

Sites of Special Scientific Interest	63
Special Areas of Conservation	9
Special Protection Areas	2
National Nature Reserves	2
Areas of Outstanding Natural Beauty	6

Fisheries

Length of EC Designated Fisheries (km):	
Cyprinid	73.87
Salmonid	57.55

Water Quality

River ecosystem classification as % of the catchment between 1995 and 1997

Class	
RE1	1
RE2	12
RE3	17
RE4	9
RE5	3
Total	42

Number of EC Designated Bathing Waters 10

Pollution Prevention & Control

Landfill Sites (Inert)	11
Landfill Sites (Biodegradable)	3
Waste Treatment/Processing Plants	5
Metal Recycling Stations	18
Incinerators	0
Transfer Stations	20

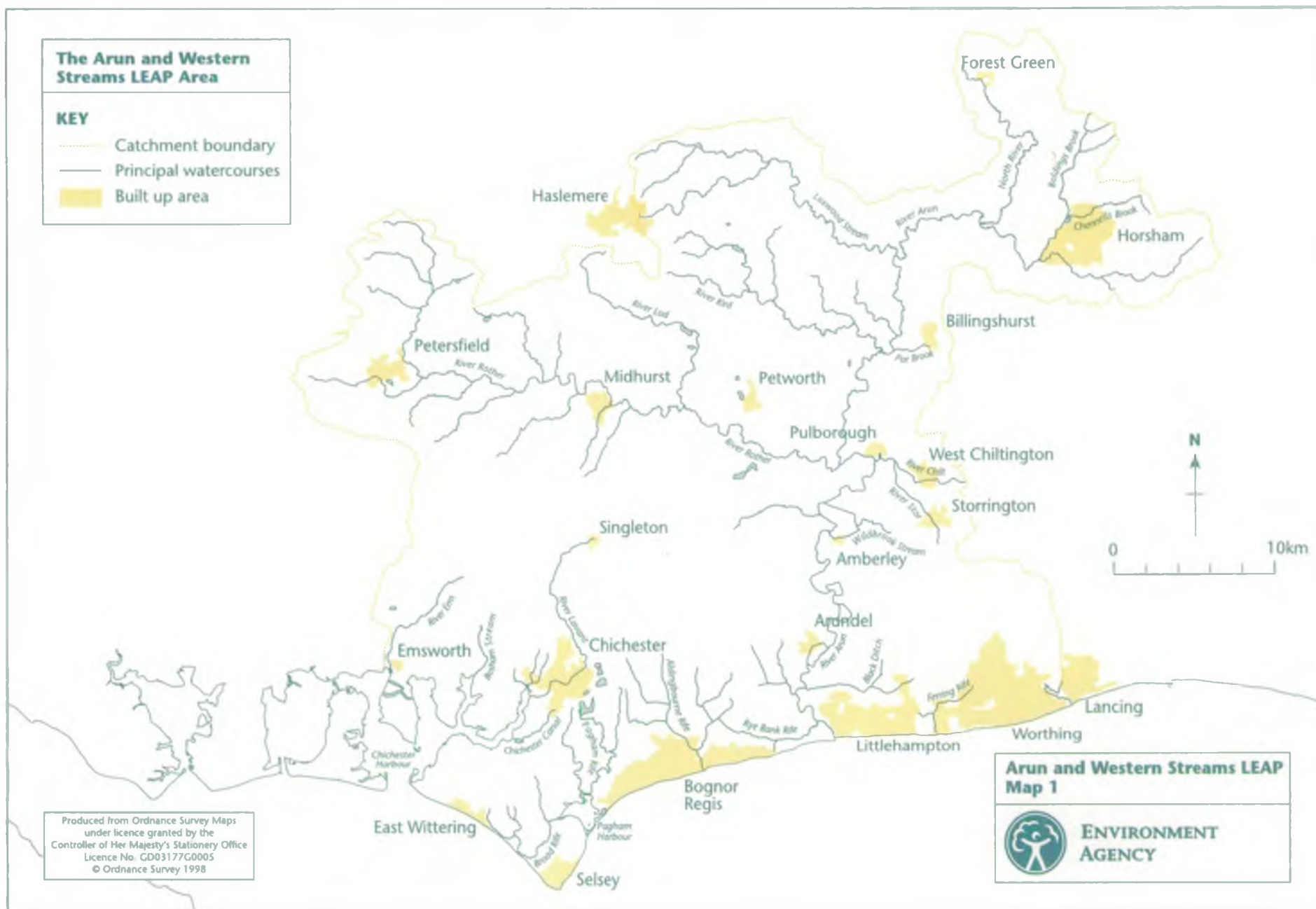
Integrated Pollution Control Authorisations

Discharge to Air	4
Effluent Discharges	3

Flood Defence

	Length (km)
Coastline including main tidal waters	142.5
Main River including tidal lengths	408.27
Sea Defences Agency responsibility	18.81

Catchment Overview



YOUR VIEWS

The Environment Agency welcomes your views on the future management of the area.

What do you think?

- Have all the important environmental issues been identified?
- Have all the potential options and solutions to issues been identified?
- Is the vision for the area your vision?
- Do you have any other information or ideas you would like to share?
- In what way can you or your organisation work in partnership with the Agency to improve the Arun and Western Streams catchment.

This Consultation Draft is about the Arun and Western Streams catchment Area. It is the Agency's first appraisal of the status of the environment in this area and we hope this report will be read by everyone who has an interest in the quality of the environment. Your views will help us develop a Final plan, which will turn options for action into actions that will make a difference.

COMMENTS ARE REQUIRED BY 28 JANUARY 2000

Please send your written comments to:

The Customer Services Manager,
Environment Agency,
Sussex Area Office,
Saxon House,
Little High Street,
Worthing
West Sussex BN11 1DH
Tel: 01903 215835
Fax: 01903 215884

Privacy Note

Response to this consultation is purely voluntary. The content of all responses will be used by the Agency to assist it in carrying out its statutory duties and the general details will be made public (this includes informing the applicant). Unless you specifically request otherwise or indicate that your response is confidential, we will make public (and provide to the applicant) your name and address and a general summary of your comments in response to this consultation. If you have no objection to or would prefer the full content of your response being made public and copied freely please indicate this in your response.

Your right of access to the information held and right to apply for rectification of the information are as prescribed in current data protection legislation.

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 an unique opportunity to look at our environment in an integrated way.

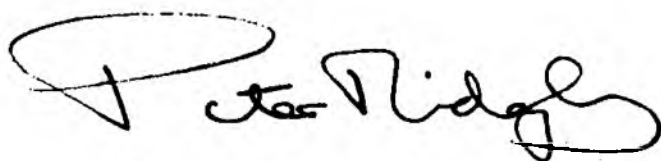
Local Environment Agency Plans (LEAPs) provide a means for the Agency to identify local environmental concerns and pressures and set priorities to solve problems to protect and improve the environment in a co-ordinated way. In producing this document our primary aim has been to identify the environmental issues and concerns in the Plan area, taking into account comments received through external consultation and advice given by the Sussex Area Environment Group (AEG). This committee comprises local people, local authority members and environmental and industrial representatives who advise upon our operations in Sussex.

The opportunity has also been taken to use the Plan to provide information about the Agency's activities. We hope that this will help everyone to comment on the issues and actions put forward and to highlight other issues which we may not have identified.

On completion of the Consultation period, the issues and actions identified together with the comments received will enable the Agency to assess the relative priorities for future actions in the Plan area. Such actions will be identified in the final plan and these will be forwarded into the Sussex Area's Business Plan. Hence, in responding to the Consultation Draft, all participants can influence the priorities and hence expenditure of the Agency.

It is hoped that this LEAP will help to provide a focus for everyone interested in the environment to undertake and achieve environmental improvements in a sustainable manner. It will, together with other plans for the Sussex Area, represent a shared vision for the future and play an important role in the protection of our environment, whilst recognising the ever competing pressures on the environment and the need to balance cost and benefit.

I would thank you for the time spent studying this plan and welcome any comments you may wish to make.



Peter Midgley
Sussex Area Manager

ENVIRONMENT AGENCY



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THE ENVIRONMENT AGENCY

OUR VISION AND AIMS

Our Vision:

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 resource, animals and plants
- to make the most of pollution control and river-basin management
- to provide effective defence and warning systems to protect people and property against flooding from rivers and the sea
- to reduce the amount of waste by encouraging people to re-use and recycle their waste
- to improve standards of waste disposal
- to manage water resources to achieve the proper balance between the country's needs and the environment
- to work with other organisations to reclaim contaminated land
- to improve and develop freshwater fisheries
- to conserve and improve river navigation
- to tell people about environmental issues by educating and informing
- to set priorities and work out solutions that society can afford

We will do this by:

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

VISION FOR THE ARUN AND WESTERN STREAMS AREA

The Arun and Western Streams LEAP area is characterised by important landscape and wildlife areas. We want to capitalise on these assets and through our own operations, and in partnership with others, endeavour to conserve and enhance the natural environment. In particular, opportunities to restore natural rivers and wetlands altered and sometimes lost to past engineering works and urbanisation will be forwarded where feasible.

Flooding issues have a very high profile in the area. The risk of flooding from the sea, for example on the Selsey/Medmerry frontage, and the risk of flooding to Chichester from the River Lavant are two local concerns. We will undertake works to increase the protection of people and property from flooding. In particular, the River Lavant Flood Alleviation Scheme will be taken forward to improve the protection to Chichester and the continued maintenance and improvement of sea defences will be a priority to provide effective protection from flooding from the sea. There will however, always be a risk of flooding and hence we will continue to improve our flood warning service for people in flood risk areas.

The extent of new development in the LEAP area is a major local concern. The Agency will continue to liaise with local authorities to identify environmental pressures from new development and work with them to not only minimise the impacts of development, but also to forward opportunities for environmental enhancements.

Education initiatives will be forwarded as the key to changing the actions of individuals and industry. Working with industry, hospitals and schools will ensure a proactive approach to implementing environmental initiatives. Individuals, however, must also be made aware of the significant role each person has to play in protecting the environment. By our own actions we can, either at home or work, make a difference by preserving natural resources, saving energy and recycling waste.

We all want a better environment for ourselves and our children. In this LEAP we aim to manage our activities and duties to address local concerns and achieve environmental enhancement in a manner which is sustainable.

The Agency's vision for the area cannot, however, be achieved alone. We will therefore initiate and progress opportunities for partnerships with others and seek, where possible, external funding to achieve environmental initiatives. Together we can make the difference.

CONSULTATION DRAFT

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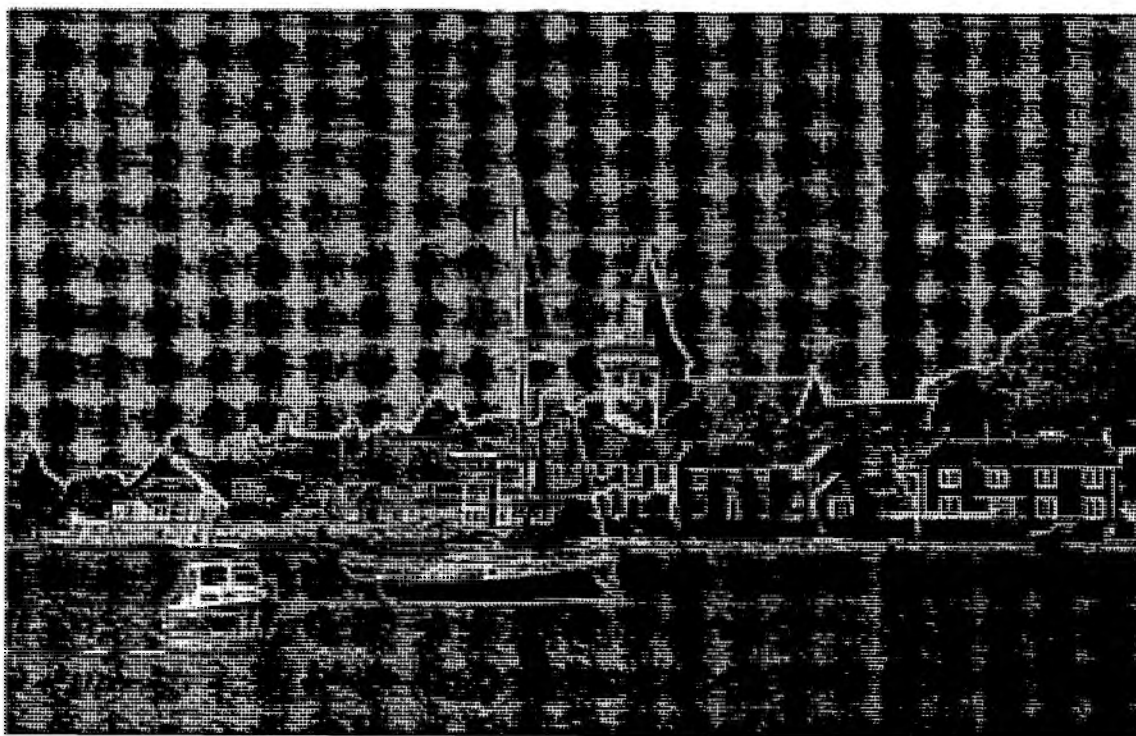
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1.0 THE ENVIRONMENT AGENCY

Background

- 1.1 The Environment Agency has a wide range of duties and powers relating to different aspects of environmental management. These duties, together with those areas where the Agency has an interest but no powers are described in more detail in Appendix 1. The Agency is 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.*"

1.2

The Principal Aim of the Environment Agency

"... is to protect and enhance the environment, taken as a whole, so as to make a positive contribution towards achieving sustainable development..."

Environment Act 1995

- 1.3 At the heart of sustainable development is the integration of human needs and the environment within which we live. Indeed the creation of the Agency itself was in part a recognition of the need to take a more integrated and longer-term view of environmental management at a national level. We therefore have to reflect this in the way we work and in the decisions we make.
- 1.4 Taking a long-term perspective will require the Agency to anticipate risks and encourage precaution, particularly where impacts on the environment may have long-term effects, or when the effects are not reversible. The Agency must also develop its role to educate and inform society as a whole, as well as carrying out its prevention and enforcement activities, in order to ensure continuing protection and enhancement of the environment.
- 1.5 Although the Agency only has duties and powers to protect some environmental resources, it will need to contribute to other aspects of environmental management even if these are, in the first instance, the responsibility of others. The Agency can only do this effectively by working in partnership with and through others in order to set common goals and to achieve agreed objectives.
- 1.6 The Agency also has to work in a wider international context because it is now generally accepted that environmental changes are occurring on a global scale. Individual countries contribute to these changes, and respond to them, in different ways. The Agency's long-term strategy therefore has to reflect these global issues, and it has to be delivered within the framework of international and national commitments which has been developed to address them.
- 1.7 Perhaps the major international issue is that of climate change. The UK is a contributor to the emission of gases such as carbon dioxide into the atmosphere which are believed to contribute to long-term climate changes. The UK will also be affected in a complex way as and when the climate does change. It is therefore a signatory to the Framework Convention on Climate Change, as agreed at the Rio Summit in 1992, and subsequent agreements at the Kyoto Summit in 1997. It is taking an active part in international negotiations to obtain commitments beyond the year 2000 for credible, effective, and achievable reductions of greenhouse gas emissions.
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- 1.8 One of the key outcomes of the United Nations "Earth Summit" held in Rio de Janeiro in 1992 was agreement by governments that, in order to solve global environmental problems, local action is crucial. We must all therefore think globally but act locally. The Local Agenda 21 initiative set out actions needed to achieve sustainable development, including the need to make clear the links which exist between local life-styles and the use of resources.
- 1.9 In the UK plans have now been formulated by local government and local communities to identify and address a wide range of environmental issues including natural resource use, pollution, health, local amenity and quality of life. These programmes set out long-term solutions that take account of global implications, such as the use of resources that affect the global environment and thus local communities in other parts of the world.
- 1.10 Against this background the Agency has drawn up an Environmental Strategy to deal with the major problems by an integrated approach to the management of the whole environment. This approach has led to the identification of nine environmental themes which will be used for the Agency's planning processes:

- Addressing the causes and effects of climate change
- Helping to improve air quality
- Managing our water resources
- Enhancing biodiversity
- Managing our freshwater fisheries
- Delivering integrated river-basin management
- Conserving the land
- Managing waste
- Regulating major industries effectively



In the Consultation Draft we have identified up to 3 key environmental themes for each Action.

When to Contact Us

- 1.11 The Agency has a duty to protect and improve the environment as a whole, not only through its operational and regulatory roles, but also in the general advice we give to the public. The following table describes in detail proposals for development, works and usage where prior consultation with us is advised as formal statutory consents/licences may be required from the Agency prior to any works commencing.

Table 1: Proposals where Prior Consultation with the Agency is Necessary/Advised

Proposal	Reason
Works within or adjacent to any watercourse including outfalls, weirs, piping, ponds, diversions, infilling, bridges and planting.	Ensure flooding is not exacerbated, access to and along watercourses is retained, and water quality, conservation, recreation and fisheries are protected.
Works in areas at risk to flooding from rivers and the sea , including development and land raising/infilling.	Ensure flooding is not exacerbated, access to and along watercourses is retained, and water quality, conservation, recreation and fisheries are protected.
Works on, under or adjacent to any floodbank, sea defence or other flood control structure.	Ensure integrity of flood defences is retained and flood risk is not exacerbated.
Works on aquatic/wetland sites	Ensure flooding is not exacerbated, protection of water quality and wildlife
Works on contaminated or potentially contaminated land , e.g. former landfill, gas works, industrial use, fuel/chemical storage or production or close to a landfill site or major industrial process.	Address pollution, waste disposal and gas permeation concerns.
Development involving the disposal of foul sewage other than to public foul sewer including the use of septic tanks, cesspits, private sewers and private sewage treatment plans.	Protect environment from pollution.
Development greater than half a hectare in area.	Ensure increased surface water run-off from development does not exacerbate flooding.
Use, storage, transfer or disposal of radioactive material.	Control and monitoring of radioactive material to ensure the protection of public health.
Waste Management operations , including movement of waste, landfill, waste transfer stations, incinerators, scrapyards, recycling plants.	Ensure effective disposal of waste with no unacceptable risk of pollution and harm to public health.
Commercial and industrial development.	Ensure no unacceptable risk of pollution and increased flood risk, and effective waste disposal.
Agricultural operations including livestock and poultry units, chemical and fertiliser storage, silage making/storage and disposal of manure.	Promote effective disposal of waste and farming practices and ensure no unacceptable risk of pollution.
Works involving fisheries including fishing licences, fish stocking, fish farming and fish transport.	Protect health of fish population within the natural environment and ensure no increased risk of pollution to water.
Ponds, lakes and reservoirs.	Protect stream flows, ensure flooding is not exacerbated and fish movement is not obstructed. Protect and enhance wildlife and ensure waste disposal and pollution implications are addressed.

Proposal	Reason
Works within areas of environmental and archaeological designation.	Protection of species, habitats and archaeological features
Abstraction of water from surface water or groundwater sources.	Protection of water resources, natural environment and existing water users.
Works incorporating any infill or excavation operation.	Ensure the protection of environment from pollution and address waste disposal and flooding concerns.

