

local environment agency plan

SOAR

CONSULTATION REPORT

APRIL 1997



ENVIRONMENT
AGENCY

YOUR VIEWS ~

The Local Environment Agency Plan (LEAP) process will establish a common vision for the Soar area and provide a framework for protecting and improving our local environment. It will raise local environmental issues and through partnership will direct resources to where they are most needed.

The publication of this report marks the start of a three month period of consultation. Following the consultation period the Environment Agency will produce a five year Action Plan. This will outline both the Agency's and other partners actions within the area. Annual Reviews will report on the progress being made. The LEAP process is ongoing and your voice, your involvement and commitment is requested throughout.

What do you think?

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

- * *Have all the important environmental issues been identified?*
- * *Have all the options and solutions to issues been identified?*
- * *Is the vision for the area your vision?*
- * *Do you have any other information or ideas you would like to express?*

All comments received will be treated as public information unless you explicitly state otherwise in your response.

Following the consultation period all comments received will be considered in preparing the next phase, the Action Plan. The Consultation Report will not be rewritten as part of the Action Plan process.

We intend that the plan should influence the policies and action of developers, planning authorities and other organisations as well as assisting in the day to day management of the area.

Comments on the Consultation Report should be sent to:

Alison Fisher, Environment Planner
Environment Agency
Trentside Offices
Scarrington Road
West Bridgford
Nottingham NG2 5FA

All contributions should be made in writing by 31 July 1997.






If you or your organisation need further information or further copies of this report, please contact Alison Fisher at the above address or by telephone on (0115) 9455722 - Ext 3620.



0 5km



KEY

-  Catchment/Area Boundary
-  Sub-Catchment Boundary
-  Main River
-  Ordinary Watercourse
-  Grand Union Canal
-  Built up Area

KEY DETAILS

GENERAL

<u>Area</u>	1380km ²
<u>Population (est)</u>	7 0 5 , 0 0 0

Main Areas of Population

Leicester	293,400
Loughborough	54,330
Wigston	31,970
Melton Mowbray	25,080
Oadby	21,130
Shepshed	13,650
Braunstone	12,780
Birstall	11,900
Syston	11,600

CONSERVATION

Sites of Special Scientific Interest	49
Sites of Interest for Nature Conservation	282
Scheduled Ancient Monuments	92
Local Nature Reserves	3

WATER RESOURCES

Average annual rainfall	642mm
Number of Licensed Abstractions	398
of which: surface	124
groundwater	274
plus impounding licences	12

WASTE REGULATION

Landfill sites	28
Transfer stations	38
Metal recycling stations	23
Civic amenity sites	11
Waste treatment plants	2
Incinerators	2
Sewage treatment plants	2
Storage processing	2

INTEGRATED POLLUTION CONTROL (IPC)

Part A Processes (Env. Prot. Act 1990)	11
Radioactive Substances (Sect 7)	103
Radioactive Substance (Sect 10)	16
Radioactive Substances (Sect 13)	18

WATER COMPANIES AND INTERNAL DRAINAGE BOARDS

Severn Trent Water Ltd
Anglian Water Services
Kingston Internal Drainage Board

ADMINISTRATIVE DETAILS

County Councils and Unitary Authorities:-

Leicester UA
Leicestershire CC
Nottinghamshire CC
Rutland UA
Warwickshire CCI

District/Borough Councils:-

Blaby DC
Charnwood BCI
Harborough DC
Hinckley and Bosworth DC
Melton BC
North West Leicestershire DC
Oadby and Wigston DC
Rushcliffe BC
Rugby BC

FLOOD DEFENCE

Length of Main River in plan area:219.8km
Length of floodbanks/ floodwalls maintained
by the Agency : 40km
Number of floodgates : 2

FISHERIES

Length of designated watercourse (78/659
EEC)
Salmonid 0km
Cyprinid - river 100km
Cyprinid - canal 13.6km

MONITORING WATER QUALITY

Length of watercourse in Grade (km)

<u>Quality</u>	<u>Grade</u>	<u>Chemistry</u>	<u>Biology</u>
GOOD	A	4.8	27.0
	B	215.4	80.5
FAIR	C	140.1	228.5
	D	43.2	74.1
POOR	E	3.1	7.4
BAD	F	0	0

FOREWORD

LOCAL ENVIRONMENT AGENCY PLANS (LEAPs) are action plans to protect and improve the environment for present and future generations.

