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NORTH SOMERSET RIVERS

ACTION PLAN

NOVEMBER 1998



ENVIRONMENT
AGENCY

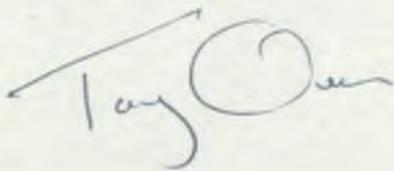
Foreword

The Environment Agency is a major environmental protection organisation responsible for regulating waste disposal to land, industrial releases to air, and safeguarding and improving the natural water environment. Our aim of integrated environmental improvement in North Somerset contributes to the achievement of global sustainability in accordance with the spirit of the 1992 Rio de Janeiro 'Earth Summit' agreement.

The catchment of the North Somerset Rivers includes the seaside resorts of Weston-super-Mare and Clevedon, a major development at Portbury as well as the North Somerset Levels and Moors which are nationally important for nature conservation.

This Action Plan is the second stage in the LEAP planning process for the area, following on from the Consultation Report which was published in December 1997. The Action Plan is the Agency's commitment to the integrated and sustainable environmental management of the North Somerset Rivers area and sets out an agreed programme of action to be carried out over the next five years. Other solutions will be looked at in a longer term perspective over a wider area.

We are grateful for the responses to our consultation. The spirit of partnership needed to implement this plan is represented by the valuable contributions received from local authorities, environmental and interest groups as well as the public. This partnership will ensure that all who care for the environment can work better together to enhance the area.



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ENVIRONMENT AGENCY



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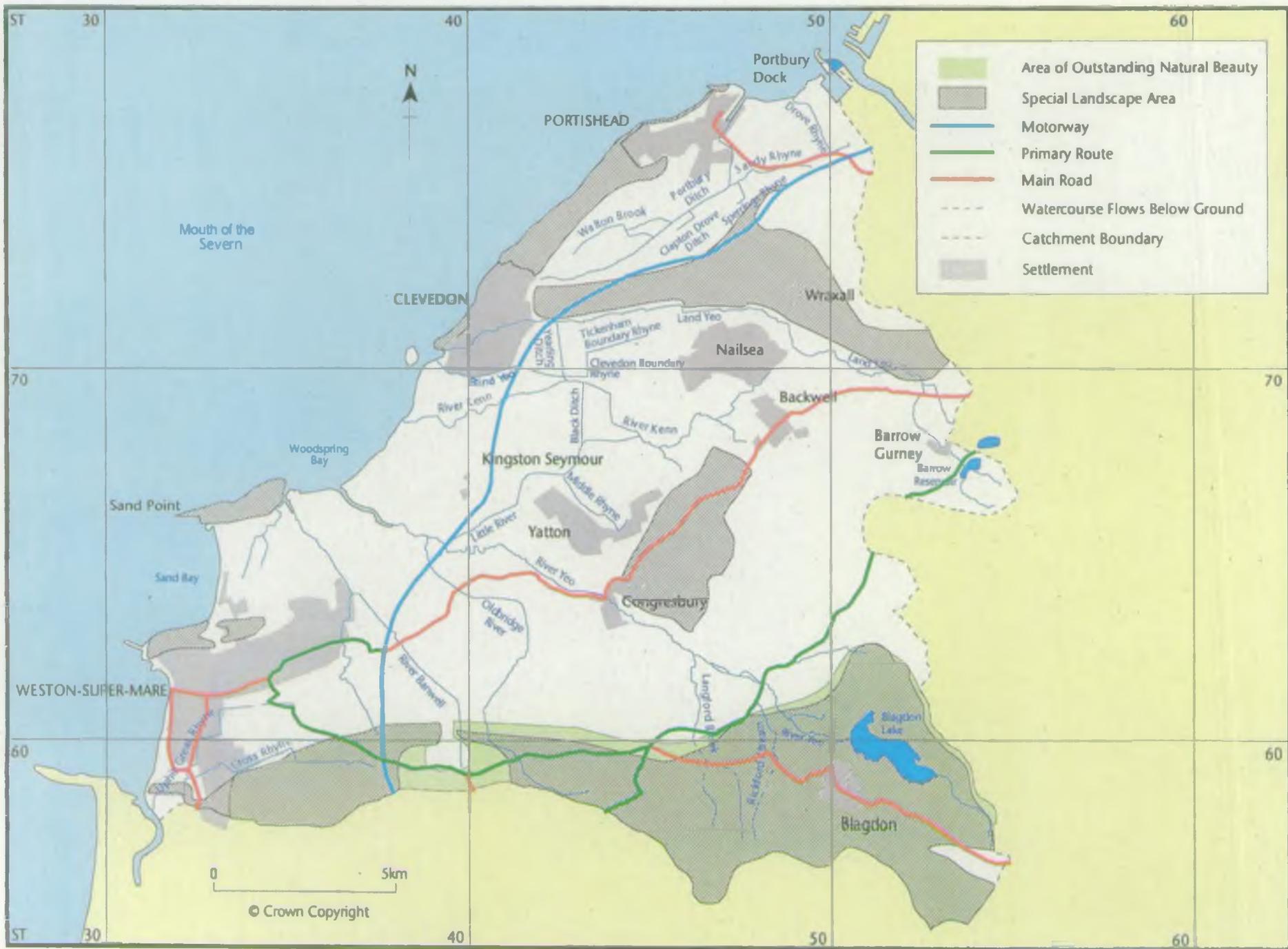
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Note: This is not a legally or scientifically binding document.

Map 1 - North Somerset Rivers Catchment



map 1

Fold out for Map 1
North Somerset Rivers Catchment

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Map 2	Compliance with River Quality Objectives	Fold out to back

1. The Environment Agency

Our vision:

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

1.1

Our aims

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

We will do this by:

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

2. Introduction

The Environment Agency was set up by the Government in 1996. It has a wide range of duties and powers relating to different aspects of environmental management (see Appendix 12.6 for more detail). It 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'*.

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. The Agency therefore has to reflect this in the way it works and in the decisions it makes.

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.

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 achieve agreed objectives.

Much of the UK's environmental legislation originates from the European Union. To date there have been five European Community (EC) Environmental Action Programmes which have collectively given rise to several hundred pieces of legislation of relevance to environmental protection, one of the most recent being the Directive on Integrated Pollution Prevention and Control. A number of other directives are currently under consideration, covering issues such as water management, air quality, and the management of waste using landfill.

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.

Perhaps the major international issue is that of climate change. The UK is a contributor to the emission into the atmosphere of gases, such as carbon dioxide, 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 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.

Another outcome 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. 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.

The Agency is committed to a programme of Local Environment Agency Plans (LEAPs) in order to produce a local agenda of integrated action for environmental improvement. These LEAPs will also allow the Agency to deploy its resources to best effect and optimise benefit for the local environment.

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

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

Nationally we will have published a Consultation Report for all plan areas in England and Wales by the end of 1999. In the North Wessex Area we have completed consultation on four plans out of six, have started implementing two LEAP Action Plans, and have also contributed to the Severn Estuary Joint Issues Report which was published in May 1997.

2.1 Public Consultation

In December 1997 the Agency published the North Somerset Rivers Local Environment Agency Plan (LEAP) Consultation Report, which promised an Action Plan for the catchment following a period of Public Consultation. The Agency consulted approximately 300 organisations and individuals directly about the issues which are outlined in this Action Plan and received 53 formal responses. These responses are summarised in our Report on Public Consultation available on request from this office. A list of organisations responding to the Consultation Report can be found in Section 12.4.

This Action Plan outlines how the Environment Agency and other organisations plan to tackle issues which affect the environment in the North Somerset Rivers Catchment. Issues are grouped and summarised under the headings of the Agency's nine principal and immediate environmental concerns.

We have set up a LEAP Steering Group to help us produce this Action Plan. The membership of individuals and organisations reflects as many interests in the catchment as possible. A list of members and the interests they represent can be found in Section 12.3.

2.2 Updating and reviewing this plan

We will publish an Annual Review to report progress on carrying out our planned actions. This will also be an opportunity to add new issues and actions as they may arise.

2.3 LEAPs and Development Plans

Although we can control some of the things which influence the quality of the environment or affect flood risk, we have very little direct control over the way that land is developed. This is the responsibility of local planning authorities. Local planning authorities prepare statutory development plans. The policies in these plans will guide the way that land is developed in the future.

Guidance has been published and will soon be updated for local planning authorities to encourage them to adopt policies that protect the environment from the harmful effects of development. Where we can, we will reinforce these policies when we comment on planning matters or if we are making our own decisions. The Agency will also advise planning authorities on planning matters related to industrial processes, sewage disposal, water resources for public supply, waste management and the storage, use and disposal of radioactive material.

This Action Plan highlights our concerns about development. The Environment Agency is in detailed discussions with local planning authorities with respect to provision of land allocations in Local Development Plans for their Plan period up to 2011.

2.4 Protection through partnership

The Agency works in partnership with many organisations and individuals concerned with the protection and enhancement of the environment. In the UK as a whole much has been achieved already, but much more is possible by working closely with others. The Agency is essentially a regulatory body and does not give grants, so to achieve some of its aims it must co-operate with others such as the local authorities and Ministry of Agriculture, Fisheries and Food (MAFF) to harness their financial resources and technical expertise. The Agency can also work towards its objectives by working with voluntary groups such as the local wildlife trusts and recreational associations. In some cases partnerships are already well established with other statutory bodies, especially where there is joint responsibility, such as the North Somerset Levels and Moors Project - a partnership between North Somerset Council, English Nature, the (Avon) Wildlife Trust, the Agency and local landowners - or the Water Level Management Plans produced by the Internal Drainage Boards with contributions from the Agency.

This section outlines some of these partnerships and indicates opportunities for further development.

- 2.4.1 **Links with local authorities** – We advise the local planning authorities on the impact of proposed development, together with our requirements for environmental protection. We also work with the local planning authorities to ensure that suitable policies to protect and enhance the environment are incorporated within Local Development Plans, land drainage, flood warning procedures, oil pollution plans and emergency plans.
- 2.4.2 **Air quality** – The Agency and local authorities are both responsible for aspects of air quality monitoring and management, although local authorities are responsible for producing and implementing Local Air Quality Management Plans. We will build partnerships to develop and implement Local Air Quality Management Plans.
- 2.4.3 **Amenity and recreation initiatives** – The Agency supports many of the recreation initiatives being developed by North Somerset Council in conjunction with landowners. The Agency owns some significant areas of land alongside rivers within the catchment. Of particular interest is the Blind Yeo at Clevedon, where the Agency is producing, with North Somerset Council and Agency tenants, a Conservation and Recreation Management Plan to enhance the river corridor. The plan is intended to improve landscaping, recreation opportunities

and riverside amenity. As part of such plans, nature conservation can be furthered by creating wildlife habitats.

- 2.4.4** **Litter** – The Agency has no powers or resources to clear litter in and around rivers, unless it could cause an obstruction to flood flows.
- 2.4.5** **Local Agenda 21** – Across the catchment, all local authorities are assisting their local communities in developing local strategies and action plans for sustainable development. The approach adopted varies from district to district, with many Local Agenda 21 groups setting up working groups looking at specific issues. We are currently considering how we can be most effective in assisting local communities in developing their Local Agenda 21 plans.
- 2.4.6** **Shoreline Management Plans (SMPs)** – SMPs are being produced by a range of groups with statutory interests working together. They provide a forum for an integrated review of coastal processes and develop sustainable coastal defence policies to set objectives for the future management of the shoreline. The SMP that includes the coast within this LEAP is called the Severn Estuary SMP.
- 2.4.7** **Working with businesses** – We are working in partnership with local businesses to promote pollution prevention and waste minimisation. Examples include:
- our '3 Es' campaign (Emissions, Efficiency, Economic\$) which aims to reduce waste, packaging, effluent and energy use and thereby both help the environment and save the business money;
 - farm waste management plans developed with farmers and the Farming and Rural Conservation Agency (FRCA);
 - our oil care campaign;
 - our training video for construction workers;
 - our work with the Farming and Wildlife Advisory Group (FWAG) to promote environmentally friendly farming practices.
- 2.4.8** **Conservation** – Within North Somerset Levels and Moors Project area, the Agency, North Somerset Council, the Wildlife Trust and English Nature are working in partnership with local farmers and community groups to raise public awareness and promote environmental improvement schemes to enhance the value of these levels.

Within low-lying areas, the Agency and English Nature are working in partnership with Internal Drainage Boards to produce Water Level Management Plans. We undertake species survey work with English Nature, the Wildlife Trust, Bristol Regional Environmental Records Centre and the Hawk and Owl Trust.

The key issues affecting the conservation value of the catchment are: land-use change, in particular development within the Levels and Moors and coastal areas; water abstraction and increases in the demand for water for public and private use; the impact of river maintenance works; and water quality problems associated with agricultural and urban runoff, penning water levels and nutrient enrichment.

There are some significant opportunities for conservation and recreation benefits on Agency-owned land (within the North Somerset Levels and Moors Project) and through works with North Somerset Council, English Nature, the Wildlife Trust, recreation organisations, landowners and local communities.

2.4.9

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. In particular, there is a need to:

- educate young people to equip them to make informed judgements about future environmental decisions;
- educate industry through consultation, collaborative activities and targeted campaigns to promote a culture of prevention rather than cure;
- raise public awareness of environmental issues to engender in society a common ownership of the environment and its challenges.

Currently, we provide a wide range of information to all sectors of society, and in addition give many talks and presentations. The Agency has recently published a leaflet entitled 'Green shoots: Our vision for Environmental Education'.

Promoting these LEAPs raises awareness of environmental issues with the local community.

Each LEAP is guided by a Steering Group whose members are drawn from our key customers locally and include: English Nature; Country Landowners Association; National Farmers Union; Internal Drainage Boards; local authorities; industry; waste management companies; Wildlife Trusts; fisheries interest; British Canoe Union and water companies.

We run a 24-hour service for receiving reports of, and responding to, flooding and pollution incidents and emergencies in the air, water and on land. Our Pollution Hotline Number is 0800 80 70 60.

2.5

The Agency's own Environmental Management

The Agency is committed to the following environmental management practices.

2.5.1

Resources – We ensure the allocation of resources at all levels to achieve the implementation of effective environmental management action throughout the Environment Agency and make our line-managers responsible for the achievement of objectives and performance targets.

2.5.2

Targets – We support continuous environmental improvement by the establishment of demanding but achievable and measurable environmental performance targets determined and reviewed annually.

These targets cover aspects of energy and resource use, waste minimisation and recycling.

Our current national targets are set out in the table opposite.

Draft Environmental Performance Targets 1998/99

Target No	Target	Completion Date
Legislative Compliance		
1	Continue to ensure full compliance of all Agency sites with all relevant environmental legislation by undertaking a second round of DIY reviews and reporting, investigating and rectifying all environmental incidents caused by our own activities.	Review within first anniversary of inspection, reporting by 30 November 1998.
Energy Management		
2	Reduce energy use in offices and depots by 20% measured as kWh/m ² compared to Energy Efficiency Office typical, or 1991/92 consumption, whichever is lower (see 3.1.2).	31 March 1999.
3	Compile 'Green Transport Plans' to reduce commuter transport impacts at all key sites and to reduce mileage on Agency business (lease, badged, casual, essential, etc.) by 5% on 1996/97 figures (see 3.1.1).	Plans by 30 November 1998; Mileage by 31 March 1999.
4	Improve overall fuel efficiency for badged vehicle fleet by 3 mpg on 1996/97 figures (see 3.1.1).	31 March 1999.
Resource Management		
	Implement resource and waste management plans at each Agency site. Specifically to:	
5	● reduce water use in offices and depots to 30% below accepted norm for office type or 1996/97 consumption, whichever is higher;	Water by 30 September 1998.
6	● reduce residual waste by 15% on 1997/98 levels.	Waste by 31 March 1999.
7	Ensure that at least 10% of construction aggregates used are from recycled/secondary sources.	31 March 1999.