- 1.12 The following table lists the the Agency's principal legislation and requirements for licences and consents at the time of writing this report::

Table 2: The Agency's principal legislation and requirements for licences and consents:

Enactment	Consent/Licence Required from the Agency
Environment Act 1995:	Drought Permits.
Water Resources Act 1991:	Impoundment of any water on line of a watercourse. Abstraction of water from underground or surface waters. Discharge of effluent into underground, surface, estuarial and coastal waters. Any works in, over or under a "main river". Use of an instrument other than a rod and line to remove fish.
Land Drainage Act 1991:	Culverting, obstructing, diverting or infilling any watercourse.
Land Drainage and Sea Defence Bylaws:	Works in or adjacent to (distance on relevant Bylaw) any classified* watercourse or sea defence.
Salmon and Freshwater Fisheries Act 1975:	Movement or introduction of fish or fish spawn to an inland watercourse, lake, etc. Rod and line fishing.
Environmental Protection Act 1990:	Treating, keeping, depositing or disposing of any controlled waste on land. Transport of (hazardous) waste. Use of more than 50 tonnes of packing material in any one year. Control of any process prescribed under Schedule 1 of Statutory Instrument (SI) 1991 No 472. Environmental Protection (Prescribed Processes and Substances) Regulations – as amended.
Radioactive Substances Act 1993:	Storage, use and disposal of radioactive material.
Control of Pollution (Amendment) Act 1989:	Transport of waste during the course of a business.
Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulation 1991	Silage making, slurry storage systems including yard washings, and storage of fuel oil in excess of 1500 litres.
<i>NB: Current legislation is often under review and new legislation often introduced. The Agency should be consulted to verify whether any licences or consents are required for any proposal.</i>	
<i>Note: Conservation and recreation will be taken into account when assessing any application.</i>	
<i>* Classified watercourses including "main rivers" are identified on Agency maps.</i>	

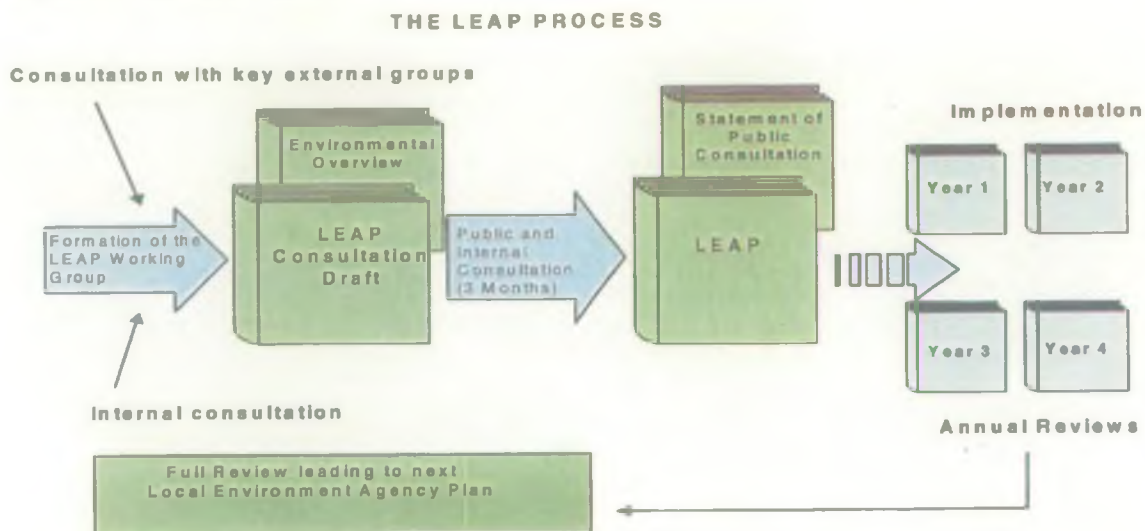
Local Environment Agency Plans (LEAPs)

- 1.13 We are committed to delivering environmental improvement at the local level, and our policy and Environmental Strategy will be translated into delivery on the ground through LEAPs. First and foremost LEAPs identify work the Agency needs to do in a local area in order to address local concerns and meet our statutory obligations in line with national targets. LEAPs are public documents subject to a wide consultation in their preparation and we believe that this process will build trust in the community by being open and frank when dealing with all issues.
- 1.14 In addition, we know that the Agency alone cannot bring about the achievement of national environmental goals and targets. Through LEAPs, therefore, we hope to identify and develop partnerships with Local Authorities, representatives of local communities, regulated organisations and other bodies with similar environmental objectives and responsibilities so as to make the most effective use of limited resources. In this context LEAPs will examine and promote the ways in which we in the Agency can co-ordinate our aims, objectives and actions in a locality, with those of others to best effect. Finally LEAPs will also be a practical source of data and guidance for all those who wish to become involved in local environmental management and improvement, notably Local Authorities and environment and community groups.
- 1.15 Each LEAP will take a long term view of local environments and set out a five year plan of action for solving local issues. Published Draft Consultation Reports will cover all parts of England and Wales, including the Southern Region of the Environment Agency, by the end of 1999. This is only the first milestone in what will be an ongoing national programme of LEAPs, which will be regularly updated, developed and improved.

The LEAP Process

- 1.16 We aim to establish a common vision for environmental objectives and a consensus on future tactics, actions and priorities. Participation and preliminary consultation has already taken place with our Sussex Area Environment Group (AEG) and key local organisations (Appendix 2) to produce this draft Plan and the Environmental Overview (available on CD Rom only). This Report is intended to be the means by which consultation can be extended as widely as possible.

Figure 1: The LEAP Process



The LEAP Consultation Draft

- 1.17 The LEAP Consultation Draft concentrates on the prioritisation of environmental issues relevant to the Environment Agency and the identification of possible options for action necessary to restore and improve the local environment. This document is the main focus for public consultation. The issues and options for action put forward to address those issues have been structured around the Agency's nine environmental themes, which aim to protect and enhance the environment in an integrated way and contribute towards sustainable development.
- 1.18 The Launch of this Consultation Draft marks the start of a three month period of formal consultation enabling external organisations and the general public to work with us in planning the future of the local environment.

This is the first output of the process and is not the Final Plan.

It gives you an opportunity to:

- highlight any issue/actions not already identified within the area
 - work towards establishing and implementing a five year action plan.
- 1.19 An Environmental Overview is produced as a separate document and is a factual description and analysis of the local environment, looking at the impact of stresses on its state, and generating a list of issues for consideration by the Agency and others. The Environmental Overview supports the Consultation Draft and provides the background to the issues.

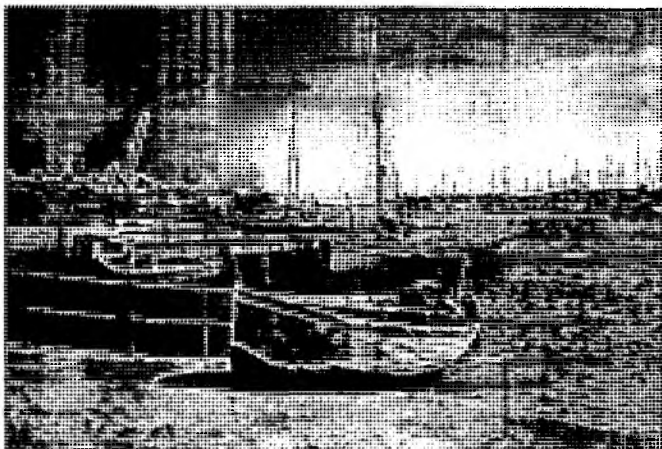
The Final Plan

- 1.20 The final LEAP Plan will summarise and take into account the results of consultation and will contain a list of prioritised actions that take account of costs and benefits, identifying timescales and partner organisations. Agreed actions will be incorporated into the Agency's annual Business Plan.

The Annual Review

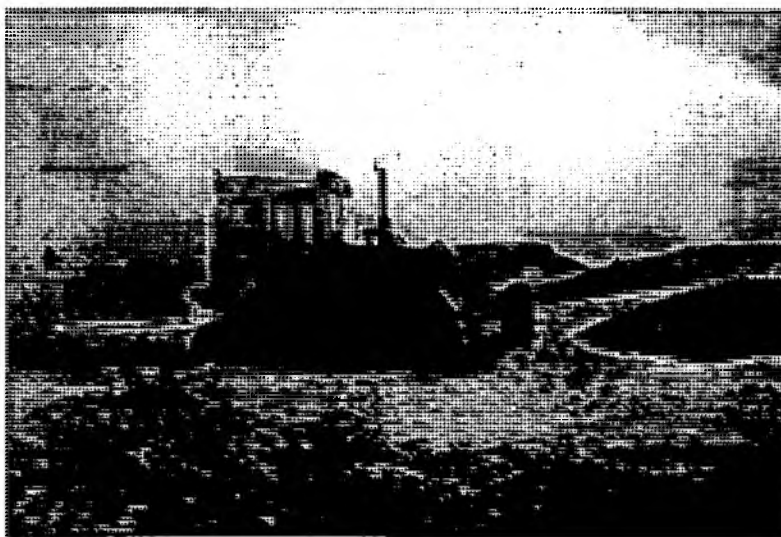
- 1.21 The Agency will monitor implementation of the LEAP and report on progress in a published Annual Review. The Annual Review will also identify any additional actions needed to maintain progress in the light of any changes in the LEAP area and also whether any actions need removing or amending where they are no longer appropriate. After five years, or sooner if required, the Agency will carry out a major review of the progress that has been made. At this stage the Agency will produce a new LEAP Consultation Draft to reflect these changes to further improve the local environment.

2.0 THE ARUN AND WESTERN STREAMS CATCHMENT

- 2.1 This LEAP considers the catchment of the River Arun and its main tributary, the Western Rother, the West Sussex coastal streams, including the River Ems and River Lavant and Chichester and Pagham Harbours. In total the area comprises the south western quadrant of the Weald with its impermeable Clays and Sandstone hills, the Sussex Chalk downland west of the Adur gap and the coastal plain from Lancing to the Hampshire boundary. The area extends into Hampshire at its western extremity and straddles the West Sussex/Surrey and West Sussex/East Sussex boundaries on its northern and north/eastern extremities respectively. The catchment includes the whole areas of the Councils of Chichester District, Arun District and Worthing Borough, the majority of Horsham District and parts of Waverley District, Mole Valley District, Adur District, East Hampshire District and Havant Borough.
- 2.2 The area is characterised by a high concentration of urban development along much of the coast, including the larger towns of Worthing, Littlehampton, Bognor Regis and the City of Chichester which lies in the south-west of the catchment. Inland, the area is principally rural and agricultural with a number of small and medium sized towns, namely Arundel, Billingshurst, Horsham, Midhurst and Petersfield and scattered smaller villages. A large proportion of the rural area is included in both the nationally designated High Weald and Sussex Downs Areas of Outstanding Natural Beauty (AONB) and the South Downs Environmentally Sensitive Area (ESA). Much of the remaining rural area is covered by statutory and non-statutory landscape designations. The area also possesses a wealth of local, nationally and internationally designated areas of ecological importance, principally related to coastal and chalk grassland features. Settled for thousands of years, the catchment has a rich built heritage and a wealth of designated areas of archaeological importance.
- 2.3 The coastal plain has been cultivated for more than two thousand years and many modern settlements can be traced back to pre-Roman times. Chichester (Noviomagus) was the capital of a Celtic kingdom and a Roman seat of government. There is a large Roman villa at Bignor, a Roman palace at Fishbourne and the area is also rich in more recent historic monuments. The coastline of the catchment is low-lying and in places has been eroded by several kilometres over the last two thousand years. Urban development covers more than 70% of the coastal frontage, the highest proportion in the UK and is protected against tidal erosion and flooding by sea defence embankments/walls maintained by the Agency or Maritime Local Authorities.
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- 2.4 Most of the coastal settlements developed because of the holiday trade and the majority of the approximately half a million people within the catchment live in this coastal area. Worthing is the largest town in West Sussex with a population of around 100,000 and enjoys comparatively mild winters with high sunshine hours per year. According to Air Ministry statistics the average winter sunshine in this area has for many years been the highest on the mainland. Littlehampton is the only port in the catchment and has a history of channel clearance and widening to enhance commercial trade. The Littlehampton Harbour Board has been instrumental in promoting the port.

- 2.5 The history of the upper reaches of the River Arun is tied up with the exploitation of the iron deposits of the area. The importance of the streams to the Wealden iron industry is evidenced by hammer ponds, where ironstone from the Weald was first exploited in the Iron Age and then by the Romans through to the Middle Ages. The River Arun has a history of navigation with the Wey and Arun canal being built alongside the river north of Pallingham in the 18th Century. There is generally limited industry in the area and most employment is associated with agriculture and tourism/recreation.
- 2.6 The Agency sets standards for sewage and wastewater effluent discharges to ensure water quality in designated bathing waters complies with EU Bathing Water Directive standards. In 1998 West Wittering, Bracklesham Bay, Selsey, Pagham and Littlehampton complied with EU guideline standards, which are standards above the statutory standards, whilst Bognor Regis, Middleton-on-Sea, Worthing and South Lancing passed the statutory mandatory standards only and Felpham failed to achieve the mandatory standards.
- 2.7 The River Arun rises east of Horsham with tributaries from the Greensand hills to the north and west. Downstream of the tidal limit at Pallingham, the Lower Arun is joined at Hardham by the Western Rother which rises from Chalk springs north-west of Petersfield, draining the scarp slope of the South Downs and the Greensand hills eastwards to Stopham. Owing to the low lying nature of the coastal plain, the tidal limit of the River Arun is 40km (25 miles) from its outfall to the English Channel at Littlehampton and the estuary is subject to strong tidal currents. From Arundel the estuary flows for 10km (6 miles) through a wide valley cutting through the Chalk South Downs, following the silted course of an Ice Age river.
- 2.8 The coastal plain is drained by small streams which rise on the Chalk, many of them winterbournes, the most notable being the River Lavant which flows through Chichester. Despite often being dry for much of the year, the Lavant has a history of flooding, the most recent being in January 1994. West of Bognor Regis the coastal plain broadens to become the Manhood Peninsula with Selsey Bill at its tip; nowhere higher than 10m AOD, much of this area is below high tide level and at risk to flooding from the sea. Currently a scheme to alleviate the risk of flooding to Chichester is being progressed.

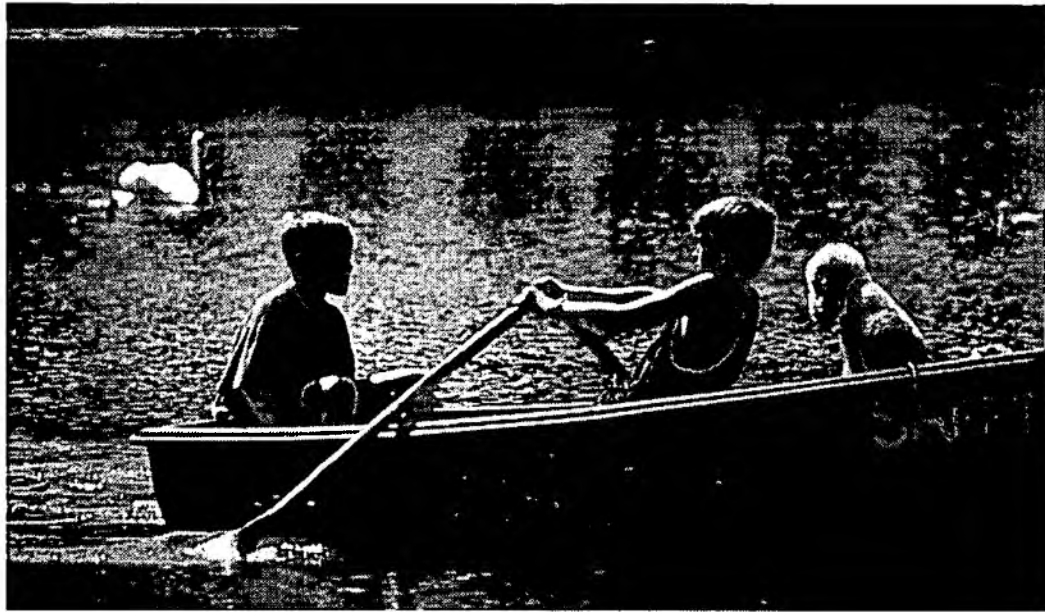
- 2.9 The protection of the coastal plain from flooding from the sea is one of the Agency's and local authorities' main objectives. Coastal strategies are being prepared to ensure the most sustainable and coordinated management of the coastline. The Medmerry frontage west of the Manhood Peninsula



is particularly liable to erosion and has breached on numerous occasions; the most recent being in January 1998. Careful consideration has to be given to development in areas at risk to flooding from the sea and generally development would be resisted along the undeveloped coastline. Pagham Harbour is a tidal inlet which was formerly reclaimed for agriculture, as were parts of Chichester Harbour which bounds the peninsula to the north.

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- 2.10 The Arun catchment has been heavily engineered in the lower reaches as a result of major drainage schemes to increase agricultural productivity. The Agency is responsible for 54 km of flood banks on the Arun between Littlehampton and Pulborough. Constructed originally to improve and protect agricultural land, opportunities now exist, given limited funds available for maintenance and improvement works and changing farming practices, to consider realigning flood embankments to provide new wetland habitats and more sustainable flood defences.
- 2.11 Chalk outcrops constitute an important groundwater resource and being hydraulically isolated by river valleys including the River Arun, the individual Chalk blocks can be managed as discrete units. At Hardham there is abstraction from the River Rother to provide water for Horsham and Crawley. (in the Agency's Thames Region). As treated effluent in Crawley is discharged to the River Mole which flows north to the River Thames, water supplied to Crawley is effectively lost from the Arun catchment. The extensive Lower Greensand aquifer which underlies the Hardham area is recharged naturally by rainfall and percolation from the river, and provides a backup resource which is managed conjunctively with the surface abstraction for public water supply. The optimisation of integrated river management to balance the needs of users is being addressed by the Agency.
- 2.12 Wildlife conservation features strongly in the area. Chichester and Pagham Harbours are noted internationally for their wintering birds, both sites being designated SSSI, SPA and Ramsar with Chichester Harbour having the additional designation of cSAC. The River Arun between Billingshurst and Pulborough supports a diverse dragonfly fauna which warrants its designation as a Site of Special Scientific Interest (SSSI). The Arun Valley, which includes the wetlands at Pulborough, Watham Brooks and Amberley Wildbrooks, is being considered for SPA status.
- 2.13 Water quality is generally good and the headwater streams support wild populations of brown trout. Sea trout migrate through the Arun estuary to their spawning grounds in the tributaries, especially the Chalk streams feeding the River Rother and are found in small streams flowing into Chichester Harbour. Elsewhere, ponds and streams support productive coarse fisheries which are extensively used by anglers. Suitable lakes have been developed commercially as "put and take" trout fisheries and a number of spring-fed sites are managed as fish farms, producing trout and coarse fish for restocking angling waters.
- 2.14 There are also pressures on existing waste management facilities from existing rates of disposal. At present, some 93% of wastes from the LEAP area is disposed of in landfill sites, the capacity of which is becoming limited to only a few years void space. In order to achieve sustainable waste management, levels of reuse and recycling need to be increased for industrial, commercial and household wastes and amounts of packaging reduced. The Agency is also promoting sustainable waste management practices through regulation, planning, local waste minimisation and recycling initiatives, data acquisition and influencing the market.
- 2.15 The Agency is the lead authority for the preparation of five Water Level Management Plans in the area: Amberley Wildbrooks is a priority site because of its high conservation importance and a WLMP has been produced and implemented for this area.
- 2.16 Recreation is a very important aspect in the catchment with often breathtaking views of the river valleys. The best known path is the South Downs Way, which is a National Trail running along the chalk ridge. The development of cycleways is important, including links with the national routes being promoted by Sustrans. The proposed Arun "*Coast to Countryside*" Project cycleway from Littlehampton to Arundel would link with
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the South Downs Way. Horseriding on bridleways is also popular, although generally not running alongside the river for any great distance.



- 2.17 Navigation rights on the River Arun are limited to the river's tidal reaches, with recreational boating upstream of tidal limits requiring the permission of the riparian owner. The Wey and Arun Canal Trust have restored sections of the canal and the Wey South Path traces as far as possible the former route of the navigation. A trip boat operates on one of the restored sections and accessible reaches of the towpath are popular with walkers. Similarly, the Chichester Canal Society together with other partners has been active in restoring the Chichester canal to its present state. The canal is currently used by the Society's trip boat, canoeists and rowers, whereas the four mile towpath is fully open and heavily used by walkers, cyclists and anglers. Yachting and canoeing are also popular offshore activities and towns such as Littlehampton and Bognor Regis offer sandy beaches for holidaymakers.
- 2.18 West Sussex has been placed under considerable pressure to accept large amounts of new housing development. The LEAP area is covered by the Regional Planning Guidance for the South East (RPG9), published in March 1994 and covering the period from 1991 to 2011. This guidance, which is currently under revision, recognises the need to work towards securing the objectives of sustainable development and aims to influence planning policies in Structure and Local Plans to secure the best development strategy for the region. West Sussex in its structure plan has resisted the extent of development pressure by arguing that the county has reached its environmental capacity. This, however, has not been accepted by government. Sites for new developments are being considered to the north of the area. This represents a shift away from the traditional growth in the coastal areas.
- 2.19 New development imposes pressures on the environment, but it can also offer opportunities for environmental enhancement. The Agency is proactively encouraging creative and sustainable water demand management techniques, including water-efficient devices and grey water reuse where appropriate creative design can forward such initiatives. Source control and sustainable surface water management to control runoff are also vital elements of sustainable development.

3.0 DEVELOPMENT PRESSURES

Land Use Planning: The Role of the Agency

- 3.1 It is widely acknowledged that the Town and Country Planning system has a key role in protecting the environment. The Agency supports Local Authorities and others, such as Regional Planning Conferences and Government offices, in developing land use planning policies to promote sustainable development and help secure the protection and enhancement of the environment. A high quality environment is crucial to achieving economic growth and regeneration and a better quality of life for local people. We comment on the appropriateness and scale of development in particular locations. Sustainable development does not mean, however, environmental protection at all costs. We believe achieving sustainable development involves finding ways to encourage environmentally compatible economic activity and discouraging or controlling environmentally damaging activities.
- 3.2 The Agency takes a proactive approach towards its involvement in the planning system and we consider this to be an integral part of our work to protect and enhance the environment. We are involved at all levels of the planning system. At a national level we liaise with DETR and other national organisations, and consult on new and revised legislation, Planning Policy Guidance and Circulars. At a regional level we liaise with Regional Government offices, and provide information and responses to Regional Planning Guidance. At the area level, the Agency promotes local liaison with county and district/borough councils with regard to development planning and development control..
- 3.3 The location, extent and design of development can influence the degree to which new development is sustainable. Whilst the Agency has powers to regulate some processes and substances which can impact on the environment, its powers to control development are limited. In considering impacts of new development, the Agency is therefore largely dependent on the planning system for the protection of the environment and for identifying opportunities for enhancements.