This report starts the consultation process with customers, the local community and interested organisations in arriving at an **agreed** action plan for the area.

We have identified key environmental issues affecting the Soar area in consultation with various groups. We need to confirm that we have identified all the issues and options to resolve them. Some of the issues are not clear cut - there will always be some groups who may be adversely impacted by some of the proposals. We need to ensure that we achieve a balance between the conflicting demands placed upon our natural environment.

We therefore seek your views and/or support to achieve consensus on the issues and proposed action. Many of the issues raised in this report can only be resolved through the actions of others. We therefore need to work in partnership with pressure groups, those we regulate and other organisations to agree and implement proposed actions and improve the environment of the Soar area.



Peter Quarmby

Area Manager - Lower Trent

Midlands Region



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ENVIRONMENT AGENCY



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VISION FOR THE SOAR AREA

Man's activities generate waste and this needs to be disposed of whether to land, air or water. Intensive agriculture and industry have put pressures on our water resources. In addition, land use changes and development has resulted in a loss of wildlife and habitat. These growing demands and pressures mean that different areas have different needs, that opinions contrast and uses conflict.

- * The Agency's challenge is to balance these demands and conflicts;
- * To protect our natural resources and yet realise and develop the economic potential of the local area.

The Environment Agency's aspirations are:

For a diverse and valued local environment, which is managed and developed within the capacity of its natural resources, for all to enjoy.

The Agency seeks to achieve this vision through its statutory powers, duties and responsibilities and through a partnership approach to integrated environmental management. This will include working with as well as regulating industry, waste operators, farmers and developers to ensure full protection is given to the environment. Everyone has a role in making this happen.

The key objectives are therefore to:

- * Reduce the impact of polluting industrial processes on the environment.
- * Promote waste minimisation and the effective regulation of waste.
- * Assist Local Authorities improving air quality.
- * Manage water resources and ensure that we balance the needs of the environment with those of abstractors.
- * Achieve continuing improvements in water quality.
- * Ensure that people and property have effective protection against flooding and adequate flood warning.
- * Promote and further the conservation interests of the water environment, including the protection of biodiversity.
- * Ensure natural, healthy, mixed fish populations are present in all watercourses.
- * Promote recreational use of river corridors without compromising other uses.

This shared vision can only be achieved through the commitment of everyone.

SOAR

LOCAL ENVIRONMENT AGENCY PLAN

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PART I

THE MANAGEMENT PLAN

Introduction

*Part I. This first part of the Consultation Report is essentially the **proposed management plan** for the area. It introduces the reader to the Agency and the LEAP process, to explore the resources of the area, and to raise **awareness** of the **environmental issues** associated with it. **Human activities exert pressures** on all aspects of the environment and in turn this can **impact on the welfare of households, individuals and wildlife**. Planning the environment as a whole, through **partnerships and integration**, is the **key to it's success**. This plan provides the opportunity for **public involvement** so we can all **have a say** in what happens to our local environment.*

Part I : THE MANAGEMENT PLAN

- * Section 1 Introduction
- * Section 2 The local environment
- * Section 3 Issues and options
- * Section 4 Protection through partnership

*Part II provides **supporting information** into the **uses, activities and pressures** on the area, together with information about the **current state of the area** compared to **national and local targets**.*

Section 1 Introduction

This section gives an introduction to the Environment Agency and describes the Local Environment Agency Planning process and the purpose of this consultation report. A short introduction to sustainable development and biodiversity is also given.