2.6 The North Somerset Rivers Catchment

This LEAP Plan Area starts at Brean Down in the south and extends east to just beyond Blagdon Lake and then north to the mouth of the Avon.

The greater part of the population of 178,000 (1991 census) is concentrated in the coastal towns of Weston-super-Mare (64,935), Clevedon (21,670) and Portishead (14,721). Inland, the larger settlements are Nailsea (17,230), Yatton (6,826) and Congresbury (3,435).

The Plan Area combines the catchment of the Rivers Banwell, Oldbridge, Yeo, Kenn, Blind Yeo and Land Yeo, as well as the Uphill Great Rhyne, the Drove Rhyne and the Portbury Ditch.

The rivers in the Plan Area are characterised by having short upland reaches and long lowland reaches with very low gradients. The lower reaches are penned (see Section 8.2) to maintain certain levels of water, mainly for agricultural benefit - often resulting in water quality problems.

Approximately one third of the Plan Area is potentially floodable, relying on engineered defences for flood alleviation (see 9.1). Nearly half the Plan Area is low-lying levels and moors where water is managed by three Internal Drainage Boards (see 8.2): the Gordano Valley, North Somerset and West Mendip Internal Drainage Boards.

The North Somerset Levels and Moors support some nationally important areas of high nature conservation value including one National Nature Reserve - Gordano Valley.

There are twenty-five Sites of Special Scientific Interest (SSSIs), a number of which contain important wetland habitats and large areas of open water. There are forty-six sites designated as Sites of Nature Conservation Interest (SNICIs) within the catchment which are dependent on, or are influenced by, the water environment. These are protected by both Structure Plan and Local Plan policies.

The catchment also contains a large number of Scheduled Ancient Monuments, particularly across the Mendip Hills. However, there is considerable archaeological interest along the coast strip and through the Levels and Moors.

The majority of the catchment is agricultural land - predominantly cattle farming. Tourism is particularly important in the area and is concentrated in the seaside resorts of Weston-super-Mare, Clevedon and Portishead. North Somerset Council are hoping to develop inland tourism, including increased provision for walking and cycling.

2.7

About this plan

The topic chapters which follow outline actions for resolving the issues identified in the North Somerset Rivers LEAP Consultation Report and through the public consultation. This Action Plan is structured around the Agency's nine environmental themes (see 'An Environmental Strategy for the Millennium and Beyond'), which aim to protect and enhance the environment in an integrated way and contribute towards the goal of sustainable development.

In this plan some environmental matters which are of concern to us are dealt with adequately by our routine work and so no specific actions are included. Specific actions are only included where we do not consider our routine work is sufficient to resolve a problem.

For a full discussion of the issues please refer to the North Somerset Rivers Consultation Report Section 4. The costs identified represent our planned expenditure over the next five years. However, our policy and priorities may change during this time; this may affect how much we will actually be able to spend on specific issues. Coastal issues are covered in the Severn Estuary Strategy Joint Issues Report, May 1998.

The financial years covered by this Plan are represented by a single date: for example, '98' represents the financial year April 1998 to March 1999. Where costs are shown by a '-' it means that the costs have already been accounted for in association with another action covered elsewhere in the plan.

3. Climate Change

The climate has always been changing, but the rate of change appears to be increasing in recent years. There is a broad consensus of scientific opinion that such changes are occurring because of the impact of human activities on the global atmosphere.

It is now generally accepted in Europe that there is a high risk that some chemical emissions to the atmosphere may have a significant impact on the global environment. Emissions of a range of gases, notably carbon dioxide and methane, are adding to the natural 'greenhouse' effect which may cause global warming. Estimated emissions of carbon dioxide nationally, from large industrial processes and other sources in the UK, in 1990 reached 155 million tonnes. The international community is trying to get the major industrialised countries to sign up to achieving reductions of these 'greenhouse' gases. Currently Britain is committed to reducing emissions to 1990 levels.

It is estimated that because of global warming sea levels world-wide will rise by more than 500 mm in the next 100 years, although the present rate is probably about 2 mm per year in the Severn Estuary. With a rise of, say, 3 mm per year, tide levels which have a statistical probability of occurring once every 200 years on average at Avonmouth will be twice as frequent (once in 100 years) by 2006 and twice as frequent again (once in 50 years) by 2016. The Environment Agency uses these probabilities to design target standards for different land uses. Hence, a scheme designed to meet the standard of protection for high-density urban development would, by 2016, only meet that appropriate for rural communities, if additional action was not taken. The improvement of defences will take place within the strategic framework of Shoreline Management Plans.

In addition, some scientists believe that storms will become more frequent and more violent as a result of global warming, although this effect has not yet been confirmed. Storms can raise sea levels above predicted levels and generate increased wave action, causing overtopping and increased erosion of existing defences.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 8 climate change actions, 3 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 help to ensure that the Government's greenhouse gas emission reduction targets are met;
- 2 set an example by reducing our own energy and fossil fuel consumption;
- 3 provide improved mapping of low-lying coastal areas at risk from sea-level changes. (Responsibility for coastal defence is shared between the Agency, local authorities and, in a few cases, private companies e.g. Railtrack).

To help with point 1 we are reducing emissions to air from the most complex industrial processes within the catchment (see Section 4). The Environment Agency is responsible for authorising and regulating emissions to air from these processes, fossil fuel powered electricity generating stations, refineries, steel and chemical works, cement and lime production and waste incineration. Local authorities are responsible for emissions from the rest of industry and for reducing emissions from vehicles. A National Atmospheric Emissions Inventory is prepared each year for the Department of the Environment, Transport and the Regions (DETR) by the National Environmental Technology Centre (NETCEN). Emissions to air of greenhouse gases from these complex processes within this catchment are minimal.

Another source of greenhouse gases is landfill. With the decay of putrescible wastes in landfills, a mixture of gases generally known as landfill gas is produced. In the early years of decay carbon dioxide (CO₂) is the main contributor to landfill gas and its emission to the atmosphere. As available oxygen is used up within the landfill methane (CH₄) gas is produced and becomes the main contributor. Both carbon dioxide and methane are greenhouse gases; however, methane is estimated to be 20-30 times more damaging than carbon dioxide. Therefore conversion of methane to carbon dioxide is less damaging to the environment than allowing the landfill gas mixture to be discharged to the atmosphere unchanged.

The combustion of gas, either in flares or as part of an energy recovery, converts methane to carbon dioxide, and should be undertaken whenever the landfill gas yield is capable of supporting combustion. Only sites that are taking or have taken large quantities of biodegradable wastes may be able to support combustion in some form or another.

Landfill gas management is also practised to:

- minimise the risk of migration or accumulation off-site;
- eliminate so far as possible the risk of explosion or asphyxiation;
- prevent unacceptable risk to human health, detriment to the environment or nuisance.

Only when landfill gas is confined in enclosed spaces or trapped in soil voids do these risks exist.

It is only landfill sites capable of producing large amounts of landfill gas that pose the above risks. Consequently, through the positive extraction and combustion of landfill gas the risks highlighted above and the impact on climate change are reduced.

Our North Wessex Area Waste Licensing team is currently reassessing the adequacy of the pollution prevention controls upon waste management facilities in the area. This review covers the full range of licensed facilities, including landfill sites. This work will prioritise for attention those facilities requiring upgraded controls, allocating resources appropriately. Prioritisation will be made on the basis of three criteria:

- (i) risk of pollution of the environment and harm to human health;
- (ii) sensitivity of the locality and risk of serious detriment to its amenities; and
- (iii) enforceability of conditions to ensure modern standards of control.

This review will include the need for existing and new sites to introduce or upgrade their landfill gas systems.

The following table outlines the licensed active and closed sites in the North Somerset Rivers Catchment which have the potential to produce landfill gas, or are currently producing it. The table also identifies what measures are appropriate to deal with the gas.

Site No.	Name	Location	Status	NGR	P* F* E*	Comments
50.2	R W Fowler	Weston Drove, Weston in Gordano	Active	ST 448 738	●	Site nearly complete. Low gas levels (requires verification). Adjoins other licensed sites in same ownership.
151.1	R W Fowler	Weston Drove, Weston in Gordano	Active	ST 447 737	●	Site nearly complete, low gas levels (requires verification). Adjoins other licensed sites in same ownership.
191.1	I C Rendall	Rust Bridge, Kenn, Clevedon	Active	ST 410 686	●	Small site in isolated location. Insufficient biodegradable waste is present in the deposited fill to justify any action at present.
321	R W Fowler	Weston Drove, Weston in Gordano	Active	ST 447 737	●	Small inert waste site located within two other licensed facilities in same ownership. Gas levels on this site also require verification as it forms a continuum with the others.
287.1	North Somerset Council	Civic Amenity Site, Cheston Combé, Backwell	Active	ST 494 680	●	This refuse amenity site is situated on an old ex-local authority landfill site. Currently landfill gas is passively vented, and there is a need for the amounts and the concentrations to be verified.
317	North Somerset Council	Hutton Moor, Weston-super- Mare	Golf course construction on former landfill site	ST 340 609	●	The current constructional activities are at present registered as exempt from the need for a licence. However, they are situated on a gassing, unlicensed local authority landfill site. As part of the construction works, remedial action to control and flare landfill gas is likely to be necessary. These matters are now under discussion with the local authority and the developer.

* Key - P = Passive, F = Flared, E = Energy production

In addition the current exempt golf course constructional activities which are taking place on the former Local Authority landfill site at Hutton Moor, Weston-super-Mare, will also be reviewed because of its ongoing environmental significance.

Our response to point 2 is that we have set targets to reduce our own energy and fossil fuel consumption. The burning of fossil fuels to produce electricity, as well as directly for energy, produces greenhouse gases. By reducing business mileage we reduce the greenhouse gas emissions from our vehicle exhausts. In addition we have appointed a Regional Officer to co-ordinate our internal environmental management.

Within the North Wessex Area, our targets are to reduce electricity consumption in our offices and depots by 20% compared to Energy Efficiency Office (EEO) typical or 1991/92 consumption, whichever is lower; and to reduce business mileage by 3 mpg compared to our 1996/97 figures; both by 31 March 1999. We are currently drawing up an Action Plan for internal environmental management. Most of our electricity consumption is for pumping stations, some of which are based in this catchment.

The maps referred to in point 3 are known as 'Section 105 maps'. The standard used is a flood which has a statistical probability of happening once in 200 years. As required by the Ministry of Agriculture, Fisheries and Food (MAFF) and the Welsh Office we build into that prediction an allowance of 5 mm per year, up to 2030, for sea level rise resulting from climate change.

The coastal Levels are slightly higher, at approximately 6 m OD, than the inland peat Moors (4 m OD on average) and so are less likely to suffer river flooding. However, the Levels are generally below the High Water Spring Tide level (approximately 8 m OD) and so are threatened by tidal flooding. Within this catchment there is only one sea defence scheme planned. This is programmed for post 2003/04, but it should be noted that the timing of Environment Agency schemes is reviewed twice a year and is dependent upon available funding and relative priorities.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
3.1.1 Reduce Agency North Wessex area business mileage (see 2.5.2) by 5% and our overall fuel efficiency by 3 mpg on our 1996/97 figures.	Agency	Unknown	●	●			
3.1.2 Reduce Agency North Wessex electricity consumption in our offices and depots by 20% compared to EEO typical, or 1991/92 consumption whichever is lower.	Agency	Unknown		●			
3.1.3 Reduce methane emissions from landfills as part of a review of landfill site licences.	Agency	Unknown	●	●			
3.1.4 Ensure Hurditches Sea Defence is constructed to latest standard incorporating a sea level rise allowance.	Agency	620					

4. Air Quality

In March 1997 the Government published a national strategy for air quality including: a framework of standards and objectives for the pollutants of most concern; a timetable for achieving objectives; and the steps the Government is taking and the measures it expects others to take to see that objectives are met.

We will be working closely with local authorities to help achieve the objectives of the National Air Quality Strategy, principally through our regulation of emissions to air from controlled ('Part A') major industrial processes under Integrated Pollution Control (IPC) (see Summary of North Somerset Council Air Quality Monitoring Results). Local authorities are responsible for the regulation of smaller, less complex ('Part B') industrial processes and for reducing traffic pollution.

In due course air quality standards may be prescribed in regulations made by the Government and obligations placed on local authorities regarding the establishment and operation of local air quality management areas. Local authorities will have to carry out periodic reviews of air quality in their areas. Where standards are not being met or are not likely to be met by 2005 they will make action plans to improve air quality in these areas. Local authorities have the major responsibility for managing air quality. This work is in its infancy and very few data exist at present, but the data collection process is now gathering momentum.

Ambient concentrations of smoke and sulphur dioxide have generally declined in the UK as a whole over the last twenty years. Similarly, both the quantity of lead released and its concentration in the atmosphere have declined since the mid-1980s following the introduction of lead-free petrol. However, the release of some pollutants such as nitrogen oxides, carbon monoxide and volatile organic compounds has remained relatively stable during this period, although there may have been changes in their sources. For example, releases of oxides of nitrogen from industrial sources have generally declined whilst emissions from road traffic, particularly at busy motorway junctions, have increased. Planned development in the catchment will lead to an increase in vehicle movement, therefore increasing the amount of polluting discharges, especially oxides of nitrogen. With the exception of ground level ozone, ambient levels of these pollutants are generally lower in the South West of England than in many other parts of England and Wales.

Ozone in the upper atmosphere shields the earth from harmful UV radiation. At ground level, however, ozone can be a harmful pollutant damaging crops and building materials and causing respiratory difficulties amongst sensitive people. Ozone is not emitted directly from any man-made source in any significant quantities, but arises from complicated chemical reactions in the atmosphere driven by sunlight. In these reactions, oxides of nitrogen and hydrocarbons (derived mainly from vehicle exhausts) react in the atmosphere to produce ozone. These chemical reactions do not take place instantaneously, but over several hours or even days, and once ozone is produced it may persist for several days. In consequence, ozone produced at one site may be carried for considerable distances in the air, and maximum concentrations usually occur away from the source of the primary pollutants. The highest concentrations of ozone generally occur during hot, sunny and relatively windless days in summer.

In common with other parts of Southern England, ozone levels in the catchment are generally above those at which damage to vegetation may occur. The Expert Panel of Air Quality Standards (EPAQS) recommend an Air Quality Standard for ozone in the UK of 50 parts per billion (ppb) as a running 8-hour average, whilst the World Health Organisation recommends a vegetation growing season guideline mean of 30 ppb.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 5 air quality actions, all of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 help the government deliver its Air Quality Strategy;
- 2 ensure emissions from the major industrial processes to the atmosphere are reduced;
- 3 ensure specific emissions of sulphur dioxide and oxides of nitrogen, which contribute to acid rain, are reduced;
- 4 discourage the use of solvents in industry, which contribute to the production of ozone, the major photochemical pollutant;
- 5 set an example in reducing emissions from vehicles by reducing our own mileage and increasing the use of public transport.

We will help achieve the targets of the National Air Quality Strategy in a number of ways: for example we will work with local authorities, government agencies, and developers to ensure that developments make use of transport options producing the least pollutants and that development is located where it will have the least detrimental impact on air quality. The Government is soon to publish the National Transport Strategy which will have an important bearing on this issue.

There are three IPC sites in the catchment operating cadmium electroplating, from which the main releases to air are Volatile Organic Compounds and particulate matter.