The Environment Agency and Forward Planning

- 3.4 The Environment Agency provides an integrated approach to the protection and enhancement of the environment. While we can influence some of the factors that have an impact on the well being of the environment, through our regulatory and operational activities, many are beyond our direct control. Land use change can have a significant impact on the environment.
- 3.5 The Town and Country planning system has a key role to play in protecting and enhancing the environment. Development plans set out the main considerations on which planning applications are decided. Policies and proposals contained within them are of primary importance for shaping land use change, and provide an opportunity to safeguard and enhance the environment and prevent future problems arising as a result of development.
- 3.6 The development plan process provides an important opportunity to progress towards sustainable development and growth. As a statutory consultee in the development plan preparation process the Agency recognises the importance of working with Local Planning Authorities (LPAs) to further the objective of contributing towards sustainable development.
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- 3.7 The basic objectives of the Agency in advising on Development Plan Policies and Guidance are to:

- promote policies which contribute towards sustainable development
- balance the demands of development with the need to protect and enhance the environment.
- prevent (or control) the pollution of air, land and water
- reduce the demand for water, making the best use of current resources
- reduce the risk to people, the developed and natural environment from flooding
- conserve and enhance biodiversity
- promote the use of water and associated land for recreational purposes
- achieve reductions in waste through minimisation, reuse and recycling and improved standards of disposal
- identify opportunities for environmental enhancement

- 3.8 When required, the Agency will appear at Examinations in Public and Local Plan Inquiries to support Local Planning Authority (LPA) policies which promote sustainable development and support our aims and objectives.

The Environment Agency and Development Control

- 3.9 LPAs are required under Town and Country Planning legislation to consult the Agency on certain planning applications and have discretionary powers regarding the referral of others. Once consulted the Agency assesses the implications of development on its interests and, where concerns are identified, advises the LPA to refuse the application or recommends conditions are imposed on any planning permission, to ensure that such concerns are addressed. Any objection would be supported at an Inquiry.
- 3.10 In assessing any planning application a detailed appraisal of the proposal is made by the Agency to identify any potential impacts upon the environment. The following in particular would be considered:

Potential Impacts of Proposed Development considered by Agency

- impact on flooding due to obstruction to watercourses, infilling of floodplains and impedance to groundwater flow
- implications for the integrity of watercourse channels and flood defences
- impact on groundwater quality particularly where the site lies in an sensitive area with respect to groundwater protection
- impact on surface water quality, including the washing of silt into a watercourse
- possible derogation to spring fed watercourses, wetlands and water abstraction
- impact on the conservation of the natural water environment including wetlands and river corridors
- flood risk to the new development from rivers and the sea
- impact of increased surface water runoff from new development on flooding elsewhere
- waste management implications including location to former landfill sites
- implications of development on possible contaminated land
- impact on sewage treatment facilities and sewerage systems

- 3.11 In assessing the potential impacts of proposed developments on the environment we will use the following principles:

Precautionary Principle: When the exact effect (or whether there is any effect) of a potentially harmful emission into the environment is not known, a presumption exists against its release.

Polluter Pays Principle: Polluters should bear the full cost of prevention and minimisation of pollution, and of remedying environmental damage. This cost should be reflected in the cost of goods and services which cause pollution in their production, consumption or disposal.

Proximity Principle: Potential environmental damage should be contained and rectified as far as possible as close to the source of production. The principle seeks to avoid further environmental damage as a result of remediation (eg contaminated land) or existing problems (eg transportation/disposal of wastes).

National Planning Liaison Guidance by the Environment Agency

- 3.12 In March 1997 we produced a Manual to assist Local Authority planners in their day to day contact with the Agency. The Manual identifies the background for the effective liaison between ourselves and LPAs. It lists the types of development plans and other strategies requiring Agency consultation for the following reasons:

- in order to influence policies and proposals which seek to protect and enhance the environment;
- to provide us with an awareness of wider issues which may affect or influence our own plans or actions.

- 3.13 The Guidance also details the types of planning applications we wish to be consulted upon, the relevance to the Agency of each type of application, and explains the requirement for each consultation - statutory or advisory. Appendices 3 and 4 provide summary information from this Manual.

Sustainable Development - the Challenge

- 3.14 While we all recognise the importance of achieving economic growth in West Sussex, it is crucial that such growth is not at the expense of the natural environment. If development does not proceed in a manner which balances the many social, economic and environmental demands, then the high environmental quality of West Sussex will be degraded and the area's ability to achieve economic prosperity reduced. The challenge is therefore to ensure that development proceeds in ways that are not only compatible with environmental protection, but also forward opportunities for environmental enhancement. This can be achieved by:



- forwarding initiatives to encourage the development of brownfield sites;
- locating new development to make effective use of existing or planned infrastructure and services;
- protecting and enhancing ecological value and biodiversity;
- maintaining and improving the quality of air, land and water through the control and prevention of pollution;
- protecting natural floodplains from development;
- forwarding sustainable urban drainage initiatives;
- promoting and forwarding sustainable waste management facilities;
- reducing waste generation, increasing the re-use and treatment of waste and minimising the disposal to land;
- forwarding water demand management efficiencies: leakage control, metering, water-saving devices and using greywater;
- restoring rivers and wetlands degraded by engineering and urbanisation and improving river corridors;
- protecting and improving landscape character, visual amenity and heritage;
- forwarding sustainable recreation facilities;
- educating/informing organisations and the public to increase environmental awareness.

4.0 A BETTER ENVIRONMENT THROUGH PARTNERSHIP

Introduction

- 4.1 Government recognised that it will require the active co-operation of all sections of society to achieve sustainable development.

"Because the environment is shared, collective action is necessary"

UK Strategy for Sustainable Development 1994

In the recent consultation paper on a revised UK Strategy, Government has confirmed that it is seeking to further encourage public participation in decision-making including involving local communities in identifying problems and opportunities for the environment.

- 4.2 Government guidance on the Agency's 'Contribution to Sustainable Development' specifically identifies the role of the Agency in building, supporting and developing partnerships, as a key means of delivering the Agency's objectives. The Agency, therefore, seeks to develop close and responsive relationships with the public, local authorities, business, industry, environmental and community groups. Partnership may be achieved through various arrangements such as funding, education, shared resources and information exchange. LEAPs offer opportunities for identifying and developing partnerships and monitoring achievements in the local environment.

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- 4.3 At the Earth Summit in Rio de Janeiro, 1992, it was agreed by Governments that action at a local level is crucial to help achieve sustainable development. Local Agenda 21 (LA21) is about local issues being resolved by local people, and is designed to promote the involvement and responsibility of us all. The concept of "*think global, act local*" is fundamental to the concept of LA21, but also perhaps the greatest challenge for implementation.
- 4.4 The need to more fully address the social element of the sustainable development agenda has stimulated more innovative and participatory approaches to both LA21 and the preparation of development plans. For example, West Sussex County Council is currently identifying choices and consequences with increased stakeholder involvement for continuous testing of development options. The district councils are also encouraging more community participation in development plan preparation, for example, with citizens' juries, community visioning and focus groups.
- 4.5 The Agency can contribute to these initiatives with targeted information and expert advice. This may be particularly useful when considering the consequences of choices. We are also keen to form partnerships with local authorities to prepare State of the Environment Reports (SOERs) which can form the basis for many studies with different applications.
- 4.6 Responsibility for the Local Agenda 21 process lies principally with district councils, who are required to create and co-ordinate partnerships between all sectors of the community and a framework within which local communities can discuss and reach consensus on the identification and resolution of environmental problems. The Government's aim is for all local authorities to have prepared a LA21 Strategy by the end of 1999. Issues raised by the LA21 process can include concerns, such as sustainable water resources, where the Agency is the key responsible organisation or others, such as air quality, where the Agency has a shared responsibility.

Local Partnership Initiatives

- 4.7 Local authorities often play a lead role in the promotion of partnership initiatives, through Agenda 21 and otherwise. A wide variety of partnership initiatives presently exist in the LEAP area, many combining economic, social and environmental objectives. Main themes include:
- encouraging sustainable waste management within industry and the local community through the development of waste minimisation, recycling and composting projects;
 - encouraging the use of more sustainable methods of transport, through promotion of environmental awareness of, for example, low pollution fuels and fuel efficient transport, and the development of community transport schemes;
 - encouraging energy and water conservation within industry and the local community;
 - encouraging sustainable land management practices and promoting the local farming economy with 'buy locally' campaigns;
 - use of specific campaigns, community newspapers, leaflets and exhibitions to provide information on sustainable living, ensure that all sections of the community are encouraged to participate in decision making, obtain feedback from the local community on what is important to them and provide information on progress towards sustainability.
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Strategic Links with other Statutory Organisations

- 4.8 At a strategic level, the Agency has already established collaborative arrangements with, for example, English Nature, local authority associations, National Park Authorities, and a number of organisations in respect of environmental research and development.

Involvement of the Agency in Local Partnership Initiatives

- 4.9 **Air Quality:** The Agency and local authorities share responsibility for air quality, and, for example, we are working together through the Sussex Air Quality Steering Group. Local authorities are responsible for producing and implementing Local Air Quality Management Plans, where necessary, and we are committed to assist them in this respect.
- 4.10 **Water Resources:** We are working with all the Water Companies in the south-east to prepare a sustainable strategy for water management over the next 30 years. We wish to work closely with local authorities, developers and the public to promote demand management options such as water saving devices, recycling and other creative design options.
- 4.11 **Biodiversity:** The Agency is working with English Nature, East Sussex County Council, West Sussex County Council, the Farming and Wildlife Advisory Group, RSPB, Sussex Wildlife Trust and others to maintain and enhance the natural resources in the area through the Sussex Biodiversity Action Plan, published in July 1998. We have also worked collaboratively with West Sussex County Council, East Sussex County Council, Sussex Wildlife Trust, English Nature and others in the development of the Biodiversity Records Centre and the Sussex Environmental Survey Directory. Further opportunities exist for partnership in interpreting survey information into management options and actions.
- 4.12 **Integrated River-Basin Management:** Collaborative projects are being undertaken for the Arun and Western Streams river valleys. In 1995 the Agency became a partner in the Arun Valley Project, its Project Officer being funded by the Agency. The Project aims to conserve and enhance the nature conservation, landscape and amenity value of the Arun Valley. From April 1999 the project has included the Rother to become the Arun and Rother Valley Project with a wider remit to include landscape conservation and historical land use in terms of archaeology. The Project is a partnership between the Agency, South Downs Conservation Board and English Nature.
- 4.13 **Freshwater Fisheries:** The Agency recognises a need to develop relationships and encourage partnerships with local Angling Clubs, Commercial fisheries and concerned parties.
- 4.14 **Land:** The Agency works closely with both local authorities and developers to help ensure that new development meets principles of sustainability.
- 4.15 **Waste:** The Agency is particularly interested to encourage partnership opportunities with local authorities, business and other groups to achieve waste minimisation. We are working collaboratively with the County, District and Borough Councils of West Sussex and industry to encourage waste minimisation across the County through the West Sussex Business Waste Reduction Programme.
- 4.16 The Agency also attends the following groups whose broad remit is to promote sustainable waste management: West Sussex Waste Management Liaison Forum, West Sussex Recycling Forum, Sussex Business Environment Forum, South East Regional Recycling Forum.
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4.17 **Education:** We recognise that broad-based education covering the community, educational and industrial sectors will result in a more informed society that is better able to understand the environment, its needs, and the impact of society's activities upon it. The Agency's Education Strategy *Green Shoots* includes the following objectives:

- help educate young people through teaching aids and other initiatives;
- educate industry and business through consultation, collaborative activities and targeted campaigns to promote pollution prevention rather than its remediation;
- raise public awareness of environmental issues to encourage responsibility for the environment and its challenges.



With kind permission of Mid Sussex County Council

4.18 The Agency, at a national level, supports the Eco-schools initiative as auditors and technical assessors. Pupils lead a forum for the year with an environment-related project, for example, waste minimisation.

4.19 **Information:** We provide a wide range of information to all sectors of society, and in addition give many talks and presentation. The LEAP is a practical example of the material we publish which can assist in raising public awareness and understanding of environmental issues. We all have a role to play, however, in raising awareness of the importance of issues facing our local environment.

Future Partnership Opportunities

4.20 The Agency seeks to actively become involved in partnership initiatives at both strategic and local levels to achieve the objectives of sustainable development. Partnerships are regarded as a key mechanism for meeting the Agency's objectives. A partnership approach will achieve more towards a common purpose than the partners could achieve if acting independently. We have much to offer our partners – expertise, resources, credibility. A successful partnership will bring benefits to the environment and to each of the partners, not only in terms of consolidating information, but also turning that information into management options and actions.

External Funding

- 4.21 In partnership with others, the Agency is keen to maximise the amount of external funding which is spent on the environment in general. Like other organisations, there are many worthy initiatives we would like to progress but are constrained by the ever-increasing competing priorities on our budgets. Many external funding streams, for example UK Government and European Funding, offer opportunities to help ensure sustainable improvement in the quality of the environment as a whole. With others we plan to fully explore and utilise these where appropriate. Working in partnership with those who share similar objectives should hopefully increase our and other organisations' chances of securing funding to the benefit of the environment.

Not only are we interested in obtaining external funding, but the Agency also actively seeks to influence these substantial spending programmes so as to maximise environment gain and contribute towards the achievement of sustainable development.

5.0 ENVIRONMENTAL ISSUES AND OPTIONS FOR ACTION

Introduction

- 5.1 This section of the LEAP lists environmental issues which may need to be addressed within the Final Plan. They have been identified following a preliminary consultation of our primary stakeholders (See para. 1.16).
- 5.2 We are grateful for the contribution of the time and effort of respondents and consultees.
- 5.3 The issues presented are intended to encourage debate and to seek your views on the environmental issues which face the Arun and Western Streams area. Many of the issues are inter-related and this reflects the need for integrated environmental management. Background information is provided for each issue together with potential options for action and partners. The issues were identified from an assessment of the existing environment and the pressures upon it. Further information is detailed in the Environmental Overview which can be obtained, if required, from the Agency on a CD ROM.
- 5.4 The issues are not arranged in any particular order of relative importance. Detailed costings of options for actions have not been made but estimations are given: High (H - above £250,000), Medium (M - £50,000 - £250,000) and Low (L - below £50,000). It should be noted that estimated costs are a total financial cost for any action with the Agency not necessarily being the main contributor. Therefore costs could often be shared between a number of organisations.
- 5.5 It can be assumed throughout that the 'Do Nothing' option incurs no cost at present and this could be considered as an advantage. However, it has to be remembered that this is only a short-term situation since by not addressing the issues, costs will only be delayed (and maybe compounded).




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ENVIRONMENTAL ISSUES AND POTENTIAL OPTIONS FOR ACTION

Issue 1: Climate Change may Reduce the Protection provided by Sea and Tidal Defences

Background: There is concern that the impacts of climate change will reduce the standard of protection provided by sea and tidal defences to land and property from flooding. In particular shingle embankments will be susceptible to sea level rise and increased impact of waves. This is particularly relevant in areas of intensive development along the coast.

Issue No. 1	Climate Change may reduce the Protection provided by Sea and Tidal Defences				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Reduced standard of defence in long-term. Increased flood risk to land and property with risk to life.			
Review standards of Sea and Tidal Defence	Accurate baseline information to assess risk and evaluate options	Resources Cost	M	Agency Local Authorities MAFF	
Monitor climate change impacts	Enable better management of defences	Resources Cost	M	Agency Local Authorities MAFF	
Forward schemes to improve standard of defences	Reduced risk of flooding	Resources Cost	H	Agency Local Authorities MAFF	



NB: Water Resource and Water Quality issues are considered in issues 3 and 16.

Issue 2: The Need to Continue to Raise Awareness and Improve Air Quality

Background: The Agency is committed to helping the Government deliver the National Air Quality Strategy (1997) which sets statutory air quality standards (AQSs) for eight key pollutants and objectives to be achieved by 2005. We do this primarily through the regulation and authorisation of emissions to air (and to water and land) from major industrial processes through Process Industries Regulations (PIR) under EPA 90. There are no breaches of AQSs known to be caused by authorised PIR processes in the LEAP area. 90% of air quality problems are due to traffic and many of the ozone problems come from Europe. Road traffic-related pollution is thought to be causing breaches of the AQS for ground-level ozone (O₃) in urban areas in the summer on a regional scale, and high concentrations of nitrogen dioxide (NO₂) in excess of the AQS near major roads in Horsham, Chichester, Worthing and Bognor Regis.

Part 4 of the Environment Act places responsibility for local air quality management with the local authorities, which includes pollution arising from traffic. However, the local authorities and the Agency in Sussex co-ordinate local air quality monitoring and information provision through the Sussex Air Quality Steering Group. The need to improve air quality is a particular concern of our Sussex Area Environment Group.

The Agency has recently issued a Pollution Inventory which can be viewed on the Agency web site. This provides further information about pollution from a wide range of industries, including a report showing that Smith Kline Beecham in Worthing has spent over £1 million on an environmental improvement scheme to reduce Volatile Organic Compound emissions from their site, resulting in a reduction of over 50% since 1995.

Issue No. 2 The Need to Continue to Raise Awareness and Improve Air Quality					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Resources	Limited liaison on Air Quality			
Continue to use and extend the Pollution Inventory to cover details on landfill sites, STWs and industries covered by IPPC Directive	More detailed information on pollution from industry in the local area	Resources	L	Agency	
Continue to promote Air Quality improvement through the Sussex Air Quality Steering Group	Co-ordinated environmental planning. Improved Air Quality	Resources	L	Local Authorities Agency	

Issue 3: Sustainable Water Resources Management must be Forwarded

Background: There is a perceived concern by the public and various organisations that there are insufficient water resources in the south to meet future demands. The greatest demand on water resources is from public water supplies and this is a particular issue for the south-east due to rising per capita household consumptions, development pressures, and the predicted effects of climate change. Reliable yields are being reassessed throughout England and Wales to consider climate change predictions and sustainability of our environmental resources. Successive investigations have shown that, at the regional level, there are sufficient resources available or capable of development to meet needs now and in the future, subject to resources being managed according to sustainable principles and on water being shared between the various water companies in the region. In 1997, the Water Resources in the South East Forum was created with all the water companies in the south-east, the Agency, Ofwat and DETR. Together, we are working to develop a sustainable water resource strategy for the next 30 years, and the potential impact of development scenarios upon water resources in the south-east region has been presented to SERPLAN for consideration in the revision of regional planning guidance (RPG9).

Within the Southern Region our strategy for sustainable water resources continues to be founded on promoting demand management; transferring supplies from areas of surplus to areas of deficit; protecting existing resources; ensuring sufficient water resources for environmental needs and new resource development

Demand Management: Demand management promotes policies and measures to influence the consumption and waste of water. These can include leakage control, metering, use of water-efficient devices and equipment (e.g. low volume washing machines and reduced-flush WCs) and water/waste minimisation initiatives by business and industry. Waste water recycling and reuse creates opportunities for retaining water resources in the catchment. The Agency will continue to promote the implementation of demand management options, water conservation and reuse measures, where appropriate, into local development plans. As part of its R & D programme the Agency is currently working collaboratively with Southern Water to assess the costs, water saving







and customer acceptability of having a standard single flush toilet retro-fitted to dual flush operation. Around 25 homes in Littlehampton are being fitted following a pre-installation monitoring period. Other initiatives to reduce consumption of water are being forwarded with local authorities, schools and industry, including provision of water butts at a reduced rate for householders.




Protection of Existing Resources: The need to protect existing groundwater resources from pollution is vital. New regulations, which came into force in April 1999, will require further pollution prevention measures for certain activities to ensure protection of groundwater. A proactive input to local development planning is essential to ensure no unsuitable development takes place in sensitive groundwater protection areas. During 1999 the Agency will publish revised groundwater protection zone maps.

Supply Transfers: Southern Water has implemented a scheme to support the water resources abstracted from the Worthing Chalk Block in winter by piping water from Hardham. (See Issue No. 5).

Environmental Needs: The Agency has presented its National Environment Plan (NEP) which includes those environmental improvements considered necessary as part of the water companies' investment commitments for this Periodic Review (AMP3). The Government has announced support for these proposals but negotiations are continuing and final decisions will be made by the regulator Ofwat later in 1999 [see Issue No. 4]. The sites at Swanbourne Lake and Fishbourne have been included in the Agency's NEP. [see Issue No. 6].

We are continuing to evaluate the possible effects of climate change regionally and nationally and with the water companies, as an essential component of our strategic water resource planning. We are not yet in a position to assess the potential impact on this catchment, but as further information becomes available we will apply it to local resources.

Issue No. 3 Sustainable Water Resources Management must be Forwarded					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No cost in short term	Continuing uncertainty over sustainability of current management			
Continue long term water resource planning for the south-east - including implications of climate change	Sustainable use of water resources Decreased risk of supply problems and unnecessary resource development	Cost	H	Agency Water companies Ofwat DETR SERPLAN GOSE Local Authorities	  
Promote proactive role in development planning	Reduce pressure on environment and extend water resource balance	Resources	H	Agency Local Authorities Water companies	
Promote and encourage further demand management and water conservation	Sustainable use of water resources. Long term cost savings	Public acceptance Initial costs and resources	H	Agency Water companies Ofwat Local Authorities Developers Public Industry Agriculture	 

Issue No. 3	Sustainable Water Resources Management must be Forwarded				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Promote wastewater recycling and reuse	Retains water in catchment. Reduces water demand	Studies needed to assess cost and risk	M	Water companies Agency Industry	
Develop and implement strategy for targeting activities which pose particular risk to groundwater	Protect and enhance groundwater quality	Resources Cost	M	Agency Local Authorities Industry	 

Issue 4: Managing Water Resources to balance needs of abstractors with the protection and enhancement of the natural environment

Background: There are many pressures on the use of water in the LEAP area and balancing these requires careful management. The River Arun and River Rother support many uses including fisheries, agricultural abstractions, public water supply and general amenity, and the Arun is also used for navigation. These rivers also support a range of habitats dependent on freshwater and tidal regimes.