- 1.0 Introduction**
- 1.1 The Environment Agency**
- 1.2 Local Environment Agency Plans (LEAPs)**
- 1.3 Sustainable development**
- 1.4 Biodiversity**
- 1.5 Waste prevention**

1.0 Introduction

This is the first Local Environment Agency Plan (LEAP) for the Soar area. The quality of our local environment and the way it is managed matters to all who live in and visit the area. To manage the environment as a whole and to achieve environmental improvements we need to have a common vision, an understanding of environmental pressures and issues and to work together. The Agency is committed to the delivery of environmental improvement at the local level and through this plan we will work in collaboration and partnership with various organisations and individuals to achieve agreed aims and objectives.

1.1 The Environment Agency

The Environment Agency was formed on 1 April 1996. It is an independent public body, established by the Environment Act 1995. We have taken over the functions of previous, separate environmental regulators; the National Rivers Authority (NRA), who had responsibility for the water environment; Her Majesty's Inspectorate of Pollution (HMIP), who had responsibility for the largest and most complex industrial processes, and the Waste Regulation Authorities (WRA) of the Local Authorities, who had responsibility for waste regulation. This merger provides a more integrated approach to the protection and management of the environment.

The Agency's vision is for a "better environment in England and Wales for present and future generations." Appendix 1 describes the Agency's aims and objectives in achieving this vision.

The Agency's aim is to protect and enhance the environment, thus contributing to the government's overall commitment to sustainable development. We will do this by integrating environmental protection for land, air and water. Pollution prevention and control, education and enforcement where necessary, will be key means in meeting this aim.

Throughout England and Wales we are divided into eight regions, which are subdivided into twenty six areas. The Midlands Region is divided into four areas, each headed by a locally based manager. Most of the Agency's work operates at a local level and this allows an integrated and personal approach to managing the environment. Scotland is covered by its own Scottish Environment Protection Agency (SEPA). Figure 1 below shows the Agency's regional boundaries.

Figure 1 The Agency's Boundaries



The Agency's main roles are Pollution Prevention and Control, Water Resource Management, Flood Defence, Fisheries, Conservation, Recreation and Navigation. The protection and management of the environment by the Agency is based on powers and duties provided by a number of different Acts which are brought together under the Environment Act 1995.

We protect the environment by issuing consents and licences for activities which have an environmental impact, for example water abstraction, disposing of or transporting waste material and waste water treatment and disposal. We also regulate the releases into the environment from some of the larger and potentially most polluting industries. This system of integrated pollution control (IPC) regulates releases to air, to controlled waters, to sewers and wastes that may be sent for disposal.

The Agency does not cover all aspects of environmental legislation and services to the general public. Local Authorities and other statutory and non statutory bodies who have joint responsibility within the plan area. These bodies and organisations are further discussed in Section 4 Protection through Partnership.

1.2 Local Environment Agency Plans (LEAPs)

For the Agency to fulfil its role and responsibilities, it needs to manage the environment effectively and to work in partnership with others. Local environment planning is an important tool in this process. The LEAPs are integrated action plans based on local river catchments and will help contribute to the principle of sustainable development through integrated environmental management and improvement. They will also play a key role in:

- * Promoting openness and accountability.
- * Developing liaison and partnership with key groups.
- * Educating the public on local environmental issues.
- * Prioritising issues and establishing an action plan for managing and improving the local area over the next 5 years.

The Consultation Report

This document, the Consultation Report is the first output from the LEAP process, and is not the final plan. To assist in the preparation of this report an informal (Issues) consultation exercise, with a range of organisations and groups took place in May 1996. The results of this exercise are summarised in Appendix 7.

The Consultation Process

The purpose of this three month consultation process is to enable the Agency to ensure that all interested parties have an opportunity to comment on and contribute to the development of a shared vision and agreed Action Plan for the Soar area.

We are interested in your views

Comments are required by 31 July 1997

A statement of all responses received during the consultation period will be published.

Action Plan

The vision and its supporting strategies for the next five years will be presented in the Action Plan, with a series of planned activities for the Agency and others to implement. The timetable for producing the Action Plan is February 1998.