Volatile Organic Compounds (VOC) emission reduction

Part A Process Operator	1998 tonnes/yr	Year One 1999 tonnes/yr
Fairey Hydraulics, Claverham	2	0
GKN, Westland Industrial Products Ltd, Weston-super-Mare	25	12 and then ongoing reductions
Praxair Surface Technologies, Weston-super-Mare (also emits particulates)	4 to 5	1

Summary of North Somerset Council Air Quality Monitoring Results

Parameter	Year	Location/data points	EPAQS Std	Comments
PM10	1996	Portbury/30	50 µg/m ³	Exceedence of standard at 2 data points, 60 µg/m ³ and 62 µg/m ³ .
Dust (aluminium frisbee)	1996	Portbury/4 locations 48 data points	200 mg/m ² /d	Exceedence of standard at 2 data points at a location, both in April: 220 mg/m ² /d and 250 mg/m ² /d.
Dust M type sampler	1996	Portbury/4 locations 204 data points	50 µg/m ³	Exceedence of standard at 12 data points in February to June, highest 85 µg/m ³ .
Benzene	1996	North Somerset (not Weston-super-Mare)/ 9 locations 108 data points	5 ppb	No exceedence of standard. Highest reading is 3.6 ppb.

Parameter	Year	Location/data points	EPAQS Std	Comments
Benzene	1996	Weston-super-Mare/7 sites	5 ppb	No exceedence of standard; only 1 data point above 3 (only trend is slightly higher in January/February/March).
NO ₂	1996	17 sites including motorway	145 ppb	No exceedence of standard. Highest 60 ppb at Weston-super-Mare Junction 21 - many above 40 ppb. Only other above 40 ppb; 1 data point at Clevedon Junction 20. All other sites below 30 ppb.

In marked contrast to Bristol's high levels of nitrogen oxides, North Somerset data are significantly lower. The highest points are at M5 junction locations, but these are still way below the EPAQS limit. Similarly benzene data are well below the limits.

The only parameter where limits are exceeded is for dust and particulate matter.

North Somerset Council advises us that the high levels of PM10 are associated with groundworks at Portbury Docks, which are by their nature a one-off. The high levels of particulate matter from the M-Type Sampler are coincident with holiday traffic build-up exacerbated by the road works on M5 Avon Bridge close to the sampling point. The M sampler collects particles in the 10 to 20 micron range. North Somerset Council did try to use NO₂ sampling, but the results were so widely varying that the data were seen to be unreliable to give a true representation of air quality in the Portbury Dock area. However, even without the data the major and only long term air quality problem is associated with the M5 traffic and specifically due to the extensive roadworks on the Avon Bridge. This work is set to continue into 2001. The types of air quality measurement in the table are the only ones available in the area.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
4.1.1 Ensure emissions to air from 'Part A' processes are reduced as detailed above.	Agency, process operators	6 per year	●	●	●	●	●
4.1.2 Reduce business mileage - see Action 3.1.1 Climate Change.	Agency	Unknown	●	●	●	●	●
4.1.3 Report local authority air quality monitoring results in future LEAP Annual Reviews.	Agency, North Somerset Council	Nil		●	●	●	●

Air does not recognise our catchment boundaries and it is likely that air quality in this catchment can be affected by poor quality air from South Wales or Avonmouth.

5. Water Resources

There is a continuing need to balance the demands for, and supply of, fresh water. Nationally about half of the present demand is for water to be put into public supply, and the water resources which have been developed to meet this demand are highly integrated; in many cases they involve a combination of water drawn from rivers, underground aquifers (layers of water-bearing rock), and reservoirs, and often supplied through an interconnected grid of pipes. In this catchment 86.5% of licensed abstraction is for public supply. The remaining 13.5% of licensed abstractions are for agriculture, industry, private domestic supply, spray irrigation, commercial and leisure. Currently demand is more or less static and we do not have any general licensing constraint policy for this catchment. New licence applications would be looked at on a site-specific basis and we are closely monitoring the overall demand situation.

The Environment Agency has a duty under the Water Resources Act 1991 to take action, as and when it considers necessary, in order to conserve, re-distribute or otherwise augment water resources in England and Wales, and to secure the proper use of water resources.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 16 water resources actions, 11 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 demand a more efficient use of water and reductions of leakage by the water companies and by industry in general;
- 2 encourage a more efficient use of water by the public and a change in public attitude to water usage;
- 3 demand reductions in leakage by the water companies before considering any cases for investment in new reservoirs (or other new sources);
- 4 support the imposition of compulsory selective metering where water supplies are under stress and where meters are economically sensible to install;
- 5 support the voluntary acceptance of water meters when accompanied by other water-saving incentives for the customer;
- 6 vigorously apply our Policy and Practice for the Protection of Groundwater (PPPG) to ensure that the quality and use of the groundwaters is improved;
- 7 examine water transfer schemes carefully to ensure that no environmental damage would result from their introduction;
- 8 not approve the exploitation of new environmental resources until water-saving measures have been introduced;
- 9 implement the current programme of alleviating low-flow rivers as quickly as possible;
- 10 ensure that the practical limitations arising from water supply and treatment are fully considered by providing local planning authorities with all information relevant to new housing or industrial developments (although no limitations to water supply apply in this area at the moment);

- 11 ensure that all environmental needs are fully taken into account within the next Asset Management Plan (AMP) negotiations with the water companies (also, OFWAT and the Government).

In this catchment aquifers provide 42 megalitres/day (Ml/d) compared with 36.7 Ml/d of surface water. Of the total groundwater 95% is for public water supply thus demonstrating very clearly the importance of point 6 - the implementation of our Groundwater Protection Policy (PPPG) - in this catchment.

The precise impact of new development on water resources is difficult to predict and plan because the water company supply zones are much larger than this catchment and because water can be piped in from other sources, in particular from the River Severn via the Gloucester and Sharpness Canal and the Purton Water Treatment Works, where plans are in place to pipe in more water.

The level of demand in Bristol Water's Supply Area is forecast to rise from the current 310 Ml/d to 427 Ml/d by 2021, assuming the current level of metering and leakage control with high growth in domestic, industrial and commercial consumption. Should growth in consumption be slower and Bristol Water reduce leakage from 120 litres per property per day then demand is forecast to rise to 380 Ml/d by 2021.

Currently, Bristol Water's resources in this supply zone exceed demand by 17 Ml/d. By 2021, under the lower demand forecast scenario the company's demand is predicted to exceed resources by 19 Ml/d. Under the higher demand scenario the deficit is forecast to rise to 66 Ml/d by 2021.

The above is based on average demand not peak demand. Despite the very dry weather and elevated demands for public water during 1995 Bristol Water were able to meet their customers' requirements with no or minimal restriction. However, it is clear that an analysis of peak demand against resources, rather than average demand, could bring forward some of the supply deficits mentioned in this section. For full details of the wider water resources situation see the Agency's South West Regional Water Resources Strategy document 'Tomorrow's Water'.

We will encourage the joint use of public supply sources in order to increase the amount of water deliverable without requiring physical development of new sources such as reservoirs or new boreholes. We encourage the private storage of winter rainfall to supply private use such as spray irrigation.

We have set up a National Demand Management Centre at Worthing and they have had a water demand reduction display at the Ideal Home Exhibition.

We will ensure local planning authorities are aware of any practical limitations on water supply and treatment when advising on planning applications. We will aim to have suitable policies in place in Local Development Plans.

We have identified a need to liaise more closely with developers, water companies and local councillors over this and other such development pressures as well as the need to improve the environmental awareness of developers, councillors and the general public. This is particularly important in this catchment, where there are large areas of important wetland and North Somerset Council have to select locations for a considerable number of new houses.

By means of abstraction licensing we try to ensure that river flows are not adversely affected by over-abstraction or impoundment. However, in this catchment there is a dry stretch of watercourse below Barrow Gurney Reservoirs due to lack of a compensation flow (see 8.5 for details and Action 8.5.3).

The DETR is currently carrying out a review of the whole abstraction licensing system.

5.1 Securing future public water supplies

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
5.1.1 Manage Demand - We will work with the water companies to identify any problems of meeting demands in this Resource Zone and consider viable solutions.	Agency, Bristol Water, Wessex Water	2	●	●	●	●	●
5.1.2 Manage Demand - We will monitor and encourage implementation of water company efficiency plans.	Agency, Bristol Water, Wessex Water, consumers	Unknown	●	●	●	●	●
5.1.3 Manage Resources - We will encourage the water companies to actively reduce leakage to economic levels. <i>Leakage</i>	Agency, Bristol Water, Wessex Water	Unknown	●	●	●	●	●
5.1.4 Work with water supply companies to prioritise expenditure on water resource management and development. Ensure Agency's demand management targets are met.	Agency, Bristol Water, Wessex Water	Unknown	●	●	●	●	●
5.1.5 Reduce our North Wessex Area Office water consumption to 30% below the industry accepted target per office employee. (Does not apply to depots.)	Agency	Unknown	●	●	●		
5.1.6 Improve the environmental awareness of local councillors and developers (see also Section 9).	Agency	0.5		●			

6. Biodiversity

The European Union is concerned about the decline in biodiversity (the variety of life on earth). As a result member states are producing Biodiversity Action Plans (BAPs) in an effort to halt and reverse the decline of species and habitats. The UK Biodiversity Action Plan lists key habitats and species which require conservation action, through Regional and Local Biodiversity Action Plans. The Regional Biodiversity Audit Plan for the South West was published in April 1996 and was followed by Action for Biodiversity in the South West in June 1997 - a series of habitat and species plans to guide delivery. The Regional and Local Action Plans are currently being developed by local authorities, English Nature and others, including the Environment Agency.

We are working with a number of organisations to formulate and implement habitat and species action plans at both regional and local levels over the next five to ten years, including:

- The North Somerset Council BAP (in progress)
- The Mendip District Council BAP (completed)
- The Bath and North East Somerset BAP (in progress)
- Sedgemoor District Council BAP (in progress - due early 1999)
- Local Agenda 21 Action Plans
- English Nature's Natural Area Profiles for: Somerset Levels and Moors, Severn and Avon Vales, Mendip Hills.

The Agency is developing National Species Action Plans and is the contact point for the following species which are known to occur within the catchment: otter, water-vole and native crayfish. The Agency also has an important role to play in partnership with others in the conservation of habitats including: lowland wet grassland; rhynes and ditches; reedbeds; fen meadows; raised mires; tufa depositing springs; and headwater streams. We aim to protect sensitive sites through our authorisations to abstract water and discharge effluents and through our own activities.

Blagdon Lake SSSI is an important wildfowl site and has surrounding meadows containing a rich mix of unimproved grassland, wild flowers and wet grassland plants. These habitats, together with small patches of woodland, are managed by Bristol Water plc with the aim of maintaining and improving wildlife. The company has developed a biodiversity action plan for the site, and this is compatible with the South West Regional BAP. Wessex Water have also recently produced a BAP which includes the North Somerset Rivers Catchment.

Biodiversity is a key indicator sustainable development (see Section 2 - Introduction). The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 12 actions to enhance biodiversity, 11 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 play a full part in implementing the European Community (EC) Habitats Directive (see Action 6.1.);
- 2 play a full and active part in delivering the UK's Biodiversity Action Plan by acting as the 'contact point' for the chalk rivers habitat and for 12 species of aquatic animals and plants, including the otter, the water-vole, and rare species of fish, and by acting as the 'lead partner' either singly or in collaboration with others for 10 of them;

- 3 ensure that all aspects of the Biodiversity Action Plan are incorporated into the Agency's guidance and become part of its Local Environment Agency Plans;
- 4 implement a series of regional projects, in partnership with local conservation groups, to deliver biodiversity targets at specific sites;
- 5 allocate specific resources to conservation projects aimed at increasing biodiversity;
- 6 control eutrophication, where feasible, in order to enhance biodiversity (see Actions 8.1 and 8.2);
- 7 improve the management of wetlands for conservation purposes;
- 8 use and promote the best environmental practice for the protection and restoration of river habitats;
- 9 develop and set conservation criteria for all of the Agency's environmental licensing activities;
- 10 implement specific projects to restore habitats in rivers and lakes, increase the area of reedbeds and other water plants, and improve river banks;
- 11 ensure that there is no deterioration in the quality of the aquatic environment in particular, and deliver significant improvements in river and still water quality by tackling diffuse pollution of them (see 8.2.3).

Invasive plant species including Himalayan balsam and Japanese knotweed (a leaflet giving advice on control of invasive plants is available) are widespread throughout the catchment; there is a general spread of the non-native plants along the river margins, often at the expense of native species. Some of the channels which are regularly dredged tend to have disturbed plant communities developing on their banks. These can include species such as oilseed rape: for example, along the River Yeo at Congresbury. Aquatic species such as water fern and swamp stonecrop are also present in this plan area.

We are continuing the national programme to reduce emissions of sulphur and nitrogen oxides from major power plants and thereby reduce pollution from fallouts onto wetland sites. We help to promote the creation of reedbeds, which are a specialised water-related habitat included in the South West BAP. Reedbeds are increasingly being used by local authorities for road runoff and stormwater attenuation as a certain amount of pollutant removal takes place.

The North Somerset Levels and Moors Project is a partnership between North Somerset Council, English Nature, the Wildlife Trust, the Countryside Commission and the Environment Agency. The Project aims to promote greater appreciation and enjoyment of the countryside and encourage the sympathetic management of the grasslands, rhynes and ditches and hedgerows that cross the project area. The North Somerset Levels and Moors Project works closely with landowners, farmers, local people and particularly the Internal Drainage Boards (IDBs), who should be consulted at an early stage in any proposed project. Although the Agency cannot give grants for any such work we provide support by giving technical advice and information. In some site-specific projects we provide part funding with other partners.

We work with the IDBs to produce Water Level Management Plans (WLMPs), which give an opportunity to encourage a change to farming practices which are more sympathetic to wildlife.

The North Somerset Countryside Strategy launched by North Somerset Council in 1995 is both an audit and a set of objectives for wildlife, landscape, archaeology and recreation. The document has raised many issues relating to the uses of the countryside and will continue to be an important document for future decision-making.

The Farming and Wildlife Advisory Group plays a major role in improving agricultural practice on farms throughout the catchment. For example, there are some farm schemes in the Yeo valley that have included pond, hedgerow and woodland restoration, and discussions are taking place to undertake some river rehabilitation work on the Langford Brook

MAFF's Countryside Stewardship grant scheme continues to assist farmers to adopt environmentally sensitive farming practices. Again there are numerous agreements in operation, particularly on the Mendip Hills and within the Levels and Moors; of particular note are the Countryside Stewardship payments to establish buffer strips. An advisory booklet is available from FRCA. There are a number of farms within the North Somerset Levels and Moors area considering options for raised water level areas, which are of considerable importance because they provide the ideal conditions for over-wintering wildfowl and breeding waders, as well as conserving other wetland flora and fauna.