The Rother in particular has been used for water supplies for agriculture and drinking water for many years and has a major abstraction for public water supply at Hardham. This is controlled by a minimum flow requirement over Hardham weir set in 1962, to prevent low flows being excessively reduced by the abstraction. Recent work to review the output of this source, along with all others in England and Wales, has focussed attention on the need to improve our knowledge for flow requirements in the Rother just upstream of the confluence with the Arun. The Agency has commenced a detailed study into fish movement and invertebrate species in the river, with the objective of reviewing this residual flow requirement and determining in-river needs on a sounder basis. This is likely to have implications for the abstraction at Hardham particularly in time of drought.

Southern Water Services, who operate the Hardham source, also plan to investigate its further development by means of artificial recharge of groundwater. Existing boreholes are used for supply at times of low river flow. There may be scope to increase the amount of groundwater stored by artificially injecting treated water at times of high river flow, and abstracting it when needed. The environmental effect of this will, however, have to be carefully investigated before such a scheme could proceed. [See Issue No. 5].

Whilst the River Rother is an important source of water for public supplies and agriculture, by far the greatest source is groundwater from the chalk with some 83% of the licensed abstraction total. It is used by Portsmouth Water and Southern Water and a number of farms. The Agency believes that in general terms the chalk is now fully exploited and it has a policy of presumption against any further abstraction. However, individual cases still have to be determined on the relevant facts.




Locally, there has been evidence of over-abstraction around Swanbourne Lake in Arundel Park and the Agency has put forward a strategy for dealing with this (See Issue No. 6).




There are also concerns that the Fishbourne source, operated by Portsmouth Water, would adversely affect a Local Nature Reserve (LNR) and Chichester Harbour if it were used to its full

licensed extent. At present it is used at approximately half this rate. Under the AMP3 process Portsmouth Water will investigate the impact on the LNR of taking up the unused 7.5 Ml/day. If this proves detrimental the Agency may seek to reduce the licensed quantity.

A model to measure transient groundwater flow on the Brighton/Worthing Chalk Block in order to obtain a better understanding of flow, is being developed in partnership with Southern Water Services. Preliminary investigations are taking place and the Agency is currently reviewing groundwater boreholes and undertaking flow measurements of streams. Costs to cover this work have been set aside for the next 2 years. A similar model has already been developed by the Agency for the Chichester Chalk Block.

The vast majority of abstractions for both surface and groundwaters are controlled by licences issued by the Agency under the Water Resources Act 1991. The provisions of this Act are largely unchanged from the original legislation introduced in the Water Resources Act of 1963. These have now been reviewed by the DETR and the Government's way forward was published in March 1999. Titled "Taking Water Responsibly", the report marks the most significant change in water abstraction law for over 30 years and among the measures to be implemented is the introduction of time limits for the majority of licences, the requirement for the Agency to produce catchment based Local Abstraction Management Strategies and a proposal to abolish compensation for revoked licences after the year 2012. It is also proposed to bring trickle irrigation within the licensing system. At present this form of irrigation is exempt from control and it therefore has the potential to derogate from existing lawful abstractors and to result in adverse environmental impact on habitats. It is, however, an efficient form of irrigation from the viewpoint of water conservation and hence the principle of such use is not discouraged by the Agency in the longer term.



Issue No. 4	Managing Water Resources to balance needs of abstractors with the protection and enhancement of the natural environment				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing (not an option under the terms of the WR Act 1991)	Cost	Environmental damage			
Develop Model of groundwater flow on the Brighton/Worthing Chalk Block	Better understanding of flow and management of resources	Cost Resources	M	SWS, Agency	
Review flow requirements in lower River Rother	Achieve better balance between needs of abstractors and environmental flow requirements	Cost	M	Agency	
Investigate artificial recharge at Hardham	Will determine whether scheme is feasible	Cost	H	Agency, SWS	

Issue No. 4		Managing Water Resources to balance needs of abstractors with the protection and enhancement of the natural environment			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Promote winter storage where applicable for summer abstraction	More effective use of water resource	Planning implications. Flood and conservation implications	L	Agency, Abstractors, Landowners, Local businesses	
Investigate impact of full Fishbourne licence (mandatory under Habitats Directive)	May lead to better protection of habitat	May lead to reduction in public water supply source	M	Agency, Portsmouth Water Company	
Implement outcome of abstraction licence review (mandatory)	Better management of water resources	Resources	H	Agency Water Companies	

Issue 5: The possible development of the resource at Hardham to help meet future water needs.


Background: The Hardham area has an unusual geology with underlying Folkestone sands forming a natural underground basin. Hardham was first developed as a surface water source in 1950 with the abstraction from the River Rother. However, it was soon realised that in order to meet projected demands additional groundwater sources would be required. A series of experiments into the feasibility of both lagoon and borehole artificial recharge into the Hardham Basin were conducted from the 1960's to the 1980's and it was concluded that both lagoon and borehole recharge were feasible and practicable. Southern Water Services are now re-examining this option based on taking excess flood water from the River Rother in the winter and using this to recharge the excess storage capacity in the Folkestone Beds. The potential environmental impact must, however, be assessed and addressed. [See Issue No. 4].

The Agency are investigating the possibility of converting the Minimum Residual Flow (MRF) abstraction at Hardham to an Ecologically Acceptable Flow. The MRF is a rate of flow which must be left in the river and was stipulated when the licence was varied in 1962. New environmental analysis techniques now allow the impact of the MRF upon river ecology to be examined. As part of the investigations the Agency is looking into biological indices for abstraction to assess what flow is needed to support life during critical flow periods.

Issue 5		The possible development of the resource at Hardham to help meet future water needs			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do nothing	Cost	Other water resources would have to be developed			
Undertake further investigations into resource development	Potential for more effective use of resources	Cost Potential environmental implications	H	Agency, SWS	
Review basis of MRF	Sounder basis for controlling abstraction	Possible resource implication	M	Agency, Abstractors	

Issue 6: Alleviating the problems at Swanbourne Lake

Background: Investigations by the Agency showed that water levels in Swanbourne Lake rise and fall in continuity with the surrounding levels in the Chalk and water flows in and out of the lake through the margins. Water company abstractions have been shown to be damaging to the lake, particularly during drought conditions. Dredging of silt from Swanbourne Lake to make the lake deeper is planned to take place in 2000 with the agreement of English Nature (the lake forms part of the Arundel Park SSSI). The disposal of the silt will need careful management to ensure no detrimental environmental impact. To help address the concerns Portsmouth Water's Slindon borehole licence was reduced in February 1998 from 11 million litres/day to 2.5 million litres/day, whilst Southern Water's Madehurst licence will be reduced from 13.5 million litres/day to 4.5 million litres/day under a scheme agreed by the Agency and Southern Water. A cost-benefit has been carried out and the scheme has been included in the Agency's National Environment Programme which was endorsed by the Secretary of State in March 1999.

Issue 6		Alleviating the problems at Swanbourne Lake			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued detrimental impact on natural environment and recreation			
Implement approved scheme	Environmental enhancement	Disposal of dredged silt Loss of public water supply	H	Agency, SWS, Arundel Estate, Portsmouth Water Company	

Issue 7: Opportunities to Protect and Enhance Biodiversity need to be identified and forwarded

Background: The Agency is the one of the lead partners in the conservation of biodiversity in the UK and the responsible organisation for a number of water-related species. There are various actions which need to be undertaken in order to achieve the commitments in the UK Biodiversity Action Plan and these are further detailed for Sussex in the Sussex Biodiversity Action Plan (BAP).

We must work with others to develop targets for Habitat and Species Action Plans and ensure their implementation across the Arun and Western Streams LEAP area. This Issue (7) deals with Species Action Plans in Sussex, while Issue 8 covers Habitats Actions Plans and Issue 9 the more specific concerns about the decline of breeding wading birds in the Arun Valley.

The Arun and Western Streams catchment contains a number of rare and local species. However, continued loss and degradation of wetland and riverine habitats has and will continue to lead to decreases in biodiversity and the loss of these species. Further ecological monitoring in the catchment will increase the understanding of the distribution of these species and identify areas which they may be able to recolonise. They will also allow an enhanced understanding of the environment upon which future management decisions can be based, which is imperative in resolving the increasing stresses and strains upon the natural environment.

A three year investigation is being carried out in a partnership between the Agency, Cardiff University, the Wildfowl and Wetlands Trust and the National Environmental Research Council (NERC) to look at the ecology of the Little Whirlpool Ram's Horn snail in Sussex. The snail is known to exist only at 9 sites in the UK, 3 of which are in the Arun Valley.

In the LEAP area action plans are being developed for:

- Otter and Water Vole

Opportunities exist for habitat enhancement through the South-east Otters and Rivers Project to encourage movement of otters from Hampshire and Surrey. This will involve fencing off road and rail crossings points, creating safe havens and constructing artificial otter holts along the rivers. The main population of water voles in Sussex is in the watercourses of the coastal plain around Chichester Harbour and Pagham Harbour. A population of water voles is currently being monitored by means of electronic tagging with plans to introduce them to a site in the Arun Valley.

- Dragonfly - *libellula fulva*

This dragonfly occurs only in the Upper Arun SSSI in Sussex. A SAP will be written by the end of March 2000.

Several animal and plant species have been introduced into the Arun and Western Streams LEAP area and compete directly with our native species. Plants species such as the Giant Hogweed, Himalayan Balsam, the Australian Stonecrop, the water fern (*Azolla spp*) and Japanese knotweed flourish to the detriment of wetland and riverine species. Management programs are needed to control the spread of these species and begin to eradicate them from areas where they currently exist. Areas of the River Arun, Loxwood Stream, Boldings Brook and Warnham Mill Pond, have been surveyed for Giant Hogweed as part of a collaborative project between Horsham District Council and the Agency. Control of giant hogweed has been attempted in the study area over a period of 3 years with subsequent monitoring, but has not been successful and treatment will need to be reviewed. Japanese Knotweed is present on the River Lod and the Upper Arun, Himalayan

Balsam is ubiquitous throughout the Arun catchment and Floating Pennywort exists at Pagham Rife.







Floating Pennywort causes particular problems by blanketing the water surface and blocking off sluices. Urgent treatment spraying with Diquat is needed to eradicate the problem.
















The Arun Valley Project has since 1995 worked very successfully with the Agency, in partnership with Arun District Council, carrying out wildlife surveys, listing rare species and looking at recreational opportunities. In 1999 the Project added the Western Rother to its programme to become the Arun and Rother Valley Project with a wider remit to include landscape, land use and cultural heritage and is now based with the Sussex Downs Conservation Board.





The Agency, in partnership with Arun District Council, has carried out substantial works on an Arun DC owned site near Middleton to create pools and other wetland habitats. The scheme is part of a wider conservation and recreation project, which aims to create a community woodland on the site over the course of the next few years, to be managed by the Woodland Trust.

Alder trees occur along the banks of rivers and streams in the Arun catchment, particularly the Rother. They are currently under threat from the root disease *Phytophthora*. The distribution of the disease in the LEAP area is not fully understood and this needs to be determined in order that a management programme for the species can be established.

There are opportunities for school parties to visit Agency land at Pagham Harbour.

Issue No. 7	Opportunities to Protect and Enhance Biodiversity need to be identified and forwarded				
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued loss of important biodiversity. Failure to meet Government targets			
Forward opportunities to improve the environmental value of existing river corridors and create new corridors in urban and suburban areas	Create new conservation areas and recreation areas	Cost Land ownership	H	Agency, Landowners, LAs, Conservation groups	 
Forward opportunities for protection and enhancement of biodiversity through land use planning	Protection and enhancement of habitats	Resources Land take increased	L	Agency, Local Authorities, Landowners, Water Companies, Developers	 
Encourage recolonisation of the otter and water vole to the catchment with provision of improved habitat	Species and Habitat Enhancement	Resources Cost	M	Agency, Sussex Wildlife Trust, English Nature, Local Authorities, Landowners	 

Issue No. 7 Opportunities to Protect and Enhance Biodiversity need to be identified and forwarded					
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Forward and promote the protection and spread of rare species	Enhance biodiversity	Resources	L	Agency, EN, MAFF, Landowners, Local Authorities, Sussex WT, other conservation groups and organisations RSPB	 
Establish management programmes for alien species	Protection of native species	Resources Cost	H	Agency, MAFF, Landowners, EN, Local Authorities, other Government Agencies Railtrack and Highways	 
Undertake urgent control of Giant Hogweed infestation at Boldings Brook and River Lox at Loxwood.	Prevent threat of infestation in the medium to long term of the whole Arun Catchment. Prevent serious health and safety implications.	Resources Cost	H	Agency	 
Undertake project to control outbreaks of Japanese Knotweed on the River Lod and the Upper Arun near Horsham.	Prevent threat of infestation.	Resources	H	Agency	 
Undertake project to control Floating Pennywort on the Pagham Rife	Removal of invasive plant	Resources	L	Agency	  
Identify opportunities for partnerships and external funding	More effective use of limited resources	Perceived conflict of interests	L	Agency	 
Continue to forward our work with the Sussex Biodiversity Partnership	Continued enhancement of habitats	Resources	L	Agency, West Sussex CC, Sussex Wildlife Trust, FWAG, RSPB, English Nature	 

Issue No. 7	Opportunities to Protect and Enhance Biodiversity need to be identified and forwarded				
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Assess distribution of alder root disease (<i>Phytophthora</i>) and monitor spread	Protection of an important native tree species	Resources	L	Agency, MAFF, Landowners, EN	 
Equip Pagham Harbour classroom for use by school parties.	Opportunities to promote environmental education	Resources	L	Agency District Councils	 

Issue 8: Loss and Degradation of Wetland and Riverine Habitats and Opportunities for Enhancement

Background: Under the commitments of the UK Biodiversity Action Plan (BAP), a number of specific habitats are listed as being under the responsibility of the Agency for protection, enhancement and creation.

The following habitats for which Action Plans are being developed are found within the LEAP area.

- Ponds
- Rivers and streams
- Reed beds
- Flood plain grasslands

In the Sussex BAP, a focus has been placed on specific habitats through local Habitat Action Plans (HAPs), several of which are relevant to the Arun and Western Streams area. This Issue (8) deals with HAPs in Sussex, **Issue 7** covers Species Actions Plans and **Issue 9** deals with the more specific concerns over the decline of breeding wading birds in the Arun Valley. The Agency has produced a HAP for reedbeds and for floodplain grassland. The Agency will write a HAP for lakes, canals, rivers and streams by mid 2000. Opportunities for reedbed enhancement or creation exist at the Wildfowl and Wetland Trust reserve in Arundel and at Pulborough Brooks and both are being actively progressed.

Agricultural improvements, previous river engineering practices, and lack of, or poor, maintenance have all contributed to the loss and degradation of wetland and riverine habitats. For example, agricultural drainage has lead to the decline of a number of wetland habitats, most notably of traditionally managed floodplain grassland; water quality has declined due to pollution from agricultural run-off and bankside vegetation has been removed due to agricultural and flood defence activities. Action is now urgently required by the Agency to prevent further damage to, or loss of, remnant habitats, and to enhance existing habitats and create new habitats where opportunities exist.

The heavily engineered stretches of the lower Arun are of particular concern in terms of river habitat degradation. The restoration of naturally functioning floodplain habitats not only improves the ecological value and biodiversity of an area, but also acts as a store and filter for floodwaters and a balance of water resources. However, any such proposal has to be balanced with agricultural requirements and need to provide defence to properties (subject to cost benefit).

In the upper reaches, features such as riffles and pools have been lost through channelisation and deepening for flood defence purposes. This process needs to be reversed and the reinstatement of meanders, riffles and pools would bring about increased biodiversity and habitat quality and elevate the status of fisheries.

There is an opportunity for restoration and desilting of an ancient pond at Chingford and for significant enhancements to the River Stor channel and immediate river corridor.

The Agency must promote the retention of buffer strips of vegetation along all watercourses in the LEAP area to help reduce the impact of agriculture and improve water quality. Buffer strips also have further benefits of wildlife habitat creation, improving fisheries and river bank stabilisation and creating corridors along which wildlife can move. Although the long-term aim would be to create buffer strips throughout the area, initial plans should be focused upon priority areas in need of restoration. Targeting could be achieved using results of River Corridor and River Habitat Surveys. Furthermore, the installation of buffer strips could run together with a tree planting and management programme. Key partners such as the Arun and Rother Valley Project, FRCA and MAFF should be involved in this work.
















The Agency is required by MAFF to produce Water Level Management Plans (WLMPs) for selected wetland Sites of Special Scientific Interest (SSSIs). Plans have been produced or are being produced for 5 sites in the Arun and Western Streams area, namely, Amberley Wildbrooks, Waltham Brooks, Upper Arun, Pagham Harbour and the Arun Banks. A key objective of these WLMPs is to maintain or return the SSSIs to their condition at the time of notification, with the further long-term view of enhancing their habitat quality and value. A review of consents for EC designated sites will need to be undertaken.






















By far the richest habitats for plants in the catchment are the ditches of the middle Arun and the lower end of the Rother. Many of these hold very diverse communities with many uncommon or rare species. Their continued diversity depends on the use of sensitive management techniques. It is in these ditches that many of the rare aquatic flora and fauna are found, including the nationally rare Sharp-leaved Pondweed, Cut Grass (*Leersia oryzoides*) and True Fox Sedge (*Carex Xulpina*). This area of the Arun Valley is one of the most important "hot spots" for Biodiversity in the country. A survey on the flora of the Arun Floodbanks is required to guide the "in-house" works force when carrying out mowing and a biological survey of Amberley Wildbrooks would help increase understanding of current stresses in this area. Opportunities exist for tree planting particularly in the Burpham Loop.










The Teville Stream in Worthing is a site for a possible future habitat enhancement with a programme of giant hogweed removal, tree management, enhancement of the reedbed area and general channel clearance. The Agency are progressing this as a partnership project between Agency, BTCV, Worthing Borough Council and others.

There are opportunities to enhance Agency owned sites throughout the LEAP area, such as Ferring Rife, to benefit wildlife and encourage access to the countryside.

Implications of climate change on the environment needs to be assessed. (See Issue No. 3).

Issue No. 8	Loss and Degradation of Wetland and Riverine Habitats and Opportunities for Enhancement				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued loss of important habitats. Failure to meet Government targets			
Deliver HAPs for reedbeds, vegetated shingle, ponds and floodplain grasslands	Conservation of key riverine and wetland habitats as directed in local and national BAPs	Resources and costs	M	Agency, Biodiversity Partnership, Landowners, Conservation groups and organisations	  
Protect, enhance and create saltmarsh and reedbed habitats throughout the LEAP area, including land at the Wildfowl and Wetland Trust at Arundel.	Improve and increase areas of nationally important habitats. Compliance with local and national HAPs (reedbeds).	Resources Costs	M	Agency, Biodiversity Partnership, EN, Landowners, Local Authorities, Sussex WT, Wildfowl and Wetlands Trust, other conservation groups and organisations Water companies	  
Forward opportunity for reedbed creation at Pulborough Brooks	Improve habitat for wildlife, including bittern	Resources	L	RSPB, SWS, Agency	  
Identify target areas for habitat protection, restoration and creation	Production of a focused restoration program for the Arun and Western Streams. Protection and enhancement of riverine and wetland habitats	Resources	L	Agency, EN, Sussex WT, Arun & Rother Valley Project Other conservation groups and organisations, Local Authorities, MAFF	  
Seek to reinstate meanders and pool/riffle sequences, especially in the upper stretches of the Arun & Western Streams	Improvement in river habitat quality with resulting increases in biodiversity; improved status of fisheries.	Resources Costs. Potential issues for flood defence.	H	Agency, MAFF, Local Authorities, Landowners, Sussex WT, Conservation groups & organisations	  

Issue No. 8		Loss and Degradation of Wetland and Riverine Habitats and Opportunities for Enhancement			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Carry out restoration and desilting of Chingford Pond	Benefits for wildlife, landscape and amenity	Resources	H	Agency, WSCC, SDCB	 
Carry out restoration and desilting of Storrington Pond	Benefits for wildlife, landscape and amenity	Resources	M	Agency, Horsham DC, Storrington Conservation Group Landfill Money operators	 
Carry out enhancement of Warnham Mill Pond	Benefits for wildlife, landscape and amenity	Resources	L	Agency Horsham DC	 
Undertake enhancement of the River Stor channel and river corridor	Benefits for wildlife, landscape and amenity	Resources	L	Agency Arun & Rother Valley Project	 
Promotion of buffer strips along watercourses	Improved quality of river and bankside habitats. Enhanced traditional landscape.	Resources Costs	M	Agency, MAFF, EN, Landowners, Sussex WT, Conservation groups & organisations FWAG, FRCA	  
Ensure production and implementation of habitat-focused WLMPs for Amberley, Waltham, Upper Arun, Arun Banks, Pagham Harbour	Assured protection of sites of national conservation value.	Resources Costs	M	Agency, MAFF, Landowners, EN, Sussex WT, Conservation groups and organisations IWA & Wey and Arun Canal Trust	  
Undertake survey on flora on the Arun floodbanks	Obtain accurate and detailed information to assist when carrying out mowing	Resources	L	Agency	 
Monitoring and management of Cut Grass (<i>Leersia oryzoides</i>)	Protection of rare species	Resources	L	Agency EN Landowners	  
Undertake biological survey of Amberley Wild Brooks	Accurate information for increasing understanding of current status, stresses and strains	Resources Costs	M	Agency	 


Issue No. 8		Loss and Degradation of Wetland and Riverine Habitats and Opportunities for Enhancement			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Develop a tree planting and management programme, particularly at Burpham Loop	Improved quality of river and bankside habitats. Enhanced traditional landscape	Resources Costs Restricted access for maintenance	M	Agency, EN, Forestry Authority, MAFF, Landowners, Sussex WT, Conservation groups & organisations	 
Forward opportunities for enhancement of the Teville Stream, Worthing	Improve habitat for wildlife in an urban area	Resources	L	Worthing BC, Agency, BTCV, Local communities	 
Promote enhancement and conservation of Ferring Rife and other Agency owned sites throughout the LEAP area	Benefit to wildlife and access to the countryside	Resources	L	Agency	 
Review the consents affecting the Arun pSPA (comprising Amberley Wildbrooks, Waltham Brooks and Pulborough Brooks), the Mens, Chichester and Pagham Harbours	Prevent detrimental effects on EC designated sites	Resources	L	Agency	  

Issue 9: There is concern at the decline in breeding wading birds in the river valleys

Background: Wetlands are a major wildlife resource covering some 25,000 ha in Sussex and some of the finest are to be found in the Arun LEAP area. There has, however, been a dramatic decline in the numbers of breeding wading birds (lapwing, redshank, snipe) in the river valley generally and in some areas the birds are no longer breeding at all.