Figure 2 The LEAP Process



(Note:- This five year implementation period may change)

The Review process

Regular monitoring and updating of the plan will be an integral part of the process. To this end Annual progress reports will be published and the full consultation process will be repeated every five years.

Relationship of LEAPs with other plans

The Agency shares the regulation and management of the environment with others. Whilst LEAPs are the Environment Agency's plans, their content and development will reflect these shared responsibilities. LEAPs will complement and integrate with other organisations plans such as Waste Local Plans, Local Air Quality Management Plans, Development Plans and Local Agenda 21 Plans. The Agency will contribute to their development and integrated management of the environment, through the publication of LEAPs and involvement as a consultee in liaison with these organisations.

In addition, the Agency can encourage and promote the means by which to achieve the targets set out in the National Waste Strategy, but it has no powers to require businesses or the general public to reduce wastes or use more sustainable methods of waste management. However, by identifying and publicising these issues locally, it may bring the necessary pressure to bring those involved to work towards their achievement.

Involvement of the Agency Statutory Committees and Area Environment groups

In order to ensure openness, objectivity and accountability, the Agency has to consult on all aspects of its work, including LEAP issues and Action Plans. Membership of the committees consists of local people drawn from public life, including industry, agriculture, local authorities and environment groups.

The Midlands Region is served by three statutory committees:-

- * Regional Environment Protection Advisory Committee (REPAC)
- * Regional Flood Defence Committee (RFDC)
- * Regional Fisheries Advisory Committee (RFAC)

The Lower Trent Area of the Midlands region, is served by its own advisory, non statutory, Area Environment Group (AEG). Membership consists of local people who live and work in the area and who represent a range of interests, such as Local Authorities, industry, agriculture, conservation, fishing, amenity and recreational interests. The AEG will advise the Agency on LEAPs, the importance of other local environment issues, and on the delivery of local services. It will act as a link between the local community, the Agency and its statutory committees.

1.3 Sustainable development

The Environment Agency is committed to the principles of sustainable development and embraces the definition set down in the 1987 Report of the World Commission on Environment and Development, The Brundtland Report:

"...development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This requires a full consideration of environmental, social and economic issues during the decision making process. Where the full effects of a particular proposals or policy are not known, then the 'precautionary principle' should be adopted whereby no action is undertaken until such a time as the potential impacts can be more clearly defined. The UK Government is firmly behind the principles of sustainable development and has published "Sustainable Development - The UK Strategy". It goes further in Planning Policy Guidance Note 12 "Development Plans and Regional Planning Guidance" (Department of the Environment (DOE), 1992) which states that:

"...the Government made clear its intentions to work toward ensuring that development and growth are sustainable."

The application of sustainable development to all the Agency's activities, policies and ability to influence will take some time to develop and evolve.

1.4 Biodiversity

The term 'biodiversity' was coined by the zoologist E. O. Wilson, from the words 'biological diversity'. It is commonly used to describe the number, variability and variety of living organisms; basically it means the variety of life. The loss of biodiversity may be at different levels but at its most fundamental and irreversible it involves the extinction of species. It may also have fundamental effects on our ability to achieve sustainable development.

The UK government signed up to the Biological Diversity Convention at the Rio Earth Summit in June 1992. This convention seeks to ensure that the full range of animal and plant species are conserved. A National Action Plan for biodiversity was published by the government in January 1994. A Biodiversity Steering Group gave detailed and costed action plans for 116 key species and 14 key habitats, many of them aquatic or wetland related and thus of particular interest to the Agency.

In pursuance of the Government's commitment to biodiversity conservation, the Agency has significant responsibilities regarding implementation of the UK Biodiversity Action Plan and will be developing targets for species and habitats of conservation concern. These will relate to the targets for key wetland species and habitats as identified by the UK Biodiversity Action Plan, emphasising the contribution that the Midlands Region can make to national targets.