6.1 Maintaining and enhancing biodiversity

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
6.1.1 Habitats Directive - following advice from English Nature (EN) review current abstraction licences and consents to discharge in relation to SPA/RAMSAR/pSAC designations as required by the EC Habitats Directive. The review will assess water quality data and where appropriate the inclusion of nutrient standards in consents will be considered.	Agency, EN	Unknown	●	●			
6.1.2 Biodiversity Action Plan - work with North Somerset Council (NSC) on their forthcoming Biodiversity Action Plan (BAP).	Agency, NSC, EN, The Wildlife Trust	Unknown	●	●	●	●	●
6.1.3 Lowland Wet Grassland - we are continuing to contribute to the development of WLMPs within the North Somerset Catchment (see 8.2).	Agency, IDBs	Unknown	●	●	●	●	●
6.1.4 Reedbeds - help to promote reedbed habitat creation in partnership with others e.g. North Somerset Levels and Moors Project. Provide technical advice on the use of reedbeds as part of stormwater attenuation and treatment systems associated with development.	Agency, North Somerset Council, NSL&MP, Wessex Water, IDB	Unknown	●	●	●	●	●
6.1.5 Tufa Streams - Survey tufa-depositing springs and headwater streams to assess value and develop conservation strategy.	Agency, BRERC, The Wildlife Trust	Unknown	●	●			
6.1.6 Water-Voles - increase our knowledge of distribution and investigate the main reasons for the absence of water-voles from large areas of the catchment, in partnership with others.	Agency, BRERC, NSL&MP	Unknown	●	●	●	●	●

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
6.1.7 Otters - develop partnership to monitor otter populations.	Agency, NSL&MP, BRERC	Unknown	●	●	●	●	●
6.1.8 Otters - establish otter corridor links to adjacent catchments through habitat creation.	Agency, NSL&MP	Unknown	●	●	●	●	●
6.1.9 Otters - enhance habitats.	Agency, NSL&MP	Unknown	●	●	●	●	●
6.1.10 Otters - collect carcasses of otter road casualties and send for tissue analysis.	Agency	Unknown	●	●	●	●	●
6.1.11 Barn Owls - extend scheme to provide and monitor nest boxes and manage habitat to encourage voles on Agency-owned land on the Blind Yeo.	Hawk and Owl Trust, Agency	Unknown	●	●	●		
6.1.12 Native Crayfish - extend survey work, particularly within the Upper Congresbury Yeo and Land Yeo catchments, to enable the formulation and implementation of a local crayfish conservation strategy.	Agency	Unknown	●	●	●	●	●
6.1.13 Great Crested Newts - undertake desktop survey to enable the formulation and implementation of a conservation strategy.	Agency, BRERC	Unknown	●	●			
6.1.14 Eels - implement recommendations of Barriers to Migration survey. (See Action 7.1.2.)	-	-	-	-	-	-	-
6.1.15 Continue to assess and monitor the distribution of invasive and alien plants and problems associated with alder disease.	Agency, North Somerset Council, NSL&MP, BRERC, AWT, FoA, LAS	Unknown	●	●	●	●	●

7. Fisheries

The Environment Agency has a specific duty to assess the state of, and safeguard, freshwater fisheries and the waters which they inhabit. In 1978 a European Community (EC) Freshwater Fish Directive was adopted (78/659/EEC) with the purpose of setting water quality objectives, for designated stretches of water, to enable fish to live continuously (rather than just support migration) or breed in favourable conditions. Two categories of water were identified: those suitable for salmonids (salmon and trout), and those suitable for cyprinid fish (carp, tench, rudd, roach), the essential difference between the two categories being that salmonid fish habitats are characterised by fast-flowing reaches of rivers which have a high oxygen content and a low level of nutrients, whereas cyprinid fish habitats are those of slower-flowing waters. Various standards were set in relation to these categories, including values for dissolved oxygen, pH, non-ionised ammonia, total ammonium, total residual chlorine, zinc and, where thermal discharges occurred, temperature. The Directive does allow for the granting of derogations at a national level with respect to certain substances, for which the required standards may be exceeded in cases of exceptional weather conditions, or geographical conditions, or because of natural enrichment of the water from substances leaching from the soil.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 12 actions to manage our freshwater fisheries, 5 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 monitor every river fishery over a 5 year rolling cycle (this is a national target and here in North Wessex we will find this difficult to achieve - 6-7 years would be more realistic with current staffing levels);
- 2 restore spawning grounds for freshwater fish;
- 3 implement a programme of minimum acceptable flow for rivers;
- 4 develop specific longer-term strategies for salmon, trout and coarse fisheries;
- 5 reduce poaching to a minimum and bring rod licence evasion to under 10%.

Additionally we will address the problems of:

- penning and low flows which cause or contribute to adverse effects on fisheries (see 8.1.2 and 8.2.4). Algal blooms can cause or contribute to the exceedence of EC Freshwater Fish Directive Standards (see 8.1.2)
- maintenance of rivers, particularly weedcutting, can damage habitats and can stir up sediment causing oxygen depletion and distress to fish (see 8.3). Also, the operation of sluices by private owners as well as Agency staff, needs to take fisheries into account.

As well as adequate water quality the diversity of physical habitat is important for supporting good fish populations. We will take opportunities to improve habitat diversity (see 8.3.4).

7.1

Migration barriers and fish losses

Most of the rivers draining into the Bristol Channel have water-level control structures located at strategic positions along their lengths, including at their downstream tidal limits. Some of these are quite large. We know that elvers are able to pass upstream of many of these barriers, from their presence in surveys and catches upstream. Mature eels will also make downstream migrations out to sea through these structures. However, within the overall context of eel populations in Somerset rivers the structures could be expected to have some impact. In the light of increased commercial fishing pressures and reported Europe-wide declines in elver numbers the Agency has carried out a survey of some of these structures locally with a view to considering options for improving passability to eels. Attention has centred mainly on the Rivers Parrett, Tone, Brue, Axe and Huntspill but is applicable to most rivers including those of North Somerset, although they are a lower priority. We will consider the viability and logistics of providing eel passes at key structures within an overall eel management plan.

Water-level control structures, particularly the tidal ones, are often thought by anglers to be responsible for allowing populations of coarse fish to be washed out to sea and lost to the fishery. This issue, which is of relevance at similar structures across the country, is to be addressed in a national R&D project.

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
7.1.1 Contribute to National R&D to investigate the effect of river control structures on fisheries. Action deferred - awaiting funding.	Agency	Unknown						
7.1.2 Implement Barriers to Migration survey (eels and elvers) - awaiting funding.	Agency	Unknown						
7.1.3 Assess fish stocks in the River Yeo Congresbury.	Agency	2		●				
7.1.4 Draw up improved strategy for river maintenance to reduce harm to fisheries (see Action 8.3.1).	Agency	-	-	-	-	-	-	-
7.1.5 Contribute to a national review of licence duties for eel and elver fishing.	Agency	Unknown	●	●				
7.1.6 Establish the frequency of algal blooms, the extent of eutrophic effects and the source of excess nutrients. (See Section 8.2.)	Agency	-	-	-	-	-	-	-

8. Integrated River-Basin Management

Integrated river-basin management is a way of looking at the river and its surrounding land as a whole. It looks not only at the quality and quantity of water in the river but also at its physical environment including landscape, recreational use, flood control works and the wildlife the river and its surroundings support.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 16 actions to deliver integrated river-basin management, 13 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 manage river-basins in an integrated way, via Local Environment Agency Plans;
- 2 ensure that all waters are of sustainable quality for their different uses;
- 3 deliver a continual improvement in overall water quality;
- 4 provide effective flood defence;
- 5 provide an effective flood warning system;
- 6 increase the number of rivers and still waters capable of supporting viable fisheries;
- 7 enhance and conserve inland navigations, as national assets of environmental, economic, social and recreational value;
- 8 improve river habitat quality as measured by river habitat surveys;
- 9 improve wetland management;
- 10 improve riverside landscapes;
- 11 improve bathing water quality (see Severn Estuary Joint Issues Report);
- 12 increase the number of Agency-owned sites available for public recreation;
- 13 work with local authorities to maximise the conservation and recreational use and value of our river-basins.

Water quality - we regulate effluent disposal by issuing consents to discharge. We also carry out a major programme of monitoring to assess compliance both of the consent and of the receiving watercourse with its River Quality Objective (RQO) (see below).

Improvement schemes for Wessex Water Services Ltd (WWSL) STWs are subject to available funding. The Water Company's improvement plan, known as Asset Management Plan 2 (AMP2), was developed based on guidelines agreed between the NRA, the former DoE, the water service companies and OFWAT in 1994. AMP2 runs from 1995 to 2000. OFWAT has recently initiated a five-year review of water prices which will result in AMP3, running from 2000 to 2005. We are currently identifying those STWs where improvements are required.

We manage water quality by setting chemical targets called River Quality Objectives (RQOs). They are intended to protect current and future use, and we use them as a basis for setting consents for new discharges and planning future water quality improvements. In addition we are reviewing consents to discharge to SPA/RAMSAR/pSACs (see 6.1). We also manage water quality by applying standards set in European Community (EC) directives and other international commitments.

We have set our RQOs using a classification scheme known as River Ecosystem (RE). The RE classification comprises five hierarchical classes as summarised below.

RQO (RE Class)	Class Description
RE1	Water of very good quality suitable for all fish species
RE2	Water of good quality suitable for all fish species
RE3	Water of fair quality suitable for high-class coarse fish populations
RE4	Water of fair quality suitable for coarse fish populations
RE5	Water of poor quality which is likely to limit coarse fish populations

The latest compliance with the targets we have set is shown on Map 2 inside the back cover. Following publication of the North Somerset Rivers Consultation Report concern was raised over the RQO of RE3 for the stretch of the River Yeo Congresbury, from Blagdon Lake to Perry Bridge. We have reviewed information on water quality and the use of the stretch, and as a result we have upgraded the RQO from just RE3 to RE3 with a Long Term RE2.

We also monitor biological quality and classify river stretches using a scheme of six classes.

Biological Class	Class Description
a	Very good
b	Good
c	Fairly good
d	Fair
e	Poor
f	Bad

Non-compliance with an RQO or EC Directive, or degraded biological quality are not issues in themselves, but rather they are the effects of some pressure on the environment. Such pressures are: sewage treatment works effluent, direct and diffuse agricultural discharges, the impact of low-gradient channel modification, penning, hot weather, abstraction, some maintenance practices (weedcutting and dredging), landfill leachate, and industrial discharges. The pressures affecting this catchment were identified in the Consultation Report and will be dealt with in the issue sub-sections which follow this introductory text.

Flood defence - watercourses in the lower-lying parts of the catchment have been highly modified to control river and tidal flooding and provide summer water supply for wet fencing and irrigation. Riparian landowners have the responsibility to maintain the watercourses on their land, although in practice the situation is rather different. Under the Land Drainage Act 1991 the more significant rivers are designated as 'main river' and the Act gives the Agency powers to maintain them, and in practice we maintain them using money

obtained from a precept on the Council Tax. We are also responsible for a large number of water-level management control structures. The three Internal Drainage Boards (IDBs), Gordano, North Somerset and West Mendip, have powers to maintain non-main river rhynes within their areas. In practice they only maintain the more important ones, called 'viewed rhynes'. Internal Drainage Boards are financed according to a statutory formula which ensures a fair division between an agricultural land rate and a special levy on District or Unitary Councils.

Local authorities have powers to maintain non-main river though in practice they only exercise them where lack of maintenance is causing a significant flooding problem. The Agency has an overall duty to supervise flood defence matters. We do this by advising on who is the appropriate person or body to deal with a problem.

In accordance with the Department of the Environment (DoE) Circular 30/92 *Development and Flood Risk* we advise planning authorities on flood defence matters. We also issue consents and bylaw approvals for certain works which are likely to affect the flow of water or impede any drainage work (see Section 9 - Conserving the Land).

Future development proposals within North Somerset and Somerset Local Plans are concentrated primarily within and around the existing settlements in the North Somerset Rivers Catchment.

Levels of flood protection, tidal for the lower catchments and fluvial for the upper catchments, are relatively high; however, increased development will require flood mitigation works to overcome risk to third parties from increased surface water disposal. Our current Standards of Service for defences are shown below (in accordance with guidance laid down by MAFF).

Standards of Service: Land Use Bands and Targets

Land use band	Description of typical land use	Target standard of flood protection (flood return period) in years	
		Fluvial	Saline
A	Urban	1 in 50-1 in 100	1 in 100-1 in 200
B	Lower-density urban	1 in 25-1 in 100	1 in 50-1 in 200
C	Isolated rural communities	1 in 5-1 in 50	1 in 10-1 in 100
D	Isolated properties/intensive farming	1 in 1.25-1 in 10	1 in 2.5-1 in 20
E	Low-grade agricultural land	<1 in 2.5	<1 in 5

Absolute flood protection is not possible. Because of this we need to warn people when there is a danger of flooding. We took over the role of warning the public and other organisations of likely flooding from the police on 1 September 1996. We have developed communication systems and aimed at providing flood warnings to those members of the public most at risk. We have a strategy which details how the procedures operate, called the Flood Warning Dissemination Plan for Somerset and Avon areas; a copy is held in the Area office for public inspection.

Warnings are issued by direct contact and via local radio. Recorded information on current flood warnings is also provided. Leaflets are also available from Agency offices which fully explain the flood warning service.

A study of the level of service for flood warning is currently being carried out to determine whether the required standard is met. The results will identify additions and other changes to the flood warning service.

The North Somerset Rivers Catchment supports some nationally important areas of high nature conservation value with some of the best examples of biologically-rich rhyme and ditch systems in the South West. The catchment's coastal boundary is the Severn Estuary which is designated as a Special Protection Area (SPA) and a RAMSAR site. The North Somerset Levels and Moors have missed out on the recognition and biodiversity enhancements that the Environmentally Sensitive Area (ESA) across the Somerset Levels and Moors has brought. The Agency will look at them as part of its review of the Somerset Levels and Moors Conservation and Water Level Management Strategy and there is the possibility of a separate report. Recent developments have resulted in the area being specifically targeted for MAFF's Countryside Stewardship Scheme through which ecological maintenance and enhancement can be managed.

The EC Habitats Directive seeks to protect habitats and species of European importance by designating Special Areas for Conservation (SACs). The process of defining the Severn Estuary SAC is under way and will be completed during 1998.

The ancient ridge and furrow drainage system for wet meadows in North Somerset are a prominent and characteristic feature of the Levels landscape. They are alternating shallow depressions for drainage and low raised areas of drier ground. Their presence adds structural diversity and interest to the grasslands.

The Agency has received a number of applications recently for the levelling of these field systems using waste material. The Agency will adopt a presumption against such activities as damaging to the historic landscape interest.

We will use every opportunity to improve river habitat quality, wetland management and river landscape by working with the North Somerset Levels and Moors Project and by helping to implement North Somerset Council's North Somerset Countryside Strategy.

8.1

The decline in water quality

Since raising this issue in the Consultation Report the position has greatly improved. In 1997, 79.2 km of rivers were monitored in the North Somerset Rivers Catchment. Of the monitored river length in the catchment 40.5% was of very good or good chemical quality, 19.7% was fairly good and 39.8% was fair or poor. Water quality has improved since 1995.

We hope to maintain and where possible enhance water quality by means of River Quality Objectives (RQOs) - see Section 8 introductory text, above. However, our objectives have to be realistic and achievable and so we have proposed RQOs of RE4 and in one case RE5, mainly because of the problem with dissolved oxygen. However, RE5 'poor quality' is the lowest objective and our catchment Steering Group have recommended upgrading this to RE4. The sustained attainment of higher quality standards may not be possible and a full review of all factors affecting quality on this stretch is necessary before a decision can be made as to whether an upgrade to RE4 or setting a Long Term RQO of RE4 is appropriate.

Much of the effort needed to improve water quality will be done as part of the routine work of our Environment Protection teams and will involve farm visits, general pollution prevention advice, monitoring work and the enforcement of consents to discharge. No new RQO non-compliance occurred in 1997 since the Consultation Report was written. One stretch - M5 to Icelton on the Congresbury Yeo - marginally failed its RQO of RE2 in 1996 but complied in 1997. However, specific additional actions are listed below, and in other issues within this plan.