Sites such as Pulborough Brooks and Amberley Wildbrooks in the Arun Valley demonstrate the potential for lowland wet grassland management and are an important contribution towards BAP targets for this habitat. Wet grasslands used by breeding birds can be severely affected by changes in water management and in 1995 the Agency produced a Water Level Management Plan for Amberley Wildbrooks to address this problem. As a result of the Plan a trial raising of 50mm at each of the 5 water control structures is being carried out.

Possible reasons for this decline include changes in drainage patterns which have resulted in formerly wet grassland being dry during the spring and early summer when snipe and redshank are looking to breed. Changes in grassland management with more intensive grazing may have led to greater trampling of nests, while cutting of hay and conversion to silage is damaging to waders if these operations take place during the breeding season. In some areas growth of scrub along former ditches may also have contributed to the decline in breeding birds, which prefer a more open landscape.

Issue No. 9		There is concern at the decline in breeding wading birds in the river valleys			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued decline in bird numbers			
Identify and forward opportunities for environmental enhancement to address concerns in the Arun Valley	Address decline in wading birds	Cost	H	Agency, RSPB, English Nature	


Issue 10: Protection of native crayfish in the River Rother

Background: The Agency has a statutory duty to promote the conservation of flora and fauna dependent on aquatic habitats. The white-clawed crayfish, *Austropotamobius pallipes*, is one such animal. It is a freshwater crayfish and is also one of the species identified as being of key importance in the UK Biodiversity Action Plan Steering Group Report published in 1995. In its role as "contact point" for the white-clawed crayfish, the Agency has a key role in promoting the implementation of practical actions needed to conserve the species.

A disease which has devastated native crayfish in many parts of England and Wales is caused by the fungus *Aphanomyces astaci*, commonly known as Crayfish Plague. This infects only freshwater crayfish. The North American signal crayfish carries the fungus, but does not seem to suffer any ill effects. However, all native European crayfish species are highly susceptible to the disease.

To prevent the spread of crayfish plague, it is necessary to eliminate the means by which it is spread. Equipment such as nets, traps and waders used in waters where there are known to be non-native crayfish or, where a native crayfish mortality has occurred, should be left to dry out thoroughly and treated with a proprietary disinfectant before re-use.

There is a small population of native crayfish at the top of the Rother catchment. This is in danger of disease spread by the American crayfish which is also present in the Rother. At the moment these two populations are separated by one small weir. The crayfish population is also threatened by drought and pollution.

Issue No. 10		Protection of native crayfish in the River Rother			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Resources	Potential loss of the white clawed crayfish			
Identify and action measures to protect remaining native crayfish population from contamination by non-native crayfish	Restrict spread of crayfish plague	Cost Resources Viability	M	Agency Angling Clubs Landowners	

Issue 11: Promote Sustainable Fisheries Management

Background:: In the Arun and Western Streams LEAP area, there are a number of issues relating to the sustainable management of fisheries. These include the maintenance of riverine habitats for fish, the control of fish stocking procedures, the control of alien fish species, angling regulation for both coarse and game fish and the control of illegal fishing practices. Such issues are important from both ecological and commercial viewpoints.

There is a limited understanding of the status of the sea trout population within the LEAP area. Until recently the Agency has been dependent upon rod-catch return data to determine changes in the population and most assessments were made upon anecdotal evidence. Data is now obtained from a fish counter situated at Hardham, which provides a minimum estimate of the number of migratory sea trout.

A fish trap constructed on the River Arun at Billingshurst is due to come into commission during 1999 and will provide information on migratory species in this catchment. Further understanding of habitat and flow requirements of sea trout will be obtained from a five year radio tracking study in the lower reaches of both the Arun and Rother catchments in a project commissioned by the Agency.








Fisheries surveys and angling catches have revealed that small native brown trout are found throughout the upper and middle reaches of the Arun and many of its tributaries.

There is some concern about the potential adverse impact of water abstraction intakes on the status of fisheries in the Arun. Abstractions at Hardham could lead to the mortality of fish, particularly fry, which are drawn into abstraction pipes. In January 1999, the amended section 14 of the Salmon and Freshwater Fisheries Act 1975 was implemented, which made it compulsory for screens to be placed across such intakes. The Agency must ensure full compliance with the Act at all abstraction points in both catchments.

Illegal practices such as netting and the introduction of alien fish species are causes for concern within the LEAP area. Illegal netting in the lower stretches of the Arun needs increased levels of enforcement to protect important fish stocks. The uncontrolled introduction of alien fish species such as Catfish and Zander threatens native species through competition, predation and the spread of disease.

There is concern with respect to increased siltation on the Rother and the potential impact this poses to fisheries (See issue No. 14).





The Agency is undertaking research into the effects on fish of oestrogenic hormones in the aquatic environment. [See Issue No. 23]

Issue No. 11 Promote Sustainable Fisheries Management					
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Decline in the status of fisheries in the Arun & Western Streams			
Determine the status of the sea trout populations in the catchment	Increase the population of sea trout in the Arun & Western Streams	Resources Cost	M	Agency Angling clubs	
Ensure abstraction intakes are appropriately screened	Comply with amended Act	Resources Cost	M	Agency , Southern Water Other abstractors	 
Assess the scale of netting in the estuaries of the Arun, the Western Streams, Chichester and Pagham Harbours	Conservation of fish stocks	Resources	L	Agency	
Maintain, and improve where possible, levels of fisheries enforcement	Conservation of fish stocks	Resources	L	Agency, Police Sussex Sea Fisheries Committee, MAFF	
Management of introduced fish species	Conservation of native fish stocks and native biodiversity	Resources	L	Agency, Angling clubs, EN MAFF	 

Issue 12 The Free Passage of Sea Trout and Coarse Fish is Restricted by Obstacles in the Rivers

Background: The Agency is committed to maintaining, improving and developing fisheries in accordance with section 114 of the Water Resources Act 1991. As such, the Agency must ensure the free passage of native fish species within the catchment. Weirs and sluices can act as barriers to the movement of fish. There are a number of these structures in the Arun catchment which can prevent fish from reaching the breeding areas and thus lead to a decline in the status of the fishery.






In high flood flows, fish may be displaced downstream or "washed-out" in the absence of suitable refuges. The ability of fish to return upstream is then limited due to the presence of in-river barriers such as weirs and sluices, unless fish passes have been installed. Displacement of fish may also occur through the opening of bottom-opening gates. The impact of in-river structures such as weirs and sluices (including bottom-opening gates) should therefore be reviewed and the potential examined for their removal or improvement through a phased approach. Where appropriate, fish passes should be installed which allow the passage of both salmonid and cyprinid fish. Low cost elver passes have now been fitted to some of the major structures on the River Arun.

Issue No. 12: The Free Passage of Sea Trout and Coarse Fish is Restricted by Obstacles in the Rivers					
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Decrease in status of fisheries in the Arun and Western Streams			
Review the status and function of all in-river structures and potential for removal	Conservation and enhancement of fisheries	Resources Cost	H	Agency, Local Authorities, MAFF, Landowners, EN, Sussex WT, Angling clubs	
Review the operation of sluices and gates	Conservation and enhancement of fisheries	Resources Cost	L	Agency, Local Authorities, MAFF, Landowners, Angling clubs	
Evaluate options for replacement of bottom-opening gates with top-opening gates	Conservation and enhancement of fisheries	Resources Cost	H	Agency, Local Authorities, MAFF, Landowners, Angling clubs	
Construction of viable fish passes for both salmonids and cyprinids, and modify existing passes where necessary.	Increases access of fish, particularly Salmonids, to important spawning areas.	Resources Cost	H	Agency, Angling clubs Landowners	

Issue 13: Lack of Water Level Control due to the Deterioration of Land Drainage Structures and equipment can impact on conservation, fisheries and navigation

Background: The land drainage of the low lying Arun and Western Streams valleys primarily serves agricultural interests and is managed through a number of key structures including pumping stations (5 on the Arun and 1 each on the Broad Rife and Aldingbourne Rife) and river level control structures. Many of these and other associated structures are in excess of 40 years old, and are at or beyond their design life. All of these structures on the Arun are maintained for conservation /fisheries /navigation purposes and serve very little or no flood defence purpose.







Considerable costs are associated with maintenance and operation of these structures and there may be no direct cost benefit in replacing the structures. The Internal Drainage Board (i.e. the Agency in the LEAP area) is also unlikely to have the financial resources to repair or replace structures within the IDB area when this becomes necessary. WLMPs for the whole of Sussex are in the final stages of drafting. The extent to which these plans will rely on the various structures needs to be assessed, so those that are vital to the success of the plans can be repaired or replaced as one of the first priorities.

Issue No. 13: Lack of water level control due to the Deterioration of Land Drainage Structures and Equipment can impact on Conservation, Fisheries and Navigation					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Short-term cost	Loss of management for flood defence, land drainage, farming, conservation, fisheries and irrigation.	-		
Carry out asset survey and correlate with WLMPs	Identifies problems and options	Resources Cost	M	Agency (IDB) Landowners, Farmers EN, MAFF, Sussex WT, RSPB, Sussex Downs, Conservation Board	  
Repair smaller sluices	Some improvement in management at key sites for which there is a WLMP	Resources Cost Not systematic within overall Strategy	M	Agency (IDB) Landowners, Farmers EN	 

Issue 14 : Farming practices have led to the excessive siltation of the River Rother




Background: A significant increase in the quantity of soil washed into the River Rother off the land has been identified. This increases flood risk, reduces water quality and leads to siltation. Where siltation occurs on gravels these areas are lost for spawning.




The Arun and Rother Valley Project are investigating the siltation of the River Rother. Southampton University were also commissioned to investigate siltation accumulation in the Rother. Their studies have shown that fine sediment accumulation takes place in areas of slackwater controlled by river gradient, weirs and local morphology. Long-term management of the sediment at source would be the best option, with short term mitigation measures unlikely to be successful in dealing with high sediment loads in the Rother downstream of Midhurst. The Agency is also awaiting the results of its National R & D Project on the effects of siltation on Freshwater Riverine Fisheries.

Issue No. 14		Farming practices have led to the excessive siltation of the River Rother			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued loss of important habitats.			
Promote best practice including the retention of buffer strips and contour ploughing	Improved quality of river and bankside habitats	Resources Costs Loss of potential agricultural land	M	Agency, MAFF, English Nature, Landowners, Sussex Wildlife Trust, Conservation Groups FRCA, FWAG	  
Raise awareness of problems locally through PR	Help address concerns	Resources	L	Agency, Local Authorities, Fishing clubs, Sussex Wildlife Trust, Conservation Groups	  

Issue 15: Opportunities for managed realignment of tidal embankments to provide Wetland Habitat should be investigated

Background: With limited resources available to improve or replace existing tidal embankments along the River Arun, River Rother and within Chichester Harbour, opportunities are available for managed realignment of the defences so as to create wetland habitat. Such proposals would, however, need to have regard to the degree of floodrisk to property and land, agricultural implications and the conservation value of the existing habitat.

Issue No. 15		Opportunities for managed realignment of tidal embankments to provide Wetland Habitat should be investigated			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost Creation of wetland	Flood Risk to land and property Loss of agricultural land Loss of existing conservation value			
Maintain /improve defences	Protection from flooding Protection of existing conservation areas and agricultural land	Cost Opportunities for wetland creation lost	H	Agency, Landowners, MAFF	  

Issue No. 15	Opportunities for managed realignment of tidal embankments to provide Wetland Habitat should be investigated				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Forward opportunities for managed realignment of tidal defences	Managed creation of wetland	Resources Flood Risk Possible loss of agricultural land and conservation areas	H	Agency, Landowners, English Nature, Sussex Wildlife Trust, Fishing clubs, Conservation Groups, MAFF, Chichester Harbour Conservancy	  

Issue 16: Compliance with EU Standards and Agency Objectives for Water Quality

Background: Although the majority of the watercourses in the LEAP area currently comply with EU Directives and the Agency's River Ecosystem (RE) targets, there are some concerns which require investigation by the Agency.

Detailed biological and chemical surveys are required to identify the causes of the poor water quality in the Boldings Brook and the Sutton Stream. There is also a need to address biological quality problems associated with Horsham, Pulborough, Petersfield and Billingshurst Sewage Treatment Works (STWs). In addition the presence of foam below Horsham STW is of concern. Domestic detergents in sewage effluent can cause significant build-up of foam, especially in the summer, due to the low base flow in the Arun and hence, lack of dispersion.

There is a need to review the current biological monitoring network and dependent on successful trialling, to introduce biological quality objectives for rivers in the LEAP area.

Assessments have been made of the state of the watercourses in the LEAP area, based on chemical water quality using RE targets. Compliance assessment based on data for 1997 showed that 21 stretches in the LEAP area did not achieve their RE targets. Of these 3 stretches failed the RE target by two classes (Elsted Stream - Road Bridge, Stanbridge Stream - u/s Petersfield STW, River Kird - Staples Hill).

The Agency is currently investigating three STW discharges, Horsham, Lidsey and Sidlesham, to determine the impact of the discharge on the eutrophic status of the River Arun, Lidsey Rife and Broad Rife, respectively. This work, which is being carried out under the EU Urban Waste Water Treatment Directive, aims to designate those receiving waters which show evidence of eutrophication as Sensitive Areas (Eutrophic). If the eutrophication is shown to be due to the STW, measures will need to be taken to reduce the nutrient content of the discharge and therefore reduce the eutrophication of the receiving water.

There is concern regarding the eutrophic nature of Ferry Pool adjacent to Pagham Harbour. The Pool is supplemented by water abstracted from the Broad Rife which receives effluent from Sidlesham STW. The Agency is currently investigating the impact of this discharge on the eutrophic status of the Broad Rife. This work will contribute to the assessment of the impact of the abstraction on the eutrophic nature of the Pool.

There have been compliance issues for discharges from STWs and many of these have been addressed by Southern Water Services through their Asset Management Plan (AMP2), the




strategic business plan developed for the period 1995-2000. The water industry's regulator, Ofwat, has now initiated AMP3, the next periodic review of water company prices for the period 2000-2005. The Agency has proposed a number of schemes for investment in this period which are currently being negotiated with the water companies and Ofwat.




The Agency's aim is to ensure all discharges to the sea comply with EU Directives. In 1998 Felpham Bathing Beach failed to comply with the Bathing Water Directive. The Agency is currently investigating this failure to identify the cause and areas for improvement.

The areas of water to which Bognor, Littlehampton and East Worthing STWs discharge were designated as High Natural Dispersion Areas (HNDA) under the EU Urban Waste Water Treatment Directive. Such status potentially allowed effluent to be treated to a lower standard than that required by the Directive. However, in the document *"Raising the Quality"* (September 1998), the Government set out its thinking on future requirements for achieving environmental improvements for the period 2000-2005. The Government has indicated that a minimum standard of secondary treatment will be required for all significant discharges.

Potential pollution of surfacewaters and groundwaters from landfills within the LEAP area is also an issue for the Agency in relation to water quality standards and objectives. [See Issue Nos. 3, 17].

If river flows are reduced in Summer and early Autumn there are implications for the water quality of rivers and the standards of treatment necessary at STWs to meet River Quality Objectives. A national Agency study has suggested that climate change could be a reason for the overall trends in the decline of water quality in the Southern Region. Potential reasons for such a trend include a decrease in rainfall and an increase in temperature, leading to lower flows in rivers and streams, decreases in dissolved oxygen and increases in water temperature. However, the overall effects of climate change are confusing and it is difficult to make comment yet at a local level.

Issue No. 16		Compliance with EU Standards and Agency Objectives for Water Quality			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Non-compliance and degradation in environmental quality			
Identify biological and chemical water quality problems and prioritise appropriate remedial actions through the development of improvement plans	Improved water quality	Cost	M	Agency	
Assessment of discharges from Horsham, Lidsey, Sidlesham STWs with regard to designation as Sensitive Areas (Eutrophic)	Improved water quality and fisheries.	Cost	M	Agency, SWS	
Continue investigations and address causes of the eutrophic nature of Ferry Pool, adjacent to Pagham Harbour	Improved water quality	Cost	M	Agency	

Issue No. 16 Compliance with EU Standards and Agency Objectives for Water Quality					
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Investigate the failure at Felpham Bathing Beach and identify areas for improvement	Improved bathing water quality	Cost	M	SWS Agency	
Complete AMP2 commitments at East Worthing, Bognor Regis and Littlehampton STWs	Improved water quality. Benefits to tourism and environment.	Cost	H	Agency SWS	
Monitor implications of climate change	Maintain water quality	Cost	L	Agency	

Issue 17: Intermittent Pollution of Watercourses

Background: Oil has been the main pollutant in the LEAP area since 1995, with pollution by domestic heating oil being a general issue for West Sussex. Leakage and accidental spillage of oils and other polluting liquids from industrial estates can also cause intermittent pollution of both surface and groundwaters. Estates where there is a pollution risk need to be prioritised. In the LEAP area there has been intermittent pollution to surface water on Brooklands Lake, Worthing.

Occasional discharges from breakages in electric power cables supplying the rail network occur in the area. Oil is used for insulation of such cables and breakages can result in releases of substantial volumes of oil into the environment. Through liaison with Railway Companies operating in the local area (eg Railtrack), the Agency will seek to reduce this type of intermittent pollution.

Rupture of domestic heating oil tanks are frequent causes of intermittent pollution which may impact on watercourses. These tanks are often poorly maintained and rarely banded, making them a high risk source of oil pollution. A campaign aimed at raising awareness of the potential problems caused by these tanks will be undertaken by the Agency.







Sewage and pump-out discharges from boats within Chichester Harbour can cause pollution. Chichester Harbour Conservancy in partnership with the Agency, has been the first in the country to install a free sewage pumping facility for yachts so that waste goes off for treatment through the sewerage system rather than being dumped directly into the sea. Chichester Harbour is designated as an SSSI, SPA/Ramsar and cSAC, thus the Agency has a duty to protect such sites of national and international interest. We will increase the awareness of boat users within the estuary to reduce this source of intermittent pollution.



Many sewerage systems in the country are designed to collect both foul sewage and storm water; these are known as combined systems. As the sewerage systems has a limited capacity, release points for storm sewage are required within the system to avoid flooding of land and properties. These release points are known as Combined Sewer Overflows (CSOs) and typically discharge to inland surface water systems or direct to rivers, estuaries and coastal waters. These are consented by the Agency. The overflow comprises very dilute effluent discharging to a stream or river which

would normally be in flood. Although pollution implications are minimal, care must be taken in setting the correct level of overflow. There are several CSOs in the LEAP area which need improving and are under negotiation in AMP3 (e.g. overflows at Barnham, Climping and Harting STW are of particular concern in this respect).

The water quality of the Aldingbourne Rife has recorded intermittent water quality problems. There are several pollution sources implicated including a potential impact from a CSO.

There are on-going problems with agricultural run-off from slurry disposal and pesticides, particularly on clay in the north of the area.