Nationally, we will be a 'contact point' or coordinating body under the Action Plan for certain species and for chalk river habitats. Chalk rivers are not found in this Region. The Agency has produced a Biodiversity Strategy for the Midlands Region, which concentrates on those aquatic and wetland species and habitats identified in the Steering Group Report which are known to be present in this Region. The strategy looks at the contribution that the Midlands Region could and will be making to the national biodiversity targets. Relevant species in the region to which the Agency will pay particular attention are:

Water Vole*
Otter
Bittern
White-clawed crayfish*
Ribbon-leaved water-plantain
Freshwater pearl mussel
Depressed river mussel (*Present in area)

Additionally, there are other water related species and habitats in the region which will require protection. These include:

Great crested newt*
Natterjack toad
Floating water-plantain (*Present in area)

All Agency operational and regulatory activities will take account of these species and habitats in fulfilment of our commitment to biodiversity. Additional work will be dependent on available resources and will involve collaborative projects with other bodies (see section 4 for further detail.)

Section 2 The local environment

This section provides a general overview of the locality and describes its natural features and resources under the following headings:

- 2.0 Introduction - the Soar area**
- 2.1 Environment overview**
- 2.2 Land**
- 2.3 Water**
- 2.4 Air**
- 2.5 Wildlife and Heritage**

2.0 Introduction - the Soar area

The Soar plan area lies mainly within the county of Leicestershire, with small parts of Nottinghamshire and Warwickshire, including the urban areas of Leicester, Loughborough and Melton Mowbray. The total population is estimated to be around 705,000 and the area covers 1380 square kilometres. This includes the scenic upland Charnwood Forest area, as well as the fairly flat, open, rolling Wolds of Leicestershire and Nottinghamshire. This largely rural, agricultural area covers the catchment of the River Soar and its tributaries, the Sence, Wreake and Rothley Brook. The topography is shown on Map 2.

2.1 Environment Overview

The Soar valley has historically been prone to flooding, but is an ancient waterway, once the focus of the transport system for local industry. Over the years, pressures of human development, including waterways and flood defences, have impacted on the natural and semi natural habitats, leading to environmental stress. But the river is still above average in terms of riparian vegetation and has been well exploited on the whole, by recreational interests.

2.2 Land

2.2.1 Geology

The Soar area is predominantly underlain by clay strata consisting of Triassic Mercia Mudstones and Jurassic Lower Lias Clays, as shown on Map 3.

The Triassic mudstones outcrop in the north west of the area around Loughborough and Coalville, and consists of a thick sequence of red clays and marls interbedded with subordinate sandstone horizons known as "skerries". This group has low permeabilities although the skerry bands may act as a conduit for groundwater flow.

The majority of the area is underlain by Jurassic Lower Lias Clays, which consist of interbedded clays, siltstones and occasional limestone horizons. Again, this group has low permeabilities, with only the fissured limestones horizons acting as pathways for groundwater migration.

In addition to these clay strata a number of other rock formations are present in very localised areas. North west and south west of Leicester there are a number of

intrusive igneous bodies, which have historically been used as a source of road stone. In the Charnwood Forest area, Precambrian sediments are present and in the extreme north east corner of the catchment the Jurassic Inferior Oolite Series of oolitic limestones are present.