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
8.1.1 Review RQO, currently RE5, for the stretch: River Land Yeo - Clevedon to sea.	Agency	3		●	●			
8.1.2 A full review of all factors affecting water quality, including flow, on those stretches with RE4 and RE5 as proposed objectives. We will prepare the tender in 1999/2000.	Agency, IDBs	15.5		0.5	15			

8.2 The impact of river regulation and nutrient enrichment

Many of the watercourses in the catchment have significant abstraction from their headwaters for water supply. Except at times of very heavy rainfall, flows are restricted to relatively low 'compensation' flows required by the abstraction licence. In many catchments water taken out for public supply is returned as treated sewage effluent and augments flows further downstream. However, in this catchment most of the sewage effluent is discharged directly into the Severn Estuary, thus depriving the rivers of this contributory flow. Penning (holding back river levels artificially high using structures such as fixed weirs or adjustable sluices) is traditionally carried out to irrigate farm land and provide 'wet fencing' and so is of vital importance to sustain agriculture on the Levels and Moors. It does however affect flows and increase water losses by evaporation and plant transpiration and so contributes to lowering flows in the main river channels. (It also helps to preserve peat soils by keeping water tables high.) Penning leads to lack of aeration and subsequent low dissolved oxygen levels. Hot, dry summers worsen this problem as warm water holds less oxygen than cold water. In addition penned reaches are more sensitive to the impact of discharge than a flowing river system. In the River Banwell DO drops from 90% in the upper unpenned reaches to 8% in the lower penned reaches. We will improve our understanding and control of the drainage system to ensure best use of the available resources and, where appropriate, minimise the diversion of water from the principal rivers and drains during dry weather. This will partly be achieved by Water Level Management Plans (WLMPs). In this catchment West Mendip IDB has completed three WLMPs for Churchill and Sandmead Rhyne, Hurstpool Rhyne and Oldbridge River and Liddy, and we are leading or contributing to the Gordano Valley, Yeo Rhyne and North Somerset WLMPs. Where very low dissolved oxygen levels result in fish kills we will aerate the water as an emergency measure.

Reduced flow can lead to the deposition of the river's bed load of silt which may smother fish eggs and other aquatic life. This is a problem on the Blind Yeo.

Very low flows and penning contribute to the build-up of plant nutrients within the watercourse. The main nutrients are nitrate and phosphate. They arise from diffuse agricultural pollution (fertilisers - where nitrogen dominates phosphate) and from sewage effluents where phosphate concentrations are significant. The nitrate is produced by the breakdown of human sewage, and the phosphate arises from modern detergents and washing powders. Phosphate is the more important nutrient released into freshwater since it is often the limiting factor in promoting plant growth. Between 30 and 50% of the phosphate load from a typical STW comes from detergents. Up to 30% of phosphate entering freshwater comes from agricultural sources.

Phosphate is not removed by conventional sewage treatment. Phosphate stripping is costly and may only be installed at some large sewage treatment works (STWs) as a requirement of the EC Urban Wastewater Treatment Directive. It has not been installed at any STWs in the North Somerset Rivers area. Where nutrients build up in watercourses excessive growth of plants, known as eutrophication, can occur. Often one particular species dominates, such as one of the pondweeds or filamentous algae, leading to blanket cover of the whole watercourse. Where in addition to nutrient build up, penning reduces flows to very low levels, blooms of planktonic algae can result. (See Issue 4.5 Consultation Report.)

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
8.2.1 Establish the extent of eutrophic effects.	Agency	2		●				
8.2.2 Work with others to reduce nutrient levels by controlling point sources and diffuse agricultural pollution (see Issue 4.8 Consultation Report); once the source of nutrients has been pinpointed, target specific campaigns in those areas, including the promotion of buffer strips where possible.	Agency, farmers, MAFF, FWAG	Ongoing cost 0.5 per year	●	●	●	●	●	●
8.2.3 Improve our regulation of the spreading of waste to land to prevent water pollution. Identify any trouble spots.	Agency, farmers, MAFF	2 per year	●	●	●	●	●	●
8.2.4 Review control of penning structures through the WLMP process and identify opportunities for raising winter water levels.	Agency, IDBs	Unknown	●	●				
8.2.5 Consider the provision of additional storage volume to provide more irrigation water.	Agency	Unknown		●				

8.3 The impact of river maintenance

Some of the rivers in the catchment have been highly modified to reduce or control flooding. For example, some rivers like the River Banwell have been canalised, others like the River Yeo are heavily embanked, and some like the Lower River Kenn and Land Yeo now have part of their natural flow diverted into other watercourses (see Issue 4.6 Consultation Report).

Re-engineering channels to improve their wildlife and environmental value is costly and is only justifiable if major investment is needed to improve floodbanks or other flood defence structures. We are prioritising river restoration schemes for the future. These may be the subject of partnerships with local authorities or use developers' contributions in order to fund and to take forward projects.

Present standards of flood protection can only be sustained by intensive maintenance of the channels and banks including dredging, weedcutting and tree/scrub clearance. This maintenance regime can bring environmental problems affecting water quality and river habitats. Maintenance regimes are being reviewed as part of the implementation of the Flood Defence Management Methodology.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.3.1 Review flood defence maintenance and develop Flood Defence Management System.	Agency	Unknown	●	●	●	●	
8.3.2 Survey assets. Classify upland river reaches in accordance with the SoS (see Section 17.4 Consultation Report).	Agency	Unknown	●	●	●	●	
8.3.3 The current state of flood protection will be compared to target standards in 1998 and differences addressed (see Section 17.4 Consultation Report).	Agency	Unknown	●	●	●	●	
8.3.4 Seek resources to re-engineer channels and floodbanks to provide a more natural shape and improved habitat diversity as need or opportunity arises (see Section 10.7 Consultation Report).	Agency, riparian owners, developers, North Somerset Council	Unknown	●	●	●	●	●
8.3.5 Explore tree planting opportunities and implement where funding becomes available to provide shade and reduce the need for aquatic weed cutting as appropriate sites are identified. The riparian owner's agreement is needed; maintenance access should not be blocked; and the planting should not damage an important habitat.	Agency, FWAG, landowners, IDBs, NSL&MP, RSPB	2.5	.5	.5	.5	.5	.5

8.4 The impact of agricultural discharges and runoff

Both diffuse pollution from fertiliser (see 8.2) and pesticide runoff and direct consented and unconsented farm discharges (e.g. slurry, silage, yard and parlour washings) can cause problems of degraded water quality in both surface water and groundwater. Reports have been received and investigated of episodic farm discharges to the Land Yeo. These are usually related to periods of heavy rainfall. Diffuse runoff of fertiliser leads to nutrient enrichment and can cause excessive and blanket growth of plants such as algae and duckweed (see Issue 4.5 Consultation Report). Currently, most farmers are reviewing their inputs and as a result are reducing fertiliser use to cut costs. Note that sewage treatment works also contribute to the nitrate and ammonia load in watercourses.

We will work with others such as MAFF and FWAG to promote good agricultural practice.

Monaghan Middlebrook Mushrooms is one of the largest mushroom farms in Europe. The main canning factory on site is served by a consented treatment plant which discharges to a tributary of the Langford Brook. Problems have occurred associated with the extensive yard areas upon which the mushroom compost is made.

Monaghan have been in consultation with ourselves and have proposed further measures to reduce the quantity of contaminated water produced and to increase storage; consequently we do not anticipate the scale of problems previously encountered. However, should an exceptionally heavy rainstorm occur these measures may not be adequate. We will continue to liaise with the company to prevent further pollution.

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
8.4.1 Install automatic monitors on the Land Yeo downstream of suspected discharges.	Agency	2		●				
8.4.2 Revisit all suspected farms to ensure that farm waste management is effective and take enforcement action against farms which discharge illegally.	Agency	4		●	●			
8.4.3 Monitor the discharge from Monaghan Mushrooms and Langford Brook downstream of the site to check the effectiveness of the new arrangements.	Agency	2.5	●	●				

8.5 The impact of Barrow Reservoirs and Treatment Works

Since 1995 the Agency has been negotiating with Bristol Water over the need for a consent to discharge to a tributary of the Land Yeo. As part of the drinking water treatment process sand filters are used to help clean the untreated water. Periodically these are themselves cleaned by back-washing with water, and it is this effluent which is being discharged to the watercourse.

Part (40%) of the flows of the Dundry and Elwell Springs goes into Barrow Reservoirs, which contribute to Bristol's public water supply. There is no compensation flow downstream of Barrow Reservoirs as the authority for the impoundment was secured under an Act of Parliament which did not require this condition. The watercourse, the Land Yeo at Barrow Gurney, is dry as far as its first confluence, a distance of 2.5 km. We will review the position regarding this stretch and produce our recommendations.

Actions	Action By	Cost to Agency (£K)	Financial Year					
			98	99	00	01	02	
8.5.1 Determine consent.	Agency	0.6	●					
8.5.2 Extend the monitoring downstream of the water treatment works.	Agency	2	●					
8.5.3 Undertake a review of all aspects of the dry stretch below the works, and produce a report.	Agency	10.5	.5	10				

8.6 The recreational use of Agency-owned land and water

We own significant areas of riverside land within the catchment, principally on the Blind Yeo. We will work to enhance the nature conservation value of this land, and to promote appropriate recreation activities. Our conservation and recreation management plans will help to strike a balance between different recreational activities and between recreation and conservation. The plans will also take into account any archaeological interests in the area. They will go for consultation with our partners and are written to support the North Somerset Council Countryside Strategy.

The Congresbury Yeo has great potential regarding water-based recreation. Discussions between the British Canoe Union (BCU) and adjacent landowners will take place to explore the full potential for canoeing.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.6.1 Complete production of a Conservation and Recreation Management Plan for the Blind Yeo.	Agency	2	●				
8.6.2 Implement Blind Yeo Conservation and Recreation Management Plan.	Agency	10	●	●	●		
8.6.3 Investigate feasibility of developing canoe access where appropriate.	Agency, BCU	Unknown	●	●			
8.6.4 Explore the use of Agency-owned land to extend the Two Rivers Way west of Congresbury Road Bridge.	Agency	Unknown		●			

8.7 Riverside landscapes

We will appraise planning applications and proposals for Agency schemes which affect river corridor landscape and advise on best practice, appropriate species to plant etc. having regard to the local landscape heritage.

Traditional river landscapes are under threat by the spread of alder disease which will denude some river banks of tree cover. Whilst little can be done to prevent the spread of the disease, monitoring and a replacement programme may need to be developed for those rivers most affected.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.7.1 Continue to assess the impact on the landscape character of the river corridors where alder disease may have a significant impact on the visual amenity.	Agency, NSC, NSL&MP, BRERC, AWT, FoA	Unknown	●	●	●	●	●

8.8 The impact of synthetic pyrethroid sheep dip (New Issue since Consultation Report)

Sheep are prone to infestations by a number of skin parasites and are dipped for a number of economic, cosmetic and welfare reasons. The immersion of sheep in an insecticide is currently the most effective treatment favoured by farmers.

A variety of different sheep-dip formulations exist. The recent switch to sheep dips based on synthetic pyrethroids is due to concerns about health hazards associated with organo-phosphate based products. A licence is needed to use organo-phosphates but not for synthetic pyrethroids as they are safer to humans. However, synthetic pyrethroids are 100 times more toxic to aquatic life than organo-phosphates. (A leaflet is available.)

The use of synthetic pyrethroids:

- Can result in major losses of aquatic life in rivers from relatively small inputs of sheep dip.
- Can pollute groundwater, affecting both public and private water supplies. Sheep farming occurs on the Mendips and the area is an important groundwater resource serving large populations, so there is a risk of pollution.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
8.8.1 Review data from water company on occurrence of sheep dip in raw waters for potable supply.	Agency	1	●				
8.8.2 Implement targeted monitoring programme of surface waters.	Agency	2		●			
8.8.3 Establish the areas where sheep farming is prevalent and identify high-risk watercourses and groundwater sources.	Agency	0.5		●	●		
	Agency	2		●	●		
8.8.4 Carry out a sheep-dip awareness campaign in the areas identified in 8.8.3.							

9. Conserving the Land

The Agency is committed to protecting the land from pollution and erosion and also to minimising the risk to people and property from flooding (see Appendix 12.6 for details of Agency role).

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 16 actions to conserve the land, 10 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 influence the Town and Country Planning systems to prevent developments in the wrong places;
- 2 implement the Flood and Coastal Defence policy as advised by the Ministry of Agriculture, Fisheries and Food (MAFF) and the Welsh Office;
- 3 provide floodplain surveys to local planning authorities;
- 4 discourage development in floodplains;
- 5 work with nature to reduce coastal flooding;
- 6 report regularly on the state of flood defences;
- 7 identify the state and extent of the problem of soil erosion;
- 8 work with local authorities to identify, and report on the extent of, contaminated land;
- 9 regulate identified 'special' contaminated land sites effectively;
- 10 identify the needs of, and alleviate the effects of, soil acidification in upland areas.

Note: 8 and 9 will not start until Government regulations are in force in July 1999.

9.1 Flood defence and development

The Agency is concerned that in the past, planning authorities have permitted developments where they will suffer flooding and/or exacerbate existing flooding problems. We will, therefore, use our influence as statutory consultee so that planning authorities are able to steer development to places where such flooding problems do not occur. Approximately 10,450 houses are proposed to be built in the catchment between 1989 and 2011.

We give detailed advice to local planning authorities on the location of development in relation to flooding matters in accordance with our Policy and Practice for the Protection of Floodplains, as consultees to Structure and Local Development Plans. We are supplying detailed indicative floodplain maps (so-called 'Section 105' maps) to the local authorities to guide their work on steering development away from river floodplains. Some tidal and river defences in the North Somerset Rivers plan area would have to be upgraded to achieve the Ministry of Agriculture, Fisheries and Food's (MAFF) indicative standard of protection for urban areas before any development could take place in the defended areas. Examples are listed overleaf.

- The River Banwell is a tide-locked watercourse, which means that river levels are below high tide sea level. At high tide gates are closed to prevent the sea entering the watercourse, which prevents the river draining to the sea for several hours in each tidal cycle. This problem is likely to get worse as a result of sea-level rise caused by global warming (see Section 3 Climate Change). Also the river only has agricultural standard river defences. Development is proposed to the east of Weston-super-Mare at Locking Castle requiring upgrading of the defences to a 1 in 100 year flood standard.
- The area of Portbury Dock to the east of Portishead is identified as an 'Action Area' within the North Somerset Local Plan. The Action Area is identified for residential/retail and employment use and covers an area of 185 ha. The majority of the area is subject to tidal flood risk.

The existing tidal defence is owned by the Portbury Sea Wall Commissioners. It is constructed to an agricultural standard only, and therefore considered sub-standard by the Agency. As part of the Action Area infrastructure requirements, we have negotiated a new tidal protection wall/bank for Portishead and the Action Area which will give tidal protection to the 1:200 year event. As the defences are classified as 'strategic', we have agreed to take over the future maintenance of the defences subject to the provision of a commuted sum. We have requested further details of the bank and its environment.

- Fluvial defences around Congresbury would require upgrading before any development could be planned for the protected areas.

There is a need to link the management of coastal defences to the area that they protect by means of suitable policies in the North Somerset District Plan, and the Bath & North East Somerset, North Somerset, Bristol and South Gloucester Joint Replacement Structure Plans (see Section 18 Consultation Report). Areas should be zoned appropriately. For details of coastal defences see the Severn Estuary Joint Issues Report, May 1997.

There is also a need to ensure that developers provide new drainage in a fully integrated way to avoid previous problems of inadequate outfalls: for example, at Locking Castle, where as a result of plan allocation in the 1980s huge swathes of land are available for development on the north-eastern side of Weston-super-Mare. This area is generally known as Locking Castle. Development in this area has been allowed to commence, with around 300 houses being completed. Unfortunately the appropriate infrastructure to accompany the development was never finished. As this land is flat it required the introduction of a drainage system incorporating four balancing ponds and a number of pumping stations to move surface water into them. To date part of this infrastructure has not been built. This leaves the area at risk from flooding not only from the nearby River Banwell, but also from the inadequate drainage infrastructure in place. However, North Somerset Council has responded positively to our concerns and halted development until a solution is worked out. The balancing ponds would provide an opportunity for creating new wetland habitat, thus contributing to improving biodiversity.

Funding to provide the necessary infrastructure will need to be urgently addressed as costs are likely to run to several million pounds. A strategic approach to the design of the infrastructure is urgently required. The Environment Agency and officers of the North Somerset Council have now agreed a joint approach is necessary to identify both the works required and the means of funding them. Works will be required to both the drainage infrastructure and the River Banwell in order to resolve the issue.