Issue No. 17		Intermittent Pollution of Watercourses			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued degradation of the environment			
Carry out scoping exercise to prioritise risk of pollution in all industrial estates in the LEAP area	Reduction in intermittent pollution	Resources	L	Agency, industry	
Further liaise with Railtrack to help prevent oil pollution from electric power lines	Reduction in a source of intermittent pollution. Improvement in water quality.	Resources	L	Agency, Railtrack	
Raise awareness of high pollution risks associated with domestic heating oil tanks	Reduce risk of oil pollution. Improvement in water quality	Resources Costs	L	Agency, Heating oil suppliers and customers	
Explore potential to control discharges from boats in Chichester Harbour	Improve water quality in an area of national conservation importance	Resources	L	Agency, Boat users, Local Authorities, Port Authority	
Promote environmental awareness throughout business and the community	Reduction in sources of intermittent pollution. Potential cost-benefits to business through waste minimisation.	Resources	L	Agency, Industry, Business	
Forward improvements to CSOs through AMP3 process	Improved water quality	Cost	M	Agency SWS	

Issue No. 17		Intermittent Pollution of Watercourses			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Investigate causes of water quality problems on the Aldingbourne Rife	Reduce sources of intermittent pollution	Resources	L	Agency	
Continue a farm inspection programme to detect poor waste management practices and advise on best practice	Minimise occurrences of serious farm pollution and effect on ground and surface water quality	Resources	L	Agency, MAFF/ADAS, Agricultural industry	

Issue 18: Increase knowledge of headwater streams and their protection and improvement

Background: The Environment Agency R & D Report "The Faunal Richness of Headwater Streams - Stages 1 and 2" highlighted the conservation importance of headwater streams on a national scale. Not only were headwater streams shown to support a large variety of rare macro-invertebrate species, but such streams play a major role in maintaining catchment biodiversity. However, headwater streams are also extremely vulnerable, especially with regard to changes in land use, channelisation and pollution.

Despite their importance and vulnerability, headwater streams are currently greatly under-represented in Agency sampling programmes. This is currently being addressed through sponsorship of an MSc student to assess both the conservation value and quality of Sussex headwater streams.





Issue No. 18		Increase knowledge of headwater streams and their protection and improvement			
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Loss of Natural Environment			
Continue with opportunities for partnership investigation with Coventry University	Most effective use of resources Cost	Resources	L	Agency	
Identify potentially vulnerable headwaters	Most effective use of resources	Timescales	M	Agency, Conservation Groups	
Undertake additional sampling programmes	Additional information for environmental protection	Cost Resources	L	Agency	

Issue 19: Poorly Maintained Private Sewage Treatment Facilities and Septic Tanks lead to Water Quality problems

Background: Many rural sites with private sewage treatment systems cause water quality problems due to poorly maintained sewage plants and illegal discharges from cess-pits and septic tanks. Opportunities now exist in rural areas for first time sewerage schemes to be developed with SWS and local authorities. The Agency plays an arbitration role in the event of an appeal against a decision made by SWS.

Applications for schemes have been put forward for the Wormley area and North Heath Lane, Pulborough.

The Sutton Stream, a tributary of the Rother, needs investigation into the deterioration of the water quality, which may result from rural sewerage problems.

Issue No. 19	Poorly Maintained Private Sewage Treatment Facilities and Septic Tanks lead to Water Quality problems				
Options for action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Continued poor rural water quality			
Undertake a scoping study to identify scale of problem and to prioritise areas for action	Reduce sources of intermittent pollution	Resources Costs	M	Agency, Local authorities	 
Investigate deterioration of the Sutton Stream	Potential environmental improvement	Resources	L	Agency	 

Issue 20: Promote sustainable access to the water environment for recreation

Background: The Agency has a duty to provide for and promote water recreation having regard to other environmental factors. This is particularly relevant in areas where the Agency owns or has control of land or water. Improvements for access can be achieved in association with the Agency's other activities, such as flood defence schemes. We need to identify the areas which can absorb increased activity in the future and those which are environmentally sensitive to existing or increased recreational activity. We are concerned at the potential risk of erosion and loss of integrity of floodbanks with increased use of embankments, particularly for cycleways and horseriding. The Agency also needs access to watercourses to maintain the flood defences under our control and access for beach management purposes. Issues such as access for the disabled and public safety must also be taken into account. We will use the outcome of our own research into the recreational use of floodbanks to guide us on the appropriate use of different types of floodbanks. We need to establish and maintain liaison with organisations in relation to waterside access and recreation.

The needs of recreation, conservation and flood defence have to be carefully balanced with each other and those of other users. Potential conflicts exist in the Chichester Harbour and Pagham Harbour areas with regard to their SAC/SPA designation and increased recreational use. Chichester Harbour is also in the area covered by the Solent Forum and opportunities exist here for partnerships and effective recreational zoning.

The Agency has issued a Recreation Strategy for the Southern Region, which was the result of a collaborative project between the Agency and the English Sports Council, with additional support from the Countryside Commission. The Strategy focuses on recreation activities which relate to the water environment and includes access and facilities for recreation.




There is a demand for increased amenity and recreational facilities associated with the water environment in the urbanised areas of the catchment. In particular there is a lack of provision for disabled anglers and the facilities for angling on river, canals and stillwaters could be increased.










The Arun and Rother are extensively used for coarse angling and trout fishing (both migratory and non-migratory). There are often disputes between different recreational users and the needs and considerations of all parties should be carefully considered when drawing up proposals. Any commitments to increase recreational use should take into account the need to protect and enhance local wildlife habitats.

The majority of river waters available for canoeists nationally are tidal waters which have a public right of navigation. Elsewhere water courses are in private ownership and permission must be obtained from the riparian owners. On the Arun Common Law rights of navigation extend as far as Pallingham Weir on the tidal section. There are few launching opportunities in this tidal section and a demand exists for greater canoe access. At present, canoes can launch from any public access point along the banks of the Arun and trailer boats can be launched from the Fisherman's Quay at Littlehampton. There is no public right for landing above Swan Bridge, Pulborough. The Agency is currently pursuing appropriate design solutions for access points.

The Agency is a partner in the Arun and Rother Valley Project which was set up to conserve and enhance the landscape, nature conservation and amenity value of the Arun and Rother Valleys. The project partners achieve this aim by encouraging and supporting farmers and landowners with advice on grants and schemes, by co-ordinating effective working relationships with other organisations concerned with the Arun Valley and by promoting local community awareness and involvement in the area.

Opportunities for the restoration of canals within the Plan area would generally be supported by the Agency where these are compatible with its duties. [See Issue No. 21]

Issue No. 20		Promote sustainable access to the water environment for recreation			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Recreational capacity over-reached			
Prepare access strategy for Rivers Arun and Western Streams to include opportunities for waterside recreation and recreation on the water	As above	Resources	M	Agency Local Authorities SDCB Arun & Rother Valley Project CC EN Sussex WT British Canoe Union Landowners Other Users, IWA	  

Issue No. 20		Promote sustainable access to the water environment for recreation			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Forward opportunities for increased recreational access to the water environment	Increased access	Potential risk of erosion and loss of integrity of floodbanks and increased maintenance. Health & Safety liability	M	Agency Local Authorities SDCB Arun & Rother Valley Project CC EN Sussex WT British Canoe Union Landowners Other Users, IWA	  
Promote access to water in planning conditions for waterside development (where compatible with other pressures)	Increased access to water and conservation. Potential increased value to development	Public safety Security Costs of maintenance and management	M	Agency Developers LPAs Landowners	  
Prepare and implement Management Plans for Agency sites	Reduce conflict between recreational use, environmental needs and local community	Resources	L	Agency, South Downs Conservation Board	  

Issue 21: Restoration of canals for recreation






Background: The Agency generally supports the restoration of canals within the Plan area where this is compatible with its duties. The two canals in the LEAP area are the Chichester Canal and the Wey and Arun Canal.

The restoration of the Chichester Canal as a fully navigable waterway is supported by many agencies in the county, however, there are many issues which would need to be addressed in order to achieve this, including restoration of bridges and locks and replacement of reedbeds. At present the Chichester Canal Society runs a trip boat service and the canal is used by canoeists and rowers. The four mile towpath is fully open and heavily used by walkers, cyclists and anglers

The Wey and Arun Canal Trust was formed in 1970 with the aim of restoring the canal as a navigable route. At present, most restoration work is carried out by volunteers with the consent of the appropriate landowner. In total some 50% of the canal has been worked on by the Trust. Restoration is complete on about 20% of the canal. A trip boat operates on one of the restored sections. The Wey South Path traces as far as possible the former route of the navigation and accessible reaches of the towpath are popular with walkers.




Studies undertaken for the Wey and Arun canal have identified main environmental challenges to be:


- ensuring that appropriate mitigation of any impact on SSSIs and other valuable wildlife habitats can be achieved;
- maintenance of water quality in the canal when it is discharged and when it mixes with river water;
- loss of variety of woody vegetation which is now established; in places this now provides a locally valuable landscape feature.
- availability of water resources.

Issue No. 21	Restoration of canals for recreation				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Less water-based amenities			
Continue to be member of the Wey and Arun Working Group	Provision of information and guidance relevant to all stages of development of the scheme	Resources	L	Agency	 
Support restoration of Canals as navigable waterways subject to compliance with other Agency duties	Re-introduction of water based species Increased recreational facilities	Cost	L	Agency	  

Issue 22: Erosion of banks, disturbance of wildlife and danger to river users caused by speeding and large water craft along the navigable lengths of the River Arun

Background: There is a public right of navigation on the tidal sections of the River Arun and the Agency has land drainage byelaws to control speed limits on the tidal stretches. There is a particular concern that wash from speeding boats may be accelerating erosion of the banks of the River Arun upstream of Arundel. Therefore, there is a need to further enforce speed limits to protect river banks and the Agency has been carrying out speed checks on the Arun since May 1999 using radar equipment.


Issue No. 22	Erosion of banks, disturbance of wildlife and danger to river users caused by speeding and large water craft along the navigable lengths of the River Arun				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Acceleration of bank erosion			
Enforce speed limits for boats on the River Arun through byelaws	Reduce bank erosion	Costs of monitoring and enforcement	L	Agency Local Authorities	  

Issue No: 22		Erosion of banks, disturbance of wildlife and danger to river users caused by speeding and large water craft along the navigable lengths of the River Arun			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Promote education and awareness to river users	Reduce bank erosion	Resources	L	Agency Boat users	

Issue 23: The effect of oestrogenic hormones (endocrine disrupters) on the aquatic environment



Background: Although there is no absolute scientific proof, there is increasing evidence that some of the changes in the reproductive system recorded in wildlife are caused by exposure to certain chemicals released into the environment. Research carried out by the Agency nationally on selected rivers, including the Arun, has indicated that an oestrogenic effect could be caused in fish when exposed to sewage effluent downstream of outfalls from sewage treatment works. The level of hormones in the aquatic environment is not certain, and the results of the survey must be considered against a background of improving water quality, achieved through better sewage effluent quality.

Samples of roach from the River Arun at Horsham were examined as part of the national Research and Development project "The Identification and Assessment of Oestrogenic Substances in Sewage Treatment Works Effluents". Results from this initial survey have led to further initiatives to look at endocrine disrupters within the River Ouse in Sussex by means of a collaborative project with Sussex University. The Agency has issued a consultation document called "*Endocrine Disrupting Substances in the Environment: What should be done*".

Issue No: 23		The effect of oestrogenic hormones (endocrine disrupters) on the aquatic environment			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Less information on the effects of endocrine disrupters on the aquatic environment			
Continue with environmental and effluent monitoring to determine the concentrations, fate and behaviour of hormones in the aquatic environment	Environmental improvement	Resources	M	Agency, Water Companies	

Issue 24: Opportunities to Conserve Heritage in River Areas

Background: The Agency has a duty to protect and conserve heritage in areas under our responsibility. An assessment of the status of structures of heritage value would focus strategy and resources on sites of high priority and identify opportunities for partnerships.

Issue No. 24		Opportunities to Conserve Heritage in River Areas			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Potential loss of heritage			
Identify and assess sites of heritage value, particularly in the Arun & Western Streams to prioritise areas of conservation importance	Conservation of sites of high heritage value	Resources Costs	L	Agency English Heritage Local Authorities, Arun & Rother Valley Project	
Increase awareness of heritage sites through education and interpretation	Increased protection of sites of high heritage value	Resources	L	Agency, English Heritage, Local Authorities, Public, Arun & Rother Valley Project	






Issue 25: Standards of Protection Afforded by Sea Defences

Background: The South Downs Shoreline Management Plan which was published in 1996, encompasses *inter alia* the sea defences of the Arun and Western Streams. The Plan considers Strategic Defence Options for identified lengths of coastline known as management units, namely: hold the line, managed retreat, advance the line or do nothing. For all Arun and Western Streams sea defence management units the preferred option is to "hold the line" in order to protect existing infrastructure and development. More detailed management assessments of the coastline are being undertaken within Coastal Strategy Plans. An option for realignment of the defence at Medmerry has been considered within the Coastal Strategy Plan for the length of coastline between Pagham Harbour and Easthead. The Strategy will be completed in October 1999.

Standards of protection are continually reviewed, subject to Agency expenditure constraints and priorities and, where agreed with MAFF to be cost effective and offer value for money, capital schemes are undertaken. Such schemes are undertaken to provide improved standards of protection from flooding from the sea. In considering any new flood defence schemes, opportunities for environmental enhancement will be forwarded.




Coastal Strategy Plans will determine priorities for future capital schemes, and drive beach management plans post-scheme.



It must be ensured that ability to undertake maintenance and improvement works is not impeded by new development including fences, boat access ramps and storage.

Issue No. 25 Standards of Protection Afforded by Sea Defences					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Increased risk of overtopping or breaching of defence and flooding with significant risk to people and property.			
Complete coastal strategies for sustainable sea defence management	Effectively managed coastline	Costs	H	Agency, MAFF	
Identify long term maintenance arrangements and access requirements	Effective resource planning	Cost	L	Agency, Local Authorities, MAFF	 
Improve liaison and awareness of maintenance with other beach users, property owners and local authorities	Maintain standard of defence	Resources	L	Agency, Property owners, Fishermen Boat users and jet skiers, Local Authorities	 

Issue 26: Standards and Maintenance of Tidal Embankments

Background: The current standard of land drainage and tidal protection to the low lying areas of the Arun and Western Streams valleys relies on the existing tidal embankments and on the pumping stations and other control structures. Many embankments are reaching the end of their useful life and options including repair, replacement and managed retreat need to be considered. Current levels of revenue expenditure are insufficient to maintain these defences. Based on the Agency's system for prioritisation of capital and maintenance works, it is unlikely that significant maintenance works can be economically justified where these provide protection primarily to agricultural land. Similarly, capital schemes for the upgrading or replacement of these defences are unlikely to be economically viable unless domestic or commercial properties are protected..

Issue No. 26 Standards and Maintenance of Tidal Embankments					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost Potential recreation of saltmarsh habitats through reversion	Increased risk of flooding to agricultural land, people and property. Saline intrusion.			
Undertake strategic review of all tidal embankments at risk in accordance with FDMM	Cost effective approach	Cost Resources	L	Agency, Local Authorities, MAFF	  

Issue No. 26		Standards and Maintenance of Tidal Embankments			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Forward strategy for improved tidal embankments where applicable / relevant	Higher standard of protection	Costs Insufficient benefit justification Conservation impact	H	Agency, MAFF Landowners	
Promote managed realignment where appropriate	Potential wetland/saltmarsh habitat creation	Potential impact on agriculture and conservation	L	Agency, MAFF, EN, Landowners	

Issue No 27: The use of Sustainable Urban Drainage Systems (SUDS) will be forwarded in New Development





















Background: The construction of new development and consequent impermeable areas has the potential to:

- increase the rate and volume of surface water run-off into a watercourse thus increasing flood risk
- increase diffuse pollution discharging to surface waters and groundwaters
- reduce recharge of groundwaters

To date it has been practice where flood concerns are identified, to store surface water run-off during heavy rainfall in flood attenuation ponds. This ensures flood risk is not increased by limiting the rate of surface water run-off to a watercourse to that prior to development taking place.

Further opportunities exist however, for creative design appropriate to urban, suburban and rural environments which will not only address flood concerns but will substantially reduce diffuse pollution to watercourses and enhance the conservation and recreational value of flood attenuation ponds. The use of permeable pavement construction where appropriate and swales would also reduce the rate of discharge of surface water to watercourses and help maintain recharge of groundwater.






The storage and re-use of surface water in individual properties would also contribute to demand management for water [See Issue No. 3].

Issue No. 27	The use of Sustainable Urban Drainage Systems (SUDS) will be forwarded in New Development				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Increased flood risk			
Review management of existing flood attenuation ponds	Baseline information for future Strategy. Identifies problems and indicates options for resolution	Resources Cost	L	Agency , Local Authorities	  
Ensure effective management for future maintenance of flood ponds	Reduced risk and increased amenity value	Resources Cost	M	Agency, Local Authorities, Public, Developers	  
Forward strategy for SUDs in new development with local authorities	Reduction in pollution and flood risks Increased opportunities for nature conservation and recreation where appropriate	Resources Cost	L	Agency, Local Authorities, Developers, Public Water companies	  
Promote wet ponds for surface water attenuation and environmental enhancement	Enhancement of conservation and recreation	Maintenance increased Loss of land for development	L	Agency, Local Authorities, Developers, Public Water companies	  
Forward the use of rain water harvesting techniques in new development	Reduced demand on public water supply Reduced flood risk	Public acceptance	L	Local Authorities Developers, Industry Agency , Water companies	  
Forward innovative design and encourage best practice through publicity, seminars and workshops	Improved environment through education	Resources Cost	L	Agency Local Authorities Developers , Public Water companies	  
Increase managed maintenance on rivers	Reduced flood risk	Conservation disturbance Cost	H	Local Authorities, Agency Riparian Owners	 

Issue 28: The Need to Protect Floodplains






Background: There is a need to ensure the protection of river floodplains from development and any landraising to ensure their natural functioning and there is no increased flood risk to both new and existing property and land. The coastal plains of the catchment are below sea level and this low-lying land behind sea defences must be considered at risk to tidal flooding in the event of a breach or overwhelming of the defence. New development in such areas along the existing undeveloped coast should be resisted and restrictions placed on types of development in built-up areas so as to minimise the risk to life and property in the event of a severe breach or overwhelming of defences.






The zoning of areas at risk to flooding from the sea must be forwarded to help resist inappropriate development in such areas. Effective liaison with Local Authorities is essential if floodplains are to be protected. [See Issue No. 1].

Issue No. 28		The Need to Protect Floodplains			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Increased land for development	Increased flood risk and risk to life			
Further promote floodplain protection to local authorities including zoning of tidal risk areas	No inappropriate development in floodplains	Resources	L	Agency Local Authorities,	
Complete and provide more detailed flood risk information to local authorities	More effective information for forward planning and development control	Resources Cost	M	Agency, Local Authorities	
Ensure floodplain protection is identified in development plans and planning resources	More effective development control. Better support at Public Inquiry	Resources	L	Agency, Local Authorities	
Promote natural functioning of floodplains	Flood risk minimised Enhanced environment	Loss of perceived development land	L	Agency, Local Authorities	
Educate and encourage best practice through publicity, seminars and workshops	Improved environment through education	Resources Cost	L	Agency, Local Authorities, Developers	

Issue No: 29 New Development will pose increased pressure on the environment in the LEAP area





Background: The Agency is a statutory consultee on Development Plans and certain types of planning applications. It has also a duty to contribute to the objective of sustainable development. With increasing pressures for development there is an even greater need for the Agency to work closely with local authorities (LAs) to identify opportunities and forward initiatives and planning policies for the protection and enhancement of the environment.




Issue No. 29		New Development will pose increased pressure on the environment in the LEAP area			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No resource implications	Environmental degradation Flooding Pollution			
Promote and Forward effective liaison with LAs	Forward sustainable development	Resources	L	Agency, Local Authorities	
Provide relevant advice to LAs to ensure environmental policies are forwarded in Development Plans	Forward sustainable development Protection of flood plains Sustainable management of water resources, waste and surface water run-off	Resources	L	Agency	
Identify opportunities for environmental enhancement in the area	Improved / new habitats created. Sustainable development forwarded	Resources Cost	L	Agency, Local Authorities, English Nature, Sussex WT	
Identify and forward opportunities for environmental protection and enhancement in planning application responses	Sustainable management of water resources, waste and surface water run-off	Resources	L	Agency, Local Authorities, English Nature, Sussex WT	
Forward environmental capital initiatives with West Sussex County Council	Improved base information to assess environmental impact and identify opportunities for enhancement	Resources Cost	L	Agency, WSCC	

Issue No. 29		New Development will pose increased pressure on the environment in the LEAP area			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Identify / recommend possible planning obligations to forward opportunities for environmental enhancement	Ensure implementation of environmental initiatives / enhancements	Cost Resources	L	Agency, Local Authorities, English Nature, Sussex WT	 
Provide evidence to support LAs at Development Plan or Planning Appeal inquiries to back Agency objections / recommendations	Provide expert advice / information to Planning Inspectors	Resources	L	Agency	  

Issue 30: Ensuring an adequate level of protection to Chichester against flooding from the River Lavant

Background: In January 1994 flood flow in the River Lavant rose to the highest level measured. The banks of the river were overtopped causing extensive flooding of the natural floodplain and to villages along the Lavant valley. At Chichester flows overtopped the river channel at the Westhampnett Mill and in the City Centre. At Westhampnett flood waters flowed across the main road (old A27) into the Church Farm Pit, then over the new A27 Bypass and down into the Pagham Rife catchment. In the City Centre emergency earthen dams had to be constructed which prevented extensive flooding of the area. A scheme to alleviate flooding of Chichester has been forwarded by the Agency, the detail design of which is currently being undertaken. Planning permission for certain aspects of the scheme will be required together with the final approval from MAFF for grant aid.