Our Planning Liaison section review and comment on all planning applications which have environmental implications. Nationally we are conducting a one-year trial audit of the take-up of our requirements in a 10% random sample of those applications to which we object, or ask for conditions to be attached.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
9.1.1 Agree a strategic and environmentally sustainable plan for the drainage and flood prevention infrastructure for all proposed and future land use allocations within the River Banwell and Uphill Great Rhyne catchments.	Agency, North Somerset Council	Unknown	●	●	●		
9.1.2 Negotiate appropriate tidal defence provision and adopt for maintenance when acceptable, in the Portishead Action Area.	Agency, North Somerset Council, Developer	Nil	●	●	●		
9.1.3 Negotiate the provision of a strategic surface water disposal system for the Portishead Action Area.	Agency, North Somerset Council, Developer	Unknown	●	●	●		
9.1.4 Negotiate with interested parties an integrated strategy for linking land use and coastal defence for the North Somerset coast.	Agency, North Somerset Council, IDB	Unknown	●	●	●	●	●
9.1.5 Negotiate with interested parties an integrated approach to developers on drainage issues in the North Somerset Council Area.	Agency, Water Companies, IDBs, North Somerset Council	Unknown	●	●	●	●	●
9.1.6 Improve the environmental awareness of local councillors and developers (see also 5.1.6).	-	-	-	-	-	-	-

For actions 9.1.4 and 9.1.5 the Agency, in accordance with the aims of sustainable development and land use planning, will aim to ensure through the Local Planning Authority that all necessary flood protection works are incorporated into new development.

9.2 Soil erosion

This is not a major problem in this plan area but we are concerned about possible soil erosion on the Mendips if the intensive outdoor rearing of pigs spreads into this catchment.

We encourage farmers to follow the Ministry of Agriculture, Fisheries and Food (MAFF) Code of Good Agricultural Practice for the Protection of Soil. MAFF are preparing a Code of Good Practice for outdoor pig farming which is likely to include advice on stocking ratios.

In addition low water levels in the peat soils of the moors cause irreversible breakdown of the soil structure and lead to their more rapid erosion.

9.3 Nitrate pollution

We are concerned that excess organic and inorganic nitrogen-based fertilisers applied to farmland are either polluting watercourses as surface runoff or percolating through the soil and permeable rock to pollute groundwater. This can sometimes lead to the closure of drinking water supplies, or to surface waters becoming eutrophic.

As required by the EC Nitrates Directive, the Government has designated Nitrate Vulnerable Zones (NVZ) to protect groundwaters and surface waters (affected by nitrate pollution from agricultural sources). The Agency will implement an Action Plan of agricultural measures in NVZs to achieve reductions in nitrate inputs to the land. There are no NVZs in this catchment at present. The Directive requires a review of zones every four years. One such review is currently taking place (1998).

We are concerned that excess nitrate may be contributing to the possible eutrophication of certain watercourses in the North Somerset Rivers Catchment (see 8.2.2 and 8.2.3). Other actions to reduce nitrate pollution are included in 8.4.2.

9.4

Contaminated and derelict land

The Environment Agency will from July 1999 have specific duties under the Environment Act 1995 with respect to contaminated land. This is defined as any land which appears to a local authority to be in such a condition - because of the substances it contains - that water pollution or significant harm is being, or is likely to be caused. This interpretation is subject to guidance issued by the Secretary of State. Some sites may become designated as 'special sites', and these will become the responsibility of the Agency.

At present, most contaminated land sites are remediated either at the time of redevelopment, with controls exercised through the planning process, or voluntarily, as site owners seek to reduce their own liabilities. The Environment Agency supports the UK approach for dealing with risks to health and the environment, which takes into account the actual or intended uses of the site. This 'suitable for use approach' concentrates resources where most needed, and supports the principle of sustainable development by encouraging remediation techniques for treating contaminated materials to render them less harmful, be they chemical, physical or biological. Thereby, 'brownfield' damaged land can be returned to beneficial use and help to conserve land as a resource.

The process of identifying contaminated land in a standard way across England and Wales has yet to commence. Once it does, the Agency has a duty to prepare and publish a report on the state of contaminated land from time to time, or if specifically requested to do so by the Secretary of State.

Periodic surveys have, however, been made of derelict land (which is not the same as contaminated land). Derelict land is considered to be land which has become so damaged by industrial or other developments that it is incapable of beneficial use without treatment. Such land includes closed and disused waste tips; worked-out mineral excavations which are not subject to enforceable planning conditions or other arrangements providing for restoration; abandoned military or service installations; abandoned industrial installations; and areas of land which are affected by actual surface collapse resulting from disused underground mining operations.

9.5

Soil acidification

Some soils, particularly those which are naturally acidic such as granite-derived soils and peat soils, are vulnerable to increased acidity. This effect is made worse by high rainfall, typically in upland areas, and also by extensive conifer plantations. If rain combines with certain airborne pollutants it becomes much more acidic and accelerates the process of soil acidification (see Section 4 - Air Quality).

The main emissions responsible for acid deposition are sulphur dioxide and oxides of nitrogen. Ammonia, which arises mainly from agriculture, also plays a part. In some parts of the UK, natural ecosystems have a significant capacity to neutralise acidity and acid deposition has little impact on them, but in acid-sensitive areas, acid rain degrades the land and causes damage to plants and soils in which they grow. Acid rain components which contain nitrogen have the effect of acting as a fertiliser; this can change the make up of communities of land and water plants and affect animals that live on them.

The acidification of soil also leads to the leaching out of minerals essential for plant growth, and to leaf damage. Many plants cannot survive - others are severely damaged. The North Somerset Rivers Catchment contains some small areas which exceed the critical load - the rates of sulphur deposition which ecosystems and other targets can tolerate in the long term without suffering damage. For soil acidity, see Consultation Report, page 39 Map 10.

In 1994, a protocol was agreed under the UN Economic Commission for Europe (UNECE) to reduce exceedences of critical loads (the rates of sulphur deposition which ecosystems and other targets can tolerate in the long term without suffering damage). The UK agreed to reduce its sulphur dioxide emissions by 80% from a 1980 baseline by 2010.

The UK's sulphur strategy published in December 1996 (Reducing Emissions of Sulphur Dioxide, A Strategy for the United Kingdom) indicates that the UK will meet interim targets for 2000 and 2005. Compliance is also expected with the 80% reduction target for 2010. Critical load exceedences, however, will continue at some sensitive sites. In January 1997 the European Commission published a draft strategy on acidification which aims to further reduce critical load exceedences for both sulphur and nitrogen (see Section 4 - Air Quality).

There are no breaches of air quality standards known to be caused by authorised Integrated Pollution Control (IPC) processes in the catchment. Further local reductions in emissions are planned (see Section 4 - Air Quality) and also reductions at Avonmouth and in South Wales, where heavy industry produces emissions to air which may contribute to acid rain.

10. Waste

The Environment Agency regulates the treatment, recovery, storage, movement and disposal of controlled waste. Controlled waste consists of household, commercial and industrial wastes. It excludes waste from agricultural, mining and quarrying operations, waste water, explosives and radioactive wastes.

- Local authorities produce Local Waste Plans which examine the land-use aspects of locating waste management facilities and the demand for sites within the area of the plan. They also produce Waste Disposal Plans which examine the types of facility needed and set out a strategy for disposal in the area.

The Government's current strategy for sustainable waste management in England and Wales is set out in a White Paper *Making Waste Work*, published in December 1995. This sets out the waste hierarchy:

- Reduction
- Reuse
- Recovery - recycling, composting, energy
- Disposal.

The overall objective is to move the management of waste up the hierarchy, thus reducing the volume of waste that is finally disposed to landfill. Landfill, however, will remain as a method of solid waste disposal in the UK for wastes that cannot be recovered and for the residue of some recovery methods, such as incineration with energy recovery.

Government initiatives to move waste management up the hierarchy include legislative as well as financial incentives. Mechanisms already in place include: the requirement on local authorities to draw up Recycling Plans to detail how household recycling targets are to be met; and the Landfill Tax, which was introduced on 1st October 1996. The Producer Responsibility Obligations (Packaging Waste) Regulations were introduced in March 1997.

The Landfill Tax is enforced by HM Customs and Excise. There are two levels of tax, £2 per tonne for inactive (inert) wastes and £7 per tonne for all other wastes disposed of at landfill sites. The Government have recently announced that the latter figure will increase to £10 per tonne from April 1999. Landfill Tax is levied on the landfill site operators and before VAT is calculated. Site operators can contribute to enrolled Environmental Bodies for specific projects. In return they can claim a tax credit worth 90% of any contribution up to a maximum credit of 20% of their Landfill Tax liability.

The Producer Responsibility Obligations (Packaging Waste) Regulations 1997 are the first of a new breed of regulations to ensure that waste is recovered and recycled. These regulations place an obligation to recover and recycle certain amounts of packaging waste, based on the packaging that companies handle. Currently only companies with an annual turnover of more than £5 million, and that handle over 50 tonnes of packaging each year, are obligated; from the year 2000 the turnover threshold comes down to £1 million per year. Overall the target set by the parent EU Directive is for 50% of the United Kingdom's packaging waste to be recovered by the year 2001. Obligated companies are required to gather evidence to show that their targets have been met, and it is our job to ensure that these companies have correctly declared the packaging they handle and that they have achieved their targets. Failure to correctly declare information is a criminal offence. The regulations also encourage waste minimisation and reuse as the less 'one trip' packaging you use, the smaller your obligation becomes. Further candidates for Producer Responsibility are end-of-use vehicles and waste electrical goods.

The National Waste Arisings Survey will provide the information for the National Waste Strategy, due for production in 1999. It will be carried out using stratified statistical sampling of a range of local firms. The Strategy will be the national Government's statutory strategy on waste management for all local authorities and other public bodies. It will provide definitive guidance on best practice for waste minimisation and disposal.

The National Waste Arisings Survey is due to commence in autumn 1998 and will be carried out by the Environment Agency. The survey will produce national waste arisings figures and from these estimates will be made of the waste arisings within each District or Unitary Authority area. This information will be available for local authorities to plan for waste collection and disposal and will also be available for any other organisation or the general public.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 14 waste management actions, 9 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 provide a high-quality waste regulation service;
- 2 develop an overall database of waste arisings and disposals;
- 3 obtain information on fly-tipping and devise means of combating it;
- 4 implement the 'producer responsibility' regulations;
- 5 encourage and inspire industry to develop new and improved techniques for the management of special and other industrial wastes;
- 6 ensure achievement of National Waste Strategy targets for the reduction of waste disposed of to landfill;
- 7 ensure achievement of national targets for the recovery, recycling and composting of municipal waste;
- 8 secure high quality management of radioactive waste in industry;
- 9 ensure that any proposals for solid radioactive waste disposal will provide the necessary high level of protection for man and the environment.

The North Somerset Rivers Catchment is largely coincident with the North Somerset Council area, which is going through the waste planning process at the moment, with its Waste Local Plan out to consultation at the beginning of May 1998 and a draft Waste Disposal Plan due for consultation in November 1998. We act as statutory consultees for both Plans.

The North Somerset Waste Disposal Plan will be using data collected by the former Avon County Council in their waste arisings survey produced for the Avon Waste Management Plan published in March 1996.

We support *Making Waste Work* and other Government and local initiatives and programmes, such as the Environmental Technology Best Practice Programme sponsored jointly by the DTI and the DETR, and we are committed to providing the best advice and encouragement for local authorities and business.

The National Waste Survey will provide an excellent opportunity to advise companies on the new waste packaging regulations together with waste, energy and raw material minimisation.

Actions	Action By	Cost to Agency (£K)	Financial Year				
			98	99	00	01	02
10.1.1 Contribute to National Waste Survey by collecting data in this plan area.	Agency	5	●	●			
10.1.2 Use consultants to investigate the impact on Cold Bath Spring of Hartcliffe Rocks and Dial Quarry landfills, investigate other possible sources of pollution and produce an action plan. In 1998 prepare the contract for tenders.	Agency, Bristol Water, site owners, operators	10.5	0.5	10			
10.1.3 Implement the action plan for Cold Bath Spring.	Agency, site owners, operators	30				●	

11. Major Industry

One of the Agency's key responsibilities is Integrated Pollution Control (IPC). This process aims to prevent pollutants from major industrial processes being released into the air, water and land. Where releases do occur, we try to make sure they are minimised and made harmless. Regulations made under Part 1 of the 1990 Act identify industrial processes that use or produce potentially harmful substances in significant amounts - known as prescribed processes and substances. Broadly, these are the industrial processes with the greatest potential to cause pollution. The UK was one of the first countries in Europe to introduce such an integrated regulatory system, and many individual processes have now been authorised. A similar approach will be introduced throughout the European Union under the new Integrated Pollution Prevention and Control Directive, which must be transposed into UK law by 31 October 1999.

The IPPC Directive requires members to prevent, or where that is not possible, to reduce pollution from a range of industrial and other installations, by means of an integrated permitting process based on the application of 'best available techniques'. The integrated approach takes a wide range of environmental impacts into account - emissions of pollutants to air, water and land; energy efficiency; consumption of new materials; noise; and site restoration - with the aim of achieving a high level of protection for the environment as a whole. Permits must take into account local environmental conditions at the site concerned; its technical characteristics; and its geographical location. Conditions must be included to address any transboundary pollution from an installation and also to ensure, where necessary, that any environmental quality standard laid down in Community legislation is not breached.

The IPC approach to pollution control considers releases to all three media (air, water and land) from industrial processes in the context of their effect on the environment as a whole. The option of minimising impact on the environment as a whole is known as the best practicable environmental option (BPEO). Guidance on how to conduct such an appraisal is provided in the Agency's free publication *Best Practicable Environmental Option Assessments for IPC: A Summary*.

In addition, processes have to use the best available techniques not entailing excessive cost (BATNEEC) to prevent or minimise releases of prescribed substances into the environment and render all substances harmless.

Before IPC was introduced, releases of prescribed substances to the different environmental media (air, water and land) were dealt with under distinct sets of rules, enforced by separate regulators. This meant that industries barred from releasing hazardous pollutants into one environmental medium (such as to water in the nearest river) might be able to divert them into another medium where perhaps less stringent rules applied (such as to air by burning or to land by burying them). There was no means of ensuring that industry acted in the way that caused least harm to the environment as a whole.

Where an IPC authorisation does not cover the whole of a site, operators may also be subject to separate regulatory permits for aspects of Waste and Water Quality. However, the amalgamation within the Agency of the responsibility for regulations governing those aspects as well as IPC has been a further significant step in ensuring a consistent approach to environmental management.

The Environment Agency is also the enforcement authority for England and Wales of the Radioactive Substances Act 1993. This statute is concerned with the keeping, use and disposal of radioactive substances and, in particular, the regulation of radioactive waste disposal. We will prosecute where breaches of a Radioactive Substances authorisation occur.

The major nuclear establishments are licensed to operate by the Nuclear Installations Inspectorate (NII), but discharges from them are authorised by the Agency. These discharges arise from the day-to-day operations at the sites. Site operators are required to ensure that discharge conditions are met and also ensure that radiation dose limits to the public are not exceeded as a result of the discharges.

There are 17 sites (see Consultation Report, page 81, table 16) in the catchment area which are currently registered under the Radioactive Substances Act. These sites are mainly manufacturing processes using sealed radioactive sources for industrial process control purposes.

The Control of Major Accident Hazards (COMAH) Regulations are needed to implement the Seveso II Directive which will replace European Directive 82/501/EEC (the Seveso Directive) on the major accident hazards of certain industrial activities. Its aim is to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any that do occur.