Issue No. 30		Ensuring an adequate level of protection to Chichester against flooding from the River Lavant			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Risk of flooding to Chichester			
Complete detailed design for flood alleviation scheme	Enable grant aid and planning permission to be applied for More detailed costs available	Cost Resources	H	Agency	 
Carry out presentations to local community and LA's to raise awareness of scheme	Promote scheme concept and advantages. Broader understanding of community and LA's	Resources	L	Agency	 





Issue No. 30		Ensuring an adequate level of protection to Chichester against flooding from the River Lavant			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Apply for Planning Permission	Statutory Requirement	Time	L	Agency	
Apply for/obtain MAFF Grant Aid	Enable technically, economically and environmentally acceptable scheme to be implemented	Resources	L	Agency	 


Issue 31 The Impact of the New Contaminated Land Regulations

Background: Land contamination may be present in many sites as a result of waste disposal, for example, closed landfill sites, or industrial use, such as gas works, petrol stations, scrapyards. Such sites may present a risk of harm to the environment as a result of their former contaminative uses. Such sites will require consideration when the new Contaminated Land Regulations are implemented shortly. These regulations will place a general duty on the Agency to identify and seek the remediation of certain high risk contaminated land sites known as "special sites". We need to work in partnerships with other organisations, especially the local authorities, to address land contamination in an integrated way.

In the Arun and Western Streams area there are a number of sites which present a risk, including the Thorney Island area, where DDT contamination has been found. The Agency has held a meeting with Chichester District Council to outline investigations to date, with the Council investigating whether there are any environmental health implications from DDT contamination. The Agency is visiting MOD land to instigate land quality investigations and the MOD are checking their records to see whether DDT was widely used in the Thorney Island area.

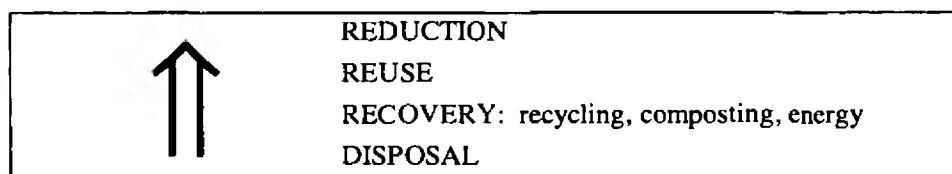
We will need to review the environmental risks associated with other sites particularly petrol stations and scrapyards.

Issue No. 31		The Impact of the New Contaminated Land Regulations			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	High risk of harm to environment			
Assess extent of contaminated land and associated risk. Seek remediation of high risk sites.	Compliance with new Regulations Systematic approach	Cost Resources	M	Agency Local Authorities Landowners	 
Ensure any redevelopment of former landfill /industrial sites fully remediates any contaminated land	Remediation and re-use of contaminated land	Cost	H	Agency, Local Authorities Developers	 

Issue No. 31 The Impact of the New Contaminated Land Regulations					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Continue land quality investigations to assess levels of DDT in Thorney Island area	Safeguarding public health	Resources	L	Agency MOD Chichester DC	

Issue 32 : The Sustainable Management of Wastes must be Forwarded to Reduce the Impact of Waste on the Environment

Background: The Agency has a role to play in encouraging sustainable waste management practices in five key areas: regulation, influencing the market, planning, promotion, and data acquisition. The Agency's principal aim is to contribute towards attaining the objective of sustainable development. For waste management, this means reducing the amount of waste produced, making the best use of the waste that is produced, reducing the impacts of wastes on the environment, and encouraging the movement up the 'waste hierarchy'. The waste hierarchy was established in the 1995 Government White Paper on sustainable waste management, 'Making Waste Work', and is as follows:



The hierarchy does not aim to be prescriptive, because the Best Practicable Environmental Option (BPEO) for particular types of waste may differ. The Agency will therefore promote the identification of the BPEO for each waste 'stream' through Life Cycle Analysis (LCA). At present some 97% of wastes from the LEAP area are sent to landfill. However, such capacity in West Sussex is limited. (See Issue No. 33). In order to achieve sustainable waste management, and to meet targets set out in *Making Waste Work*, levels of minimisation, reuse and recycling need to be increased for industrial, commercial and household wastes.





As the major component of household waste is putrescible matter, there is considerable scope for composting. Local Authorities are responsible for setting up home composting schemes, as well as developing more household waste recycling facilities. Proposals for composting facilities must always be compatible with the protection of the local environment, in relation to surface water runoff contamination, and emissions to air.






There is concern regarding the increases in waste generation that will arise from new proposals for housing and commercial/industrial development, and the need to ensure adequate provision of recycling facilities in conjunction with development, through local planning policy and planning conditions. We are promoting local initiatives with businesses and encouraging a greater understanding of waste minimisation and recycling in the public and private sectors through seminars, educational leaflets, and our recently produced Waste Minimisation and Recycling Directory for Businesses in Sussex. The Agency is currently running a series of seminars to businesses, one in each district council area across West Sussex (total of 7). These are about raising awareness of environmental legislation and how businesses are likely to have to comply and are part of the West Sussex Commercial Waste Reduction Programme.

We are also investigating opportunities for clinical waste minimisation at Bognor hospital. We aim to build on this work by establishing a partnership with Sussex Business link, local waste

management businesses and Local Authorities, in order to encourage greater waste minimisation in a more strategic and co-ordinated way. We will also support local authorities in the inclusion of specific policies and conditions encouraging sustainable waste management in local authority development plans and planning consents. [See Issue No. 29].

In partnership with local authorities, we are also working to raise awareness and achieve waste minimisation in schools which adopt the Tidy Britain Group's 'Eco-Schools' standard.

Issue No. 32	The Sustainable Management of Wastes must be forwarded to Reduce the Impact of Waste on the Environment				
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Increased pressure on existing facilities Need for more sites in potentially sensitive areas Do not achieve Government sustainable waste management targets	-	-	
Undertake education campaigns for public, business and public sector	Waste reduction /reuse/recycling Reduced costs to business, environmental benefits	Resources	L	Agency, Local Authorities, Industry Public sector	
Promote recycling/ composting initiatives and facilities	Reduced landfill disposal	Cost	L	Agency, Local Authorities Public, Private contractors	
Require adequate provision of recycling facilities in new proposals for housing and commercial/ industrial development	Waste recycling. Reduced landfill disposal	Resources Public perception	L	Agency, LPAs, Developers	
Evaluate impacts of existing waste minimisation and recycling campaigns	Assesses value for money, understand changes leading to good practice and better promotion of objectives in future	Resources	M	Agency, Local Authorities, Public, Industry	

Issue No. 32: The Sustainable Management of Wastes must be forwarded to Reduce the Impact of Waste on the Environment					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Develop collaborative waste minimisation initiatives with business and local authorities	Builds on work already undertaken. Encourages voluntary action. Reduced production of waste and resource use. Environmental benefit. Reduced costs to businesses	Resources	L	Agency, Local Authorities, Business and Industry	  
Work with schools on waste minimisation and education	Encourages good practice at an early age. Reduced waste. Environmental and financial benefits.	Resources	L	Agency, Local Authorities, Schools Tidy Britain Group	 







Issue 33: The Capacity of Existing Landfill Sites for the Disposal of Wastes will be Utilised Within Eleven Years

Background: As waste minimisation, reuse and recycling initiatives become established the quantity of waste requiring final disposal should reduce. However, some wastes will always require landfilling. It is recognised that at current rates of disposal, all licensed landfill sites in the LEAP area will be full in the next 11 years.

There are insufficient waste management facilities in the LEAP Area for the recovery or disposal of waste tyres, partly due to the large numbers of garages in the area. There is a waste transfer station in Worthing, but local landfill sites are licensed to dispose of only a restricted quantity of tyres due to inherent problems with 'floating' and fire hazards. This has resulted in a build up of tyres at scrap yards, vehicle dismantlers, tyre outlets, and flytipping. [See Issue No. 34].





Other options for waste disposal and treatment include incineration and anaerobic digestion. Any waste management facility requires authorisation from the Agency. In determining any application, we will ensure we follow the principles of BPEO [See Issue No. 32]. Fly tipping is a problem more prevalent in the River Arun area than the River Rother, but the problem is likely to increase. [See Issue No. 34].

In addition, there is a shortage of facilities for managing clinical wastes. Some low level clinical waste is disposed of at Washington landfill site, just outside the LEAP area, but the majority is transported to London for incineration. This is also in conflict with the 'proximity principle' of disposing of wastes close to where they are generated. As well as requiring new disposal facilities, an Agency project to reduce the amount of clinical waste has been conducted. Through better segregation at source the project aims to ensure the waste going into the clinical waste stream actually is clinical waste.

Issue No. 33		The Capacity of Existing Landfill Sites for the Disposal of Wastes will be utilised within eleven years			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No cost	Lack of disposal route Inappropriate waste storage			
Forward sustainable waste management in advising planning authorities on sites, methods of disposal and policies in Waste Local Plans	Forward Waste Hierarchy.	Resources	L	Local Authorities Agency	
Promote waste tyre recovery and disposal facilities	Appropriate waste management	Resources	L	Local Authorities Private Sector, Agency	
Promote facilities for commercial/ industrial waste treatment/recovery/ disposal	Proximity principle Forward waste hierarchy	Resources Public perception	L	Local Authorities Private Sector, Agency	
Provide relevant waste data to local authorities for planning and waste strategies	Ensure effective waste planning	Resources	L	LAs, Private Sector, Agency	
Ensure any new proposals for management of waste follow the principles of BPEO	Ensure sustainability	Resources	L	LAs, Private Sector, Agency	
Forward opportunities for clinical waste minimisation	Reduced disposal costs	Resources	L	Local Authorities Private Sector, Agency	

Issue 34: Illegal Waste Disposal (Fly Tipping) must be Controlled in Liaison with Local Authorities

Background: With the introduction in 1996 of the Landfill Tax, fly tipping was generally expected to increase. A lack of adequate data on the levels of fly tipping before the introduction of the Landfill Tax however, means that this is unlikely to be confirmed with accuracy. We have developed a protocol for the regulation of fly tipping with Local Authorities and this provides clear guidance on those categories of flytipping to be dealt with by the Agency and those to be dealt with by Local Authorities.










Issue No. 34 Illegal Waste Disposal (Fly Tipping) must be Controlled in Liaison with Local Authorities					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No Cost	Increased risk of flooding and pollution. Habitat degradation			
Encourage public and landowners to report Take action against offenders	Reduced pollution risk	Resources Cost	L	Local Authorities Public, Agency	 
Educate and increase public awareness	Improved amenity value Reduced operational costs in long term Reduced pollution risk	Resources	L	Local Authorities Agency, Public, community residents' groups and schools	 

Issue 35: Rubbish in Watercourses and the storage of materials on channel bank tops can lead to increased flooding

Background: The illegal disposal of rubbish, including garden refuse/cuttings, into watercourses and the storage of materials and waste on river bank tops are of particular concern. Apart from degradation of amenity, such materials can be washed downstream in flood flows (when flow may overtop channel bank tops), causing obstructions within the channel which can cause or exacerbate local flooding. This is particularly relevant where blockage of culverts and screens can occur, as has occurred at the following sites:

Blackbridge Lane, Horsham on the River Arun
 Petersfield Stream on the Petersfield/Winchester Road
 Shripney Lane Ditch and Bartons Lane Ditch on the Aldingbourne Rife, Bognor
 Between Lavant and Sheepwash Lane on the River Lavant
 Barnham Rife
 Cakeham Ditch and Hale Farm Ditch, East Wittering
 Lidsey Rife and Elbridge Rife

Issue No. 35 Rubbish in Watercourses and the storage of materials on channel bank tops can lead to increased flooding					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No Cost	Increased risk of flooding and pollution. Habitat degradation			

Issue No. 35		Rubbish in Watercourses and the storage of materials on channel bank tops can lead to increased flooding			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Encourage public and landowners to report Take action against offenders	Reduced pollution risk Reduced flood risk	Resources Cost	L	Local Authorities Public, Agency	  
Educate and increase public awareness	Reduced flood risk Improved amenity value Reduced operational costs in long term Reduced pollution risk	Resources Additional costs in short term	L	Local Authorities Agency, Public, community residents' groups and schools	  
Increase maintenance work on rivers	Reduced flood risk	Conservation disturbance Cost	M	Local Authorities Agency, Internal Drainage Boards, Riparian owners	  


Issue 36: Potential Increase in Land Application of Wastes

Background: The land application of waste, such as sewage sludge, to agricultural land has the potential to cause serious pollution and risk to health if not properly managed and controlled. This activity is currently carried out in the area and is likely to increase over the next few years due to increased sewage treatment, higher landfill costs and the cessation of sea disposal of sewage sludge since the end of 1998. There is concern regarding the long-term environmental capacity of the land to absorb these wastes. Careful monitoring and regulation is required to ensure the procedure does not represent a hazard to health via the food chain and that it is carried out without harming the environment, including the pollution of sensitive groundwater resources.

The Agency has responsibility for effectively enforcing regulations which allow the application of such wastes to agricultural land where beneficial effects can be demonstrated.



The treatment and use of sewage sludge on land is subject to European and UK legislation and is controlled by regulators and also by industry codes of practice and agreements between retailers and water companies. The sludge regulations are due to be revised in 1999 to require improved treatment of sewage sludge before application to land. This will include the phasing out of the use of untreated sludge for grassland and most crops by the end of 1999, with a full ban by the end of 2001. SWS has a sludge strategy for the treatment and use of sewage sludge to ensure directives and codes of practice are complied with. This will eliminate liquid sludges recycled to land.

The exemption of industrial waste spread on land from waste management licensing is under review by the Government.

Issue No 36		Potential Increase in Land Application of Wastes			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No Cost	Pollution risks Environmental capacity exceeded	-	-	
Develop and implement a coherent strategy for regulation	Nutrients to agricultural land/ecological benefit Sustainable waste management route	Complex legislation Environmental capacity of land in long term	M	Agency Landowners/ Farmers Southern Water MAFF Industry	

Issue 37: Potential Risk of Water Pollution from Closed Landfills

Background: Leachate from old closed and unlined landfills has the potential to cause significant environmental impact. Several sites are known to present a high risk of harm to surface waters, including Westhampnett where West Sussex County Council are installing a leachate intercept trench; Shelleys Farm, Barnes Green where W S Atkins have provided various schemes for intercepting leachate. The Agency have held a meeting with Horsham District Council to agree the best option for Shelleys Farm. Slight fire retardant pollution has been observed in the monitor borehole south of Slindon and the Agency has instigated a monitor programme to identify if fire retardants are commonly found in landfill leachates i.e. the observed pollution problem at Slindon is common to groundwater around dilute and disperse landfill sites. There is concern with leachate migration at Castle Goring Landfill. The introduction of the contaminated land provisions of the Environment Act 1995, will require the Agency to identify and seek remediation of certain high risk contaminated land sites, to be known as 'special sites'. [See Issue No. 31].

Issue No. 37		Potential Risk of Water Pollution from Closed Landfills			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Cost	Water pollution	-	-	
Identify priority sites of concern and investigate pollution risk	Identification of scale of potential problem and options for action	Resources Cost	L	Agency Local Authorities	
Remedial action where necessary	Reduction of pollution	Cost to owner, LA or Agency	H	Agency, landowners, Local Authorities	




Issue 38: Methane from landfill sites is contributing to greenhouse effect

Background: Methane is estimated to be between 20 and 30 times more damaging, as a greenhouse gas, than carbon dioxide. Under anaerobic conditions, biodegradable waste breaks down to (essentially) a mixture of methane and carbon dioxide. The concentration ratio is dependant upon numerous factors including age of waste, site conditions and moisture content and is neither a predictable nor exact science. In consequence, there are endless computations both theoretical and practical of the quantity of methane generated by unit weight of degradable refuse. ETSU (Energy Technology Support Unit) suggests that each tonne of degradable refuse should produce 6m³/annum for ten years after placement and 4m³ / tonne for the succeeding 10 to 50 years. In theory the total quantity generated could be as high as 400m³/tonne. The following currently operational landfills in the Arun catchment Area accept biodegradable waste:

Clock House, Capel
Brookhurst Wood, Warnham
Wastelands, Lidsey




In addition there are more than 20 former landfill sites that are probably generating significant quantities of landfill gas. Although carbon dioxide is a greenhouse gas, it is less damaging than methane and some sites therefore have gas incineration facilities which burn off the methane, producing carbon dioxide and in some cases, energy for electricity production. Sites with these facilities are:

Warnham Brickworks (Flare and brick kiln utilisation)
Drayton Manor, Chichester (Flare)
Halewick Lane, Sompting (Flare and until recently electricity generation)
Faygate Landfill Site
Pendean, Midhurst (Flare)

Issue No. 38					
Methane from landfill sites is contributing to greenhouse effect					
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	Save on capital expenditure	Release of more potent greenhouse gas Loss of opportunity for electricity generation			
Seek to improve management of methane gas generation from landfill sites through flaring or utilisation schemes for energy. Promote use of Landfill Tax to encourage recycling of methane generating waste that would otherwise go to landfill	Net reduction of greenhouse gas emissions equivalent to 825,000 tonnes Carbon Dioxide/annum. Use of methane for waste to energy schemes (dependent on site conditions)	Cost Danger of uncontrolled release of explosive gas	M	Local Authorities Operators of landfills	  

Issue 39: The Impact of Mineral Extraction

Background: The Arun and Western Streams area is an important area for mineral extraction. The draft West Sussex Minerals Local Plan identifies additional sites for mineral extraction and the extension of existing sites. The Agency has liaised with the Council in identifying constraints on future extraction. Unless managed effectively, mineral extraction can have implications on groundwater movement and quality and increase floodrisk. Surface water quality problems can also arise from dewatering activities or silt/mud being washed into watercourses. Policies and guidance are included in the Minerals Local Plan to identify such concerns and the need to address these in any proposal. Continued liaison with the Local Authorities and mineral companies is essential to ensure such concerns are addressed through the planning application stages.

Issue No. 39		The Impact of Mineral Extraction			
Options for Action	Advantages	Disadvantages	Cost	Potential Partners	Themes
Do Nothing	No resource implications	Unacceptable environmental impacts. Pollution Flooding			
Promote early consultation with Local Authorities and Mineral companies on proposals	Agency requirements identified and addressed at earliest opportunity	Resources Detailed information not available	L	Agency, Local Authorities, Mineral Companies	
Ensure the Agency's interests are addressed through effective responses to proposals	All environmental constraints identified. Relevant advice provided to enable concerns to be addressed or objection supported	Resources, Cost, Timescales	L	Agency, Local Authorities	
Back Agency requirements / objections at public inquiries in the event of any planning appeal	Provide expert advice / information to the Planning Inspector	Resources	L	Agency, Local Authorities	

APPENDIX 1:**DUTIES, POWERS AND INTERESTS OF THE ENVIRONMENT AGENCY**

The Environment Agency has a wide range of interests in the areas of water management, waste management and pollution prevention and control. Whilst many of these interests are supported by statutory duties and powers, much of the Agency's work is advisory, with the relevant powers resting with other bodies such as local planning authorities. The following table therefore summarises the Agency's duties, powers and interests and their relationship to land use planning in Southern Region.

Water Resources**The Agency has duties to:**

- Conserve, redistribute, augment and secure the proper use of water resources.
- 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.
- Determine water abstraction and impoundment licences on application.
- Publish information on actual and prospective demands for water and available resources.
- Maintain public registers of licences for abstraction and improvement.
- Promote sustainability.

The Agency has powers to:

- Revoke or vary existing licences with the consent of the licence holder. If no consent is given the matter is referred to the Secretary of State to determine. Compensation is normally payable.
- Monitor and enforce abstraction and impoundment licence conditions.

The Agency has an interest (but no powers) in:

- 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.

Partnership

- 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 will 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**Agency Duty**

- The Agency has a duty to exercise general supervision over all matters relating to land drainage and flood defence throughout each catchment. The principal aim is to provide effective defence and warning systems to protect people and property against flooding from rivers and the sea.

The Agency has powers to:

- Control, through land drainage consents, development within 8m of main river (15 m on a tidal main river) (Water Resources Act, 1991 Section 109) or construction of a structure that would affect the flow of an ordinary watercourse (Land Drainage Act, 1991 Section 23).
- Produce flood risk maps for all main rivers under s105 of Water Resources Act 1991.
- Undertake works to main rivers using permissive powers.
- Issue flood warnings relating to main rivers to the public, Local Authorities and the police.
- Control through Land Drainage Bylaws erections, excavations, etc which may affect sea defences.
- Supervise the maintenance of tidal flood defences within the Agency's jurisdiction. (Note: Many of the sea defences within the Southern Region are controlled by Local Authorities).
- Maintain and operate flood control structures.

The Agency has an interest (but no powers) in:

- Granting of planning permission throughout a catchment but especially floodplains where development can significantly increase flood risk. This permission is granted by Local Planning Authorities.
- Installation of surface water source control measures eg flood attenuation structures.
- Supervising the maintenance of ordinary watercourses which is a 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.