The Seveso II Directive retains the basic principles of major accident hazard control which underpin the Seveso Directive but addresses some weaknesses and omissions which have become apparent over the years it has been in force. The new Directive:

- places a greater emphasis on the need for effective safety management systems;
- puts specific duties on competent authorities (regulators) which should help ensure that the Directive is implemented consistently across all EU member states;
- recognises the need for land-use planning controls for new major hazard sites and on developments (such as housing) in their vicinity;
- removes various exemptions, such as chemical hazards at nuclear installations, and explosives;
- simplifies application criteria; and
- is more flexible and allows for easy amendment in some areas.

The Agency's 'An Environmental Strategy for the Millennium and Beyond' (published September 1997) details 18 actions to regulate major industries, 14 of which we are contributing to in the North Somerset Rivers Catchment, and these are listed below.

Locally we will:

- 1 continue the efficient and effective delivery of Integrated Pollution Control;
- 2 implement the requirements of the European Community (EC) Directive on Integrated Pollution Prevention and Control;
- 3 implement the relevant requirements of the Control of Major Accident Hazards Directive;
- 4 develop practical working relationships with fellow regulators, particularly the Health and Safety Executive;
- 5 develop pollution prevention control tools including projects relating regulation to emission, efficiency and economic benefits (3 Es project);
- 6 encourage the use by industry of BS 7750/ISO14001 accreditation;

- 7 encourage registration under the European Union (EU) Ecomanagement and Audit regulations;
- 8 pay special attention to the needs of small and medium sized enterprises;
- 9 maintain and expand the Chemical Release Inventory;
- 10 play a full and active part in the EU Network for the Implementation and Enforcement of Environmental Law;
- 11 ensure that radioactive releases from nuclear sites which result in exposures to individual members of the public are well within accepted limits;
- 12 ensure that the total potential impact of releases from nuclear sites is environmentally acceptable;
- 13 ensure improvements are made to the quality of discharges to estuarine and coastal waters;
- 14 implement the requirements of the EC Urban Waste Water Treatment Directive.

Actions to regulate major industry are included in Section 3 - Climate Change and Section 4 - Air Quality.

12. Appendices

12.1 Our River Quality Objective targets (RQO)

River	Stretch Name	Stretch Ref No.	River Quality Objectives
Banwell	Banwell-M5	1	RE4
	M5-Sea	2	RE4
River Yeo	Blagdon Lake-Perry Bridge	3	RE3 LT RE2
	Perry Bridge-Wrington	4	RE2
	Wrington-Congresbury	5	RE2
	Congresbury-M5	6	RE3
	M5-Icelton (Estuary)	7	RE2
Kenn	Source-Sea	8	RE4
New Blind Yeo	Cut From Kenn-Clevedon	9	RE4
	Clevedon-Sea	10	RE4
Land Yeo	Source-Clevedon	11	RE2
	Clevedon-Sea	12	RE5
Portbury Ditch	Source-Middle Bridge	13	RE4
	Middle Bridge-Sea	14	RE4

12.2 Area Environment Group

Name	Representing
Mr L R Fortune	Chairman, Appointed by Environment Agency
Ms B Carroll	Regional Environment Protection Advisory Committee
Mr M J Stoodley	Wessex Regional Fisheries Advisory Committee
Mr J R Bush	Wessex Regional Flood Defence Committee
Mr R W Wyatt	Water Resources
Mr S Hemmings	Waste Management
Mr M Hellings	Waste Management
Mr D Fish	Industry
Mr H S Lucas	Industry
Councillor N Jones OBE	Tourism
Mr R G Adlam	Agriculture
Ms J C Brookhouse	Conservation
Mrs A M Lennox	Recreation
Mr J L R Williams	Fisheries
Mr J B H Watkis	Flood Defence
Mrs L Bennett	Local Authority
Mrs N E Kirsan	Local Authority
Mr H P N Temperley	Local Authority
Mr C S W C Newbury	Local Authority
Dr R England	Education

12.3

Steering Group

Name	Representing
Miss A Brimble*	North Somerset Council (Community Leisure)
Mr S Brooks	Monaghan Middlebrook Mushrooms Ltd
Mr J Comer	Country Landowners Association
Mrs C Dring	North Somerset Council (Planning)
Mr B Greenwood	English Nature
Mr J Harris	Somerset Local Flood Defence Committee
Mr J Hayward	British Canoe Union
Mr R Henley*	The Bristol Port Company
Mr P Hodge	Bristol Water Company
Mr T McGrath	Avon Wildlife Trust
Mr R Osmond	Vice-Chairman West Mendip Internal Drainage Board
Mr J Purchase	Clevedon Angling Club
Mr M Venning	Wessex Water Plc

* Resigned following the meeting to discuss the final draft of the Action Plan held on 31 July 1998. Two vacancies now exist.

12.4

Organisations responding to the public consultation

National Organisations	Local Authorities/Parish Councils
Clean Rivers Trust	North Somerset Council (x 2)
The Ramblers' Association	Sedgemoor District Council
British Trust for Ornithology	Nailsea Town Council
The Coal Authority	Long Ashton Parish Council
Institute of Hydrology	Wick St Lawrence Parish Council
The Inland Waterways Association	Portishead & North Weston Town Council
MAFF	Kingston Seymour Parish Council
British Canoe Union	Winscombe & Sandford Parish Council
The Hawk & Owl Trust	Portbury Parish Council
	Wraxall & Failand Parish Council
	Clevedon Town Council
Regional and Local Organisations	
Wessex Water	Forest Enterprise
The Forestry Commission (Exeter)	The Forestry Commission (Severn Wye & Avon)
Gordano Valley IDB	North Somerset IDB
West Mendip IDB	Forest of Avon
Clevedon & District Freshwater Angling Club	FRCA
RSPB	Uphill Village Society
Clevedon Natural History Society	Bristol Water
CLA	OFWAT
The Ramblers' Association (Avon Area)	CPRE (Avon & North Somerset Branches)
Friends of Biddle Street SSSI	Community Action

A further 12 written responses were also received from members of the public.

A copy of the summary report can be obtained by writing to Alan Turner, Team Leader LEAPs (see address inside front fold-out map).

12.5 Guide to Consultation Report and Action Plan issues

Former Consultation Report Issue		Heading number in this Action Plan
4.1	Development Pressure	
4.1a	Produce a strategic plan for the infrastructure for the drainage of the Locking Castle developments into the River Banwell.	9.1.1
4.1b	Negotiate appropriate tidal defence provision and adopt for maintenance when acceptable, in the Portishead Action Area.	9.1.2
4.1c	Negotiate the provision of a strategic surface water disposal system for the Portishead Action Area.	9.1.3
4.1d	Negotiate with interested parties an integrated strategy for linking land use and coastal defence for the North Somerset coast.	9.1.4
4.1e	Negotiate with interested parties an integrated approach to developers on drainage issues in the North Somerset Council Area.	9.1.5
4.1f	Work in partnership with North Somerset Council to improve their environmental protection policies and work towards a more sustainable type of development.	9.0
4.1g	Enforce discharge consents and IPC authorisations, and where necessary review.	Ongoing
4.1h	Work with Wessex Water Services Ltd (WWSL) to prioritise their expenditure at STWs.	8.0
4.1i	Work with water supply companies to prioritise expenditure on water resource management and development.	5.1.4
4.1j	Survey waste arisings in the catchment area to provide a basis for waste planning.	10.1.1
4.1k	Advise waste disposal authorities and local industry on the best practice for waste minimisation and disposal. Enforce the new Producer Packaging Regulations.	10.0
4.1l	Seek the earliest possible discussions with new developers and the local planning authorities to advise on the best environmental options for proposed developments, including flood alleviation measures.	9.0
4.2	Inadequate Flood Defences	
4.2a	The Agency will encourage the promotion of schemes and in conjunction with others consider options for funding. Note: Shoreline Management Plans are reviewing coastal defence options (see Section 17.5).	9.1
4.2b	Advise North Somerset Council strategic planners on flood defence matters e.g. fluvial defences at Congresbury, for their input to Strategic and Local Plans.	9.1
4.3	Maintaining and Enhancing Biodiversity	
4.3a	Work with North Somerset Council on their forthcoming BAP.	6.1.2
4.3b	Continue to support the North Somerset Levels and Moors Project.	6.0
4.3c	Rhynes and ditches (and associated species of plants and invertebrates) - work closely with partners in the North Somerset Levels & Moors Project to promote appropriate water quality and biological conditions across the area.	6.0
4.3d	Reedbeds - assist in habitat creation schemes.	6.1.4
4.3e	Fen meadows and raised mire communities - continue national programme to reduce emissions of sulphur and nitrogen oxides from major power plants. Continue to support monitoring of species communities with partner organisations, and formulate action plan.	4.1.1 & 6.0
4.3f	Lowland wet grassland - participate in the production of Water Level Management Plans.	6.1.3
4.3g	Tufa depositing springs and headwater streams - survey to assess value and develop conservation strategy.	6.1.5
4.3h	Water-voles - increase our knowledge of distribution and investigate the main reasons for the absence of water-voles from large areas of the catchment.	6.1.6
4.3i	Otters - assist with the monitoring of otter populations, establish otter corridor links to adjacent catchments through habitat creation, establish water quality objectives necessary to maintain otter populations, analyse tissue of road casualties.	6.1.7/8/9/ 10

Former Consultation Report Issue		Heading number in this Action Plan
4.3j	Native crayfish - continue to support survey work to enable the formulation of a conservation strategy.	6.1.12
4.3k	Eels - implement recommendations of Barriers to Migration survey (see Section 12 Consultation Report).	6.1.14
4.3l	Barn owls - provide and monitor nest boxes and manage habitat to encourage voles on Agency-owned land.	6.1.11
4.3m	Invasive plants - continue to assess the overall problem. Control any causing an obstruction to flood flow and take measures to prevent spread from our own land.	6.1.15
4.4	The Decline in Water Quality	
4.4a	Upgrade RQO for the stretch: River Land Yeo - Clevedon to sea, from RE5 to RE4.	8.1.1
4.4b	A full review of all factors affecting water quality on those stretches with RE4 and RE5 as proposed objectives.	8.1.2
4.5	The Impact of River Regulation, Penning and Nutrient Enrichment	
4.5a	Review control of penning structures.	8.2.4
4.5b	Avoid water losses by efficient use of the irrigation network on the levels and moors.	Dropped
4.5c	Address acute water quality problems by short term measures such as aeration to increase dissolved oxygen levels.	Dropped
4.5d	Establish the frequency of algal blooms, the extent of eutrophic effects and the source of excess nutrients.	8.2.1
4.5e	Review control of penning structures (duplicate of 4.5a).	8.2.4
4.5f	Work with others to reduce nutrient levels by controlling point sources and diffuse agricultural pollution (see Issue 4.8).	8.2.2
4.5g	Promote the creation of buffer strips to take up excess fertiliser runoff.	8.2.2
4.5h	Control spreading of waste to land to prevent runoff to rivers.	8.2.3
4.5i	Draw up memoranda of understanding with others such as Internal Drainage Boards (IDBs), water companies and conservation bodies to secure wise use of resources.	Dropped
4.5j	Carry out R&D to investigate the effect of river control structures on fisheries.	7.1.1
4.5k	Improve understanding and control of the drainage system to ensure best use of the available resources and, where appropriate, minimise the diversion of water from the principal rivers and drains during dry weather. This may be achieved by Water Level Management Plans (WLMPs).	8.2.4
4.5l	Consider the provision of additional storage volume to provide more irrigation water.	8.2.5
4.5m	Identify opportunities for increasing the depth of winter water level.	8.2.4
4.6	The Impact of River Maintenance	
4.6a	Review flood defence maintenance and develop Flood Defence Management System.	8.3.1
4.6b	Survey assets 1997. Classify upland river reaches in accordance with the SoS (see Section 17.4 Consultation Report).	8.3.2
4.6c	Review the Somerset Levels & Moors Strategy to possibly include the North Somerset Levels and the Gordano Valley.	Dropped
4.6d	The current state target standards of flood protection will be compared to and differences addressed in 1998 (see Section 17.4 Consultation Report).	8.3.3
4.6e	Seek resources to re-engineer channels and floodbanks to provide a more natural shape as need or opportunity arises (see Section 10.7 Consultation Report).	8.3.4
4.6f	Examine current weed removal practices to reduce risk of fish kills, and provide benefits for wildlife conservation.	8.3
4.6g	Explore tree planting opportunities to provide shade and reduce the need for aquatic weed cutting as appropriate sites are identified (i.e. sites where maintenance access is not blocked and with the riparian owner's agreement).	8.3.5

Former Consultation Report Issue		Heading number in this Action Plan
4.6h	Establish a study group with interested parties to investigate options for water level management and the funding of changed arrangements for the River Kenn downstream of Kenn Pier (see Issue 4.4).	Dropped
4.6i	With interested parties establish an Action Group to plan actions and their implementation including funding for the Land Yeo in Clevedon and the Uphill Great Rhyne.	Dropped
4.6j	Investigate the impact of weedcutting and other maintenance work on biological quality on the River Yeo and water quality on the Portbury Ditch and draw up an improved maintenance strategy.	8.3
4.7	The Impact of Landfill Activities on Cold Bath Spring Public Water Supply Source	
4.7a	Continue to monitor groundwater in all boreholes around Hartcliffe Landfill and monitor the Cold Bath Spring public water supply source.	10.1.2
4.7b	Investigate whether or not Dial Landfill has an impact on the quality of Cold Bath Spring.	10.1.2
4.7c	Investigate any other possible sources of contamination including the supply conduit between Chew Valley and Barrow Gurney.	10.1.2
4.7d	Use the information from the monitoring to draw up a remedial plan for the source.	10.1.3
4.8	The Impact of Agricultural Discharges and Runoff	
4.8a	Install automatic monitors on the Land Yeo downstream of suspected discharges.	8.4.1
4.8b	Revisit all suspected farms to ensure that farm waste management is effective.	8.4.2
4.8c	Take enforcement action against farms who discharge illegally.	8.4.2
4.8d	Promote good agricultural practice with other bodies.	8.4
4.9	The Impact of Mushroom Farming	
4.9a	Ongoing negotiations to ensure that storage volumes match the volume of effluent produced.	Ongoing
4.9b	Monitor the discharge and Langford Brook to check the effectiveness of the new arrangements.	8.4.3
4.10	The Impact of the Unconsented Discharge from the Water Treatment Works at Barrow Reservoirs	
4.10a	Continue discussions with Bristol Water to decide which of the two options should be pursued: i) determine a Consent to Discharge or ii) recycling i.e. no discharge.	8.5.1
4.10b	Continue monitoring downstream to ensure that an unconsented discharge is not occurring.	8.5.2
4.11	The Impact of the Lack of Compensation Flow from Barrow Reservoirs	
4.11a	Monitor the effects of the lack of flow and enter into discussions with Bristol Water with a view to examining the feasibility of securing a flow downstream of Barrow Reservoir.	8.5.3
4.11b	Investigate impacts on water quality, river ecology, and fisheries and produce a report.	8.5.3
4.12	Use of Environment Agency Owned Land	
4.12a	Complete our Blind Yeo Conservation and Recreation Management Plan.	8.6.1
4.12b	Help to develop riparian footpaths particularly in and around towns, and cycling routes where appropriate, in partnership with others.	8.6
4.12c	Develop better access to watercourses where the Agency owns the land.	8.6

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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
<p>Water Resources The Agency has a duty to conserve, redistribute, and secure the proper use of water resources.</p>	<ul style="list-style-type: none"> ● Grant or vary water abstraction and impoundment licences on application. ● Revoke or vary existing licences to reinstate flows or levels to surface waters or groundwater which have become depleted as a result of abstraction, and are subject to a liability for compensation. 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● The Agency is committed to water-demand management and will work closely with water companies and developers, local authorities and relevant organisations to promote the efficient use of water. The Agency acknowledges that new resources may be needed in the future and supports a twin-track approach of planning for water resource development alongside the promotion of demand-management measures. The Agency seeks to influence planning decisions for new development by encouraging the inclusion of water conservation measures in new properties, particularly in areas where water resources are under stress, and by ensuring that planning authorities allow for the lead time for resource development.
<p>Flood Defence The Agency has a duty to exercise general supervision over all matters relating to flood defence throughout each catchment.</p>	<ul style="list-style-type: none"> ● Control, through Land Drainage consents, development within 8 m of main river (16 m for tidal Thames and tributaries) (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 Section 105 of Water Resources Act 1991. 	<ul style="list-style-type: none"> ● 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 e.g. flood attenuation structures. 	<ul style="list-style-type: none"> ● As a statutory consultee on planning applications within main river floodplains the Agency offers advice based on knowledge of flood risk. It also advises on the environmental impacts or proposed floodplain development. ● The Agency will encourage best practice, including source control measures and common standards, among local authorities and riparian owners to protect and enhance the environment.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
<p>Flood Defence (cont.)</p>	<ul style="list-style-type: none"> ● Undertake works to main rivers using permissive powers. ● Issue flood warnings relating to main river to the public, local authorities and the police. ● Consent mineral working within 16 m of main rivers. 	<ul style="list-style-type: none"> ● 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. 	<p>The Agency works with the civil authorities to prepare flood warning dissemination plans and supports their endeavours to protect communities at risk.</p>
<p>Water Quality The Agency has a duty to monitor, protect, manage and, where possible, enhance the quality of all controlled waters including rivers, groundwaters, lakes, canals, estuaries and coastal waters through the prevention and control of pollution.</p>	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● The control of runoff from roads and highways. This is a Highways Agency duty. ● The greater use of source control measures to reduce pollution by surface water runoff. ● Prevention and education campaigns to reduce pollution incidents. 	<ul style="list-style-type: none"> ● 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.
<p>Air Quality The Agency has a duty to implement Part 1 of the Environment Protection Act 1990.</p>	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● The vast number of smaller industrial processes which are controlled by local authorities. ● Control over vehicular emissions and transport planning. 	<ul style="list-style-type: none"> ● The Agency provides data on IPC processes and advice on planning applications to local authorities. The Agency is willing to offer its technical experience to local authorities on the control of air pollution. The Agency wishes to liaise with local authorities in the production of their Air Quality Management Plans. The Agency will advise and contribute to the Government's National Air Quality Strategy.
<p>Radioactive Substances The Agency has a duty under the Radioactive Substances Act 1993 to regulate the use of radioactive materials and the disposal of radioactive waste.</p>	<ul style="list-style-type: none"> ● To issue certificates to users of radioactive materials and disposers of radioactive waste, with an overall objective of protecting members of the public. 	<ul style="list-style-type: none"> ● The health effects of radiation. 	<ul style="list-style-type: none"> ● The Agency will work with users of the radioactive materials to ensure that radioactive wastes are not unnecessarily created, and that they are safely and appropriately disposed of. The Agency will work with MAFF to ensure that the disposal of radioactive waste creates no unacceptable effects on the food chain.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
Radioactive Substances <i>(cont.)</i>			<ul style="list-style-type: none"> ● The Agency will work with the Nuclear Installations Inspectorate to ensure adequate protection of workers and the public at nuclear sites. The Agency will work with the HSE on worker protection issues at non-nuclear sites.
Waste Management The Agency has a duty to regulate the management of waste, including the treatment, storage, transport and disposal of controlled waste, to prevent pollution of the environment, harm to public health or detriment to local amenities.	<ul style="list-style-type: none"> ● Vary waste management licence conditions. ● Suspend and revoke licences. ● Investigate and prosecute illegal waste management operations. 	<ul style="list-style-type: none"> ● 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. 	<ul style="list-style-type: none"> ● The Agency will work with waste producers, the waste management industry and local authorities to reduce the amount of waste produced, increase reuse and recycling and improve standards of disposal.
Contaminated Land The Agency has a duty to develop an integrated approach to the prevention and control of land contamination, ensuring that remediation is proportionate to risks and cost-effective in terms of the economy and environment.	<ul style="list-style-type: none"> ● Regulate the remediation of contaminated land designated as special sites. ● Prevent future land contamination by means of its IPC, Water Quality and other statutory powers. ● Report on the state of contaminated land. 	<ul style="list-style-type: none"> ● Securing with others, including local authorities, landowners and developers, the safe remediation of contaminated land. 	<ul style="list-style-type: none"> ● The Agency supports land remediation and will promote this with developers and local authorities and other stakeholders.
Conservation The Agency will further conservation, wherever possible, when carrying out water management functions; have regard to conservation when carrying out pollution control functions; and promote the conservation of flora and fauna which are dependent on an aquatic environment.	<ul style="list-style-type: none"> ● The Agency has no direct conservation powers but uses its powers with regard to water management and pollution control to exploit opportunities for furthering and promoting conservation. 	<ul style="list-style-type: none"> ● 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 1 habitat. 	<ul style="list-style-type: none"> ● 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.

Agency Duty	The Agency has powers to:	The Agency has an interest (but no powers) in:	Partnership
<p>Landscape The Agency will further landscape conservation and enhancement when carrying out water management functions; have regard to the landscape when carrying out pollution control functions; and promote the conservation and enhancement of the natural beauty of rivers and associated land.</p>	<ul style="list-style-type: none"> ● The Agency must further the conservation and enhancement of natural beauty when exercising its water management powers and have regard to the landscape in exercising its pollution control powers. 	<ul style="list-style-type: none"> ● The landscape impact of new development, particularly within river corridors. This is controlled by local planning authorities. 	<ul style="list-style-type: none"> ● 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.
<p>Archaeology The Agency has a duty to consider the impact of all of its regulatory, operational and advising activities upon archaeology and heritage, and implement mitigation and enhancement measures where appropriate.</p>	<ul style="list-style-type: none"> ● The Agency must promote its archaeological objectives through the exercise of its water management and pollution control powers and duties. 	<ul style="list-style-type: none"> ● Direct protection or management of sites of archaeological or heritage interest. This is carried out by local planning authorities, County Archaeologists and English Heritage. 	<ul style="list-style-type: none"> ● 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.
<p>Fisheries The Agency has a duty to maintain, improve and develop salmon, trout, freshwater and eel fisheries.</p>	<ul style="list-style-type: none"> ● Regulate fisheries by a system of licensing. ● Make and enforce fisheries byelaws 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. 	<ul style="list-style-type: none"> ● The determination of planning applications which could affect fisheries. 	<ul style="list-style-type: none"> ● Many development schemes have significant implications for fisheries. The Agency will work with anglers, riparian owners, developers and local authorities to protect fisheries.
<p>Recreation The Agency has a duty to promote rivers and water space for recreational use.</p>	<ul style="list-style-type: none"> ● The Agency contributes towards its recreation duty through the exercise of its statutory powers and duties in water management. 	<ul style="list-style-type: none"> ● Promotion of water sports. This is carried out by the Sports Council and other sports bodies. 	<ul style="list-style-type: none"> ● 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.

13. Glossary Of Terms And Abbreviations

AEG	Area Environment Group
AMP	Asset Management Plan
AONB	Area of Outstanding Natural Beauty, designated by the Countryside Commission to conserve and enhance the natural beauty of the landscape, mainly through planning controls
Aquifer	A layer of water-bearing rock
AWT	Avon Wildlife Trust
BAP	Biodiversity Action Plan
BATNEEC	Best Available Techniques Not Entailing Excessive Cost
BCU	British Canoe Union
BPEO	Best Practicable Environmental Option
BRERC	Bristol Regional Environmental Records Centre
BW	Bristol Water
CLA	Country Landowners Association
CMP	Catchment Management Plan
CPRE	Council for the Preservation of Rural England
CWS	County Wildlife Site
DETR	Department of the Environment, Transport and the Regions
DO	Dissolved oxygen
DoE	Department of the Environment (predecessor of DETR)
DTI	Department of Trade and Industry
EC	European Community
EEO	Energy Efficiency Office
EN	English Nature
EPAQS	Expert Panel of Air Quality Standards
EQS	Environmental Quality Standard
ESA	Environmentally Sensitive Area
EU	European Union
FDMS	Flood Defence Management System
FoA	Forest of Avon
FRCA	Farming and Rural Conservation Agency
FWAG	Farming and Wildlife Advisory Group
HE	House Equivalents per kilometre
HNDA	High Natural Dispersion Areas
IDB	Internal Drainage Board
IPC	Integrated Pollution Control, a system introduced to control pollution from industrial processes which could cause significant pollution to air, land and water
LEAP	Local Environment Agency Plan
LPA	Local Planning Authority
LNR	Local Nature Reserve
MAFF	Ministry of Agriculture, Fisheries and Food
NETCEN	National Environmental Technology Centre
NII	Nuclear Installations Inspectorate
NNR	National Nature Reserve, a site owned or leased and managed by English Nature and established as a reserve
NO	Nitrogen oxide
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NRA	National Rivers Authority
NSA	Nitrate Sensitive Area
NSC	North Somerset Council
NSL&MP	North Somerset Levels & Moors Project
NVZ	Nitrate Vulnerable Zone
OFWAT	Office of Water Services, the Government regulatory agency for the water industry
PM10	Particulate matter in the 10 to 20 micron range

PPPG	Policy and Practice for the Protection of Groundwater
pSAC	Proposed Special Area for Conservation designated under the EC Habitats Directive
R&D	Research and Development
RAMSAR	Sites identified by UK Government under the Convention on Wetlands of International Importance which was ratified by the UK Government in 1976
RE	River Ecosystem
RSPB	Royal Society for the Protection of Birds
RQO	River Quality Objective
SAC	Special Area for Conservation designated under the EC Habitats Directive
SAM	Scheduled Ancient Monument of national importance designated under the Ancient Monuments and Archaeological Areas Act 1979
SERC	Somerset Environmental Records Centre
SMP	Shoreline Management Plan
SNCI	Site of Nature Conservation Interest
SoS	Standards of Service
SPA	Source Protection Area (Groundwater)
SPA	Special Protection Area identified by UK Government under the EC Directive on the Conservation of Wild Birds
SSSI	Site of Special Scientific Interest of national importance designated under the Wildlife and Countryside Act 1981. Habitats, sites for individual species, geology and land forms may be designated.
STW	Sewage Treatment Works
SWT	Somerset Wildlife Trust
Triassic	Geological time period
UNECE	United Nations Economic Commission for Europe
UWWTD	EC Urban Waste Water Treatment Directive
VOC	Volatile Organic Compound
WHO	World Health Organisation
WLMP	Water Level Management Plan
WOAD	Welsh Office Agriculture Department
WWSL	Wessex Water Services Ltd

14. Units

cm	centimetre	mg/m ²	milligrams per square metre per day
ha	hectare	µg/m ³	microgram per cubic metre
km	kilometre	ml	millilitre
km ²	square kilometre	MI/d	megalitres per day
l/s	litres per second	MI/y	megalitres per year
m	metre	mm	millimetre
m ³ /d	cubic metres per day	mpg	miles per gallon
m ³ /s	cubic metres per second (cumeecs)	ppb	parts per billion
mg/l	milligrams per litre	ppm	parts per million
µg/l	micrograms per litre	te	metric tonne

map 2

15. Useful Publications

- A Guide to Information Available to the Public*, Environment Agency
- Action for Biodiversity in the South-West - a series of habitat and species plans to guide delivery, June 1997 ISBN 0903138972
- Air Quality A to Z*, June 1995, Meteorological Office and Air Quality Division, Department of the Environment (DoE) ISBN 0861803175
- An Environmental Strategy for the Millennium and Beyond*, HO-9-97-100K-D-BABF
- Avalon Marshes - Countryside Stewardship Special Project Proposal, Somerset County Council *et al*, 1996
- Control of Pollution Act 1974
- Control of Pollution (Amendment) Act 1989
- DoE Circular 30/92 *Development and Flood Risk*
- EC Surface Water Abstraction Directive (75/440/EEC)
- EC Directive Concerning the Quality of Bathing Water (76/160/EEC)
- EC Directive on Pollution Caused by the Discharge of Certain Dangerous Substances into the Aquatic Environment (76/464/EEC)
- EC Directive on Freshwater Fish (78/659/EEC)
- EC Directive on the Conservation of Wild Birds (79/409/EEC)
- EC Directive on the Protection of Groundwater against Pollution Caused by Certain Dangerous Substances (80/68/EEC)
- EC Directive on Air Quality Standards for Nitrogen Dioxide (85/203/EEC)
- EC Directive Concerning Urban Waste Water Treatment (91/271/EEC)
- EC Directive Concerning the Protection of Waters Against Pollution Caused by Nitrates From Agricultural Sources (91/676/EEC)
- EC Directive on Species and Habitats (92/43/EEC)
- Environment Act 1995
- Environmental Protection Act 1990
- Environment Agency (1998) Policy and Practice for the Protection of Groundwater
- Guidance for the Control of Invasive Plants near Watercourses, Japanese Knotweed, Giant Hogweed and Himalayan Balsam. HO-9/94-20k-C-AKVI
- Health and Safety at Work Act 1974
- Land Drainage Act 1991
- NRA (1995) *Tomorrow's Water*, NRA South Western Region Water Resources Strategy. SW-4/95-1k-B-ANOQ
- NRA (1995) *Saving Water* - The NRA's Approach to Water Conservation and Demand Management. HO-9/95-1.5k-B-AQHH
- Peat Local Plan, Somerset County Council
- Radioactive Substances Act 1993
- Salmon and Freshwater Fisheries Act 1975
- Somerset County Minerals Plan, Somerset County Council
- Somerset Levels and Moors Water Level Management Strategy Review Consultation Report. SW-2/98-0.5K-E-BAVZ
- Somerset Levels and Moors Landscape Assessment for Monitoring, July 1990, MAFF
- South West Regional Pollution Prevention and Control 1997 General Quality Assessment (GQA) and River Ecosystem Non-Compliance, North Wessex Area. Water Quality Technical Series GQA/REL1G
- The Biodiversity of the South-West - an audit of the South-West biological resource, May 1996 ISBN 0903138920
- The Environment Agency and Sustainable Development - MAFF B9709 November 1996 96EP189/1
- The Environment of England and Wales - A Snapshot 1996, Environment Agency HO-4/96-5K-A-ATVT
- The Water-Vole (Arvicola terrestris) in Britain 1989-1990: Its Distribution and Changing Status*, The Vincent Wildlife Trust
- Understanding Buffer Strips* - Environment Agency HO-8/96-5K-D-AVJK
- Waste Management Strategy for Somerset, 1996
- Waste Minimisation and Recycling Directory 1998 - North Wessex Area - Environment Agency SW-1/98-5K-E-BAOT
- Water Resources Act 1991
- Wildlife and Countryside Act 1981 HO-6/94-5k-C JTG
- 1980 The Control of Pollution (Special Waste) Regulations. SI 1709
- 1986 Control of Pesticide Regulations. SI 1510
- 1989 Sludge (Use in Agriculture) Regulations. SI 1263
- 1990 Code of Practice for the Safe Use of Pesticides on Farms and Holdings. MAFF
- 1992 Code of Good Agricultural Practice for the Protection of Air. MAFF/WOAD
- 1993 The Forests & Water Guidelines
- 1993 Code of Good Agricultural Practice for the Protection of Water. MAFF/WOAD
- 1993 Code of Good Agricultural Practice for the Protection of Soil. MAFF/WOAD
- 1994 Waste Management Licensing Regulations. SI 1056
- 1995 *Making Waste Work*. Department of the Environment and The Welsh Office
- 1995 Biodiversity: the UK Steering Group Report. London, 2 Vols.
- 1996 The Special Waste Regulations. SI 972
- 1996 A Review of the Potential Effects of Climate Change in the United Kingdom. UK Climate Change Impact Review Group

MANAGEMENT AND CONTACTS:

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

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0645 333 111

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

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