Partnership

- As a statutory consultee on planning applications the Agency offers advice based on knowledge of flood risk. It also advises on the environmental impacts of proposed flood plain development.
- The Agency advises solicitors on potential flood risk during property searches for prospective purchasers.
- The Agency will encourage best practice, including source control measures and common standards, among Local Authorities and riparian owners to protect and enhance the environment.
- The Agency works with the civil authorities to prepare flood-warning dissemination plans and supports their endeavours to protect communities at risk.

Water Quality**Agency Duty**

- The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.

The Agency has powers to:

- 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.
- Issue 'works notices' where action is required to reduce the risk of pollution.
- Prosecute polluters and recover the costs of clean-up operations.

The Agency has an interest (but no powers) in:

- The control of run off from roads and highways. This is a Highways 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.

Partnership

- 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**Agency Duty**

- The Agency has a duty to implement Part 1 of the Environmental Protection Act 1990.

The Agency has powers to:

- 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 Agency has an interest (but no powers) in:

- The vast number of smaller industrial processes which are controlled by Local Authorities.
- Control over vehicular emissions and transport planning.

Partnership

- The Agency provides data on PIR 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.

Radio-active Substances**Agency Duty**

- The Agency has a duty under the Radio-active Substances Act 1993 to regulate the use of radio-active materials and the disposal of radio-active waste.

The Agency has powers to:

- To issue certificates to users of radio-active materials and disposers of radio-active waste, with an overall objective of protecting members of the public.

The Agency has an interest (but no powers) in:

- The health effects of radiation.

Partnership

- The Agency will work with users of the radio-active materials to ensure that radio-active wastes are not unnecessarily created, and that they are safely and appropriately disposed of.
- 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 Health and Safety Executive on worker protection issues at non-nuclear sites.

Waste Management**Agency Duty**

- 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.

The Agency has powers to:

- Vary waste management licence conditions.
- Suspend and revoke licences.
- Investigate and prosecute illegal waste management operations.

The Agency has an interest (but no powers) in:

- 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.

Partnership

- The Agency will work with waste producers, the waste-management industry and Local Authorities to reduce the amount of waste produced, increase re-use and recycling and improve standards of disposal.

Contaminated Land**Agency Duty**

- 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.

The Agency has powers to:

- Regulate the remediation of contaminated land designated as special sites.
- Prevent future land contamination by means of its PIR, Water Quality and other statutory powers.
- Report on the state of contaminated land.

The Agency has an interest (but no powers) in:

- Securing with others, including Local Authorities, landowners and developers, the safe remediation of contaminated land.

Partnership

- The Agency supports land remediation and will promote this with developers and Local Authorities and other stakeholders.

Fisheries**Agency Duty**

- The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.

The Agency has powers to:

- 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 Agency has an interest (but no powers) in:

- The determination of planning applications which could affect fisheries.

Partnership

- Many development schemes have significant implications for fisheries.
- The Agency will work with anglers, riparian owners, developers and Local Authorities to protect fisheries.

Recreation**Agency Duty**

- The Agency has a duty to promote rivers and water space for recreational use.

The Agency has powers to:

- Contribute towards its recreation duty through the exercise of its statutory powers and duties in water management.

The Agency has an interest (but no powers) in:

- Promotion of water sports. This is carried out by the Sports Council and other sports bodies.

Partnership

- The Agency will work with the Countryside Commission, the Sports Council, British Waterways and other recreational and amenity organisations to optimise recreational use of the water environment.

Conservation**Agency Duty**

- The Agency will further conserve the environment, 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 powers to:

- Exploit opportunities for furthering and promoting conservation with regard to water management and pollution control. The Agency has no direct conservation powers.

The Agency has an interest (but no powers) in:

- 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 Biodiversity Plan for which it is the contact point for 12 species and one habitat.

Partnership

- 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.

Landscape**Agency Duty**

- 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 has powers to:

- 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 Agency has an interest (but no powers) in:

- The landscape impact of new development, particularly within river corridors. This is controlled by Local Planning Authorities.

Partnership

- 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**Agency Duty**

- 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 has powers to:

- Promote its archaeological objectives through the exercise of its water-management and pollution-control powers and duties.

The Agency has an interest (but no powers) in:

- Direct protection or management of sites of archaeological or heritage interest. This is carried out by LPAs, County Archaeologists and English Heritage.

Partnership

- 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.

Navigation

Agency Duty

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The Agency has powers to:

- *

The Agency has an interest (but no powers) in:

- The management and operation of navigations within the region.

Partnership

- The Agency will work with British Waterways, other navigation authorities and navigation users to improve navigations generally as valuable environmental, recreational, commercial and heritage resources.

* The Agency is not a Navigation Authority in this LEAP area

APPENDIX 2**ORGANISATIONS CONTACTED FOR PRELIMINARY CONSULTATION**

Arun District Council
British Canoe Union
Chichester Harbour Conservancy
Council for the Protection of Rural England
Country Landowners Association
Countryside Commission
East Hampshire District Council
English Heritage
English Nature
Farming and Rural Conservation Agency (on behalf of MAFF)
Forestry Commission
Hampshire County Council
Horsham District Council
Inland Waterways Association
Mole Valley District Council
National Farmers Union
National Society for Clean Air
Portsmouth Water plc
Royal Society for the Protection of Birds
Southern Water Services
Sussex Air Quality Steering Group
Sussex Anglers Consultative Association
Sussex Area Environment Group
Sussex Downs Conservation Board
Sussex Sea Fisheries Committee
Sussex Wildlife Trust
Waverley District Council
West Sussex County Council

APPENDIX 3**TYPES OF PLAN REQUIRING ENVIRONMENT AGENCY CONSULTATION**

1. **STRUCTURE PLAN:** Statutory consultation. Provides an opportunity for the Agency's concerns and priorities to be reflected as policies and guidance at a strategic level.
2. **UNITARY DEVELOPMENT PLAN:** Statutory consultation. Provides an opportunity for the Agency's concerns and priorities to be reflected at both strategic and local level, and provides the opportunity to influence the type, location and scale of new development.
3. **LOCAL PLAN:** Statutory consultation. Provides an opportunity for the Agency's concerns and priorities to be reflected as policies and guidance at a local level and to influence type, location and scale of new development. Provides an important link to the development control process and the Agency's LEAPs.
4. **MINERALS LOCAL PLAN:** Statutory consultation. Opportunity to influence location for new mineral extraction sites, as well as policies relating to the operation and aftercare of the sites.
5. **WASTE LOCAL PLAN:** Statutory consultation. Opportunity to influence location for new waste sites, as well as policies relating to the operation and aftercare of the sites.
6. **AIR QUALITY MANAGEMENT PLAN:** Statutory consultation. To assist in identification/regulation of polluting processes.
7. **DEVELOPMENT BRIEFS:** To identify constraints on new development and requirements to protect and enhance the environment.
8. **WASTE RECYCLING PLAN:** Statutory consultation. Opportunity to influence location and management of sites.
9. **SHORELINE MANAGEMENT PLAN:** Produced on behalf of coastal bodies to ensure an agreed and co-ordinated management of coastal protection and sea defences.
10. **COASTAL ZONE MANAGEMENT PLAN:** Opportunity to address issues relevant to the Agency's interests with other organisations to ensure a co-ordinated and agreed approach to the overall management of the coastal zone.
11. **LOCAL STRATEGIES** including those for: the coast; the landscape; the countryside; environmental issues; rural areas; conservation; transportation. To influence issues relevant to the Agency
12. **NATIONAL PARK MANAGEMENT PLAN:** Statutory consultation. To consider management issues relevant to the Agency's interests.
13. **AONB MANAGEMENT PLAN:** Statutory Consultation. To consider management issues relevant to the Agency's interests.

APPENDIX 4:**DEVELOPMENTS REQUIRING ENVIRONMENT AGENCY CONSULTATION****General**

1. Development within or adjacent to any watercourse or which includes a discharge to a watercourse.
2. Development including landraising, in areas at risk of flooding from rivers including tidal lengths, and the sea.
3. Development on, under or adjacent to any flood bank, sea defence or other flood control structure.
4. Development which may affect an aquatic/wetland site of conservation interest.
5. Development of contaminated land e.g. gas works, historic industrial use, bulk fuel storage, chemical production and landfill.
6. Development involving the disposal of sewage other than to a public sewer, including the use of septic tanks, cesspits, private sewers and private sewage treatment works.
7. Development which could affect groundwater protection zones.
8. Development which could exacerbate existing sewerage or sewage disposal problems.
9. Development within 250 metres of land which is or has, at any time in the 30 years before, been used for the deposit of refuse or waste and has been notified by the Agency.
10. Development on the site of or within 500 metres (measured from site boundary) of a process subject to Integrated Pollution Control, or subject to the Control of Industrial Air Pollution (registration of Works) Regulations 1989.
11. Development involving the raising or reclamation of land.
12. Development which falls within the Environmental Assessment Regulations 1988.

Specific

13. Residential, industrial or commercial developments greater than 0.5 hectares in area or which incorporate an access road.
 14. Major infrastructure schemes e.g. highways, railways, power stations, wind farms, airports, tunnels, oil refineries, pipelines and any associated facilities.
 15. Waste management operations including landfill, waste transfer stations, incinerators, scrap yards, solvent recovery plants, baling and re-cycling plants.
 16. Mineral workings and exploratory works to include oil and gas exploration and land restoration projects.
 17. Petrol filling stations or other bulk storage facilities for petroleum products and chemicals including hazardous substances, fertilisers and pesticides (above or below ground).
 18. Vehicle parks including plant hire and transport depots.
 19. Agricultural developments to include intensive livestock and poultry units, chemical and fertiliser storage, the making and storage of silage and the storage and disposal of manure and effluents.
 20. Kennels, catteries, stables, etc.
 21. Camping and caravan sites.
 22. Timber treatment plants.
 23. Cemeteries and crematoriums.
 24. Fish farming activities, fish stocking or relocating of fish or works which will restrict the movement of fish.
 25. Water-based recreation facilities or developments affecting access to water or waterside areas.
 26. Ponds, lakes and reservoirs, including water storage for irrigation.
 27. Golf courses.
 28. Swimming pools.
 29. Forestry activities.
 30. MPG8: Planning and Compensation Act 1991: Interim Development Order permissions (IDOs) - Statutory Provisions and Procedures (1991)
 31. MPG9: Planning and Compensation Act: Interim Development Order Permissions (IDOs) - Conditions (1992)
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32. MPG10: Provision of Raw Material for the Cement Industry (1991)
 33. MPG12: Treatment of Disused Mine Openings and Availability of Information on Mined Ground (1994)
 34. MPG14: Environment Act 1995: Review of Mineral Planning Permissions (1995)
 35. DoE Circular 23/83 (WO 32/83): Caravan Sites and Control of Development Act (1969)
 36. DoE Circular 2/85 (WO 3/85): Planning Control over Oil and Gas Operations.
 37. DoE Circular 25/85 (WO 60/85): Restoration of Sites with a High Water Table.
 38. DoE Circular 15/88 (WO 23/88) Assessment of Environmental Effects Regulations, 1988.
 39. DoE Circular 14/89 (WO 23/89): Caravan Sites and Control of Development Act 1960 - Model Standards.
 40. DoE Circular 17/91 (WO 62/91): Water Industry Investment.
 41. DoE Circular 24/91 (WO 68/91): Private Water Supplies
 42. DoE Circular 29/92 (WO 61/92): indicative Forestry Strategies.
 43. DoE Circular 30/92 (WO 68/92): Development and Flood Risk.
 44. DoE Circular 4.93 (WO 8/93): Environmental Protection Regulations.
 45. DoE Circular 11/94 (WO 26/94): Environmental Protection Act 1990: Part II Waste Management Licensing - the Framework Directive on Waste.
 46. DoE Circular 9/95 (WO 29/95): General Development Order Consolidation 1995.
 47. DoE Circular 11/95 9 WO 35/95): Use of Conditions.
 48. EC Protection of the Quality of Groundwater Directive 80/68/EEC.

Note: WO refers to a Welsh Office Circular.

APPENDIX 5:**FURTHER INFORMATION**

Further information may be obtained from the following publications which have been produced by the Environment Agency:

An Environmental Strategy for the Millennium and Beyond. Bristol, 1997

Environment Agency Corporate Plan 1998-99. Our Forward Look to 2000-02. Bristol, 1998

Fishing in the South. Southern Region, Worthing.

Guidance for the Control of Invasive Plants near Watercourses. Bristol.

Money for nothing - your waste tips for free. Bristol, 1998.

Policy and Practice for the Protection of Floodplains. Bristol, 1997

Policy and Practice for the Protection of Groundwater. Bristol, 1998

Progress in Water Supply Planning. The Environment Agency's Review of Water Company Water Resource Plans. Bristol, 1998

Saving Water: On the Right Track. Bristol, 1998

Saving Water: Taking Action. Bristol, 1998

Sustaining Our Resources. Southern Region. Worthing, 1997

The Agency's Contribution to Sustainable Development. Bristol, 1997

Viewpoints on the Environment. Bristol, 1997

Waste Minimisation and Waste Management. Bristol, 1997

Water Related Recreation Strategy for the Southern Region. Consultation Draft. Southern Region/English Sports Council. Worthing, 1997

GLOSSARY

Abstraction	Removal of water from surface water or groundwater, usually by pumping.
Abstraction Licence	Licence issued by the Environment Agency under Section 38 of the Water Resources Act 1991 to permit water to be abstracted.
Anadromous	Fish with a life history which involves growing and maturing in the sea but returning to freshwater to spawn.
Anticline	A geological ridge or fold.
Above Ordnance Datum	Height above mean sea level (Ordnance Survey)
Abstraction Licence	Licence issued by the Environment Agency under Section 38 of the Water Resources Act 1991 to permit water to be abstracted.
Asset Management Plan	Asset Management Plans can be considered as the means by which the water undertakers plan the work required and the capital expenditure necessary, for improvements and maintenance of the water supply, sewage treatment works and sewerage systems. These are drawn up through consultations with the Agency and other bodies to cover a five year period. Asset Management Plans must be agreed by the Department of the Environment Transport and Regions, and OFWAT.
Aquifer	A layer of underground porous rock which contains water and allows water to flow through it.
Area of Outstanding Natural Beauty	Areas of Outstanding Natural Beauty are designated under the National Parks and Access to the Countryside Act 1949 by the Countryside Commission. Their primary purpose is to conserve natural beauty.
Biochemical Oxygen Demand	A measure of the amount of oxygen in water during the breakdown of organic matter.
Biodiversity Action Plan	Nationally, a Biodiversity Action Plan (BAP) was produced in 1995 by the UK Biodiversity Steering Group as part of the Government's commitment to conserving biodiversity made at the "Earth Summit" in Rio de Janeiro. The plan contains costed targets and proposed actions for over 100 species and 14 habitats. Local Biodiversity Action Plans have now been produced at a county level (e.g. the Sussex BAP) which focus upon the habitats and species plans listed in the national BAP, relevant to that particular area.
Catchment	The total area of land which contributes surface water to a specified watercourse or water body.
Coastal Protection	Natural or man-made features protecting land over 5m AOD contour

Combined Sewer Overflow	An overflow structure which allows discharge from the sewerage system to a watercourse during wet weather conditions.
Controlled Waters	Defined by the Water Resources Act 1991 Section 104. They included groundwaters, inland waters and estuaries.
Cumecs	Cubic metres per second.
Cyprinid	Family: <i>Cyprinidae</i> . Coarse fish belonging to the carp family.
Discharge Consent	A statutory consent issued by the Environment Agency under Schedule 10 of the Water Resources Act 1991 to indicate any limits and conditions on the discharge of an effluent to a controlled water.
Dissolved Oxygen	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 a water. It is used to classify waters.
Dry Weather Flow	Average daily flow in dry weather including trade effluent and an allowance for infiltration, in litres per day.
Effective Rainfall	The rain remaining after losses by evaporation and transpiration have been allowed for.
Environmentally Sensitive Area	Area designated under law as being particularly desirable to conserve, protect or enhance, for example by the adoption of particular agricultural methods.
Eutrophication	The enrichment of waters by inorganic plant nutrients. Normally referred to when nutrient enrichment arises from human actions e.g. from agricultural run-off or from sewage effluent
Floodplain	This includes all land adjacent to a watercourse and the sea over which water flows or would flow, but for flood defences, in times of flood.
Fly Tipping	The unregulated and, hence, illegal, dumping of waste.
General Quality Assessment	A scheme which identifies sets of standards for the consistent measurement of water quality irrespective of uses applying to a river stretch.
Green Belt	A zone of designated countryside immediately adjacent to a town or city, defined in development plans for the purpose of restricting outward expansion of urban areas, and preventing coalescence of settlements.
Groundwater	Water which is contained in underground rocks (aquifers).
Greenhouse Gas	Natural and man-made gases which influence the greenhouse effect. Gases include carbon dioxide, methane, ozone and chlorofluorocarbons.

Global warming	The rise in the temperature of the globe due to the effects of greenhouse gases which cause the greenhouse effect.
Habitat Action Plan	Conservation Action Plans for specific habitats as documented in both national and local Biodiversity Action Plans.
Heritage Coast	Stretches of the most undeveloped coastline, designated by the Countryside Commission, in order to protect and conserve the coast's vulnerable beauty, and enhance people's enjoyment of the coast without risking its conservation.
High Natural Dispersion Area	Coastal or estuarine areas which have been identified by the DETR as having high natural dispersion characteristics.
Hydrograph	The graph of groundwater levels, river levels, or river flow.
Internal Drainage Boards	Autonomous public bodies under the control of board members (including those elected by agricultural ratepayers and those nominated by local authorities), with responsibilities and powers for flood defence on ordinary watercourses (non-Main Rivers) under the Land Drainage Act.
Landfill Tax	A levy per tonne or cubic metre of waste sent to landfill, used to encourage the use of recycling and waste minimisation.
Local Nature Reserve	Areas of local conservation importance as designated by Local Authorities (and in consultation with English Nature) under section 21 of the National Parks and Access to the Countryside Act 1949.
Macroinvertebrate	Animals lacking a backbone which are retained on a 0.5mm sieve.
Main River	All watercourses are designated as either 'Main River' (defined in maps held by the EA and MAFF) or 'ordinary watercourses' ('non-Main River'). Main Rivers include all watercourses which contribute significantly to catchment drainage, although ordinary watercourses may be significant locally. The EA has powers to carry out works to protect land and property from flooding by improving drainage of Main Rivers only, under the Water Resources Act 1991. Local authorities (and in some areas Internal Drainage Boards) have powers for flood defences on ordinary watercourses, and the EA has a supervisory role.
Mld	Megalitres (million litres) per day.
µg/l	Microgrammes per litre.
mg/l	Milligrams per litre.

National Nature Reserve	An area of land designated by English Nature under Section 35 of the Wildlife and Countryside Act 1981. They are managed by, or on behalf of, English Nature specifically for nature conservation purposes.
Nitrate Vulnerable Zones	Areas containing waters which are particularly susceptible to nitrate pollution, as designated under the EU Nitrates Directive .
PM ₁₀	Particulate matter smaller than 10 microns in diameter.
Potable Water	Water of suitable quality for drinking.
Prescribed Flow Condition	A condition attached to an abstraction licence such that if the river flow is less than a given flow, abstraction must cease until flows are restored.
Ramsar Sites	Internationally important wetland sites adopted from the Ramsar Convention on Wetlands of International Importance especially as waterfowl habitats (1971) and ratified by the UK government in 1976.
Return Period	The return period of a flood. Flood events are described in terms of the frequency at which, on average, a certain severity of flood is exceeded. This is usually expressed as a return period in years, e.g. 1 in 100 years.
Riparian Owner	A person or organisation with property rights on a river bank.
River Corridor	Land which has visual, physical or ecological links to a watercourse and which is dependent on the quality or level of the water within the channel.
River Quality Objective	The level of water quality that a river should achieve in order to be suitable for its agreed uses.
Salmonid	Family: <i>Salmonidae</i> . Game fish including salmon, sea trout and trout.
Sea Defences	Natural or man-made features protecting land below 5m AOD contour.
Shoreline Management Plan	Locally initiated by the South Downs Coastal Group for the Shoreline from Selsey Bill to Beachy Head, with the main option to hold the line. Will continue to evolve as strategies are developed through consultation with specialists and local people.
Site of Nature Conservation	Site of local nature conservation importance as Importance designated by Local Authorities for planning purposes
Site of Special Scientific Interest	A site given statutory designation and protection by English Nature because it is particularly important, on account of its nature conservation value under the Wildlife and Countryside Act 1981 as amended.

Special Area for Conservation	Internationally important nature conservation site designated under the EU Habitats Directive (92/43/EEC). All SAC's are also SSSIs.
Special Protection Area	Internationally important nature conservation site designated under the EU Wild Birds Directive (79/409/EEC). All SPA's are also SSSIs.
Species Action Plans	Conservation Action Plans for specific species, as documented in both national and local Biodiversity Action Plans
Statutory Water Quality Objectives	Water Quality objectives set by the Secretary of State for the Environment, in relation to controlled waters.
Strata	Layers of rock, including unconsolidated materials such as sands and gravel.
Sustainable development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs' (definition from World Commission on Environment and Development, 1987. Our Common Future - The Brundtland Report).

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

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0645 333 111

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

ENVIRONMENT AGENCY EMERGENCY HOTLINE

0800 80 70 60



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