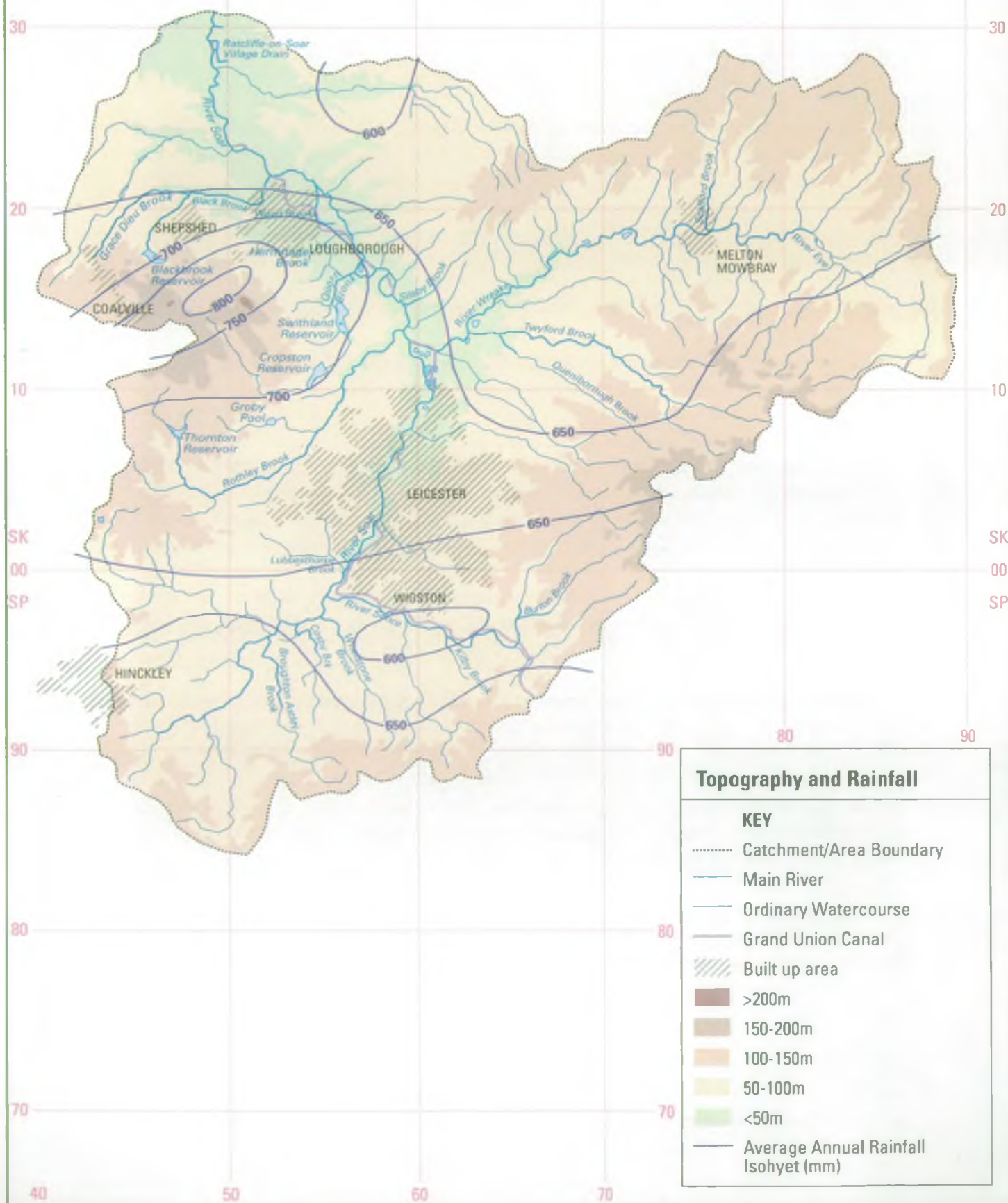
Finally, to the north west of Coalville there is a small area underlain by Triassic Sherwood Sandstones and Carboniferous Middle Coal Measures. The Sherwood Sandstones are a sequence of massive red sandstones with high permeabilities. Groundwaters from these sandstones which are found across the Midlands Region are used for public water supply.

The Carboniferous Coal Measures consist of interbedded mudstones, siltstones, sandstones, coal and seat-earths. The more permeable sandstone horizons may be isolated from each other by lower permeability silts and mudstones, and consequently

**Soar
Local Environment Agency
Plan
Map 2**



**ENVIRONMENT
AGENCY**





the aquifer will behave as a number of thinner isolated units.

2.2.2 Drift Geology and Soil Type

Superficial sand and gravel deposits and alluvial deposits are present throughout the area. They are principally deposited in the floodplains of the surface watercourses, although some sand and gravels are of glacial origin and are more widely distributed.

2.2.3 Landscape

The landscape of the Soar area can be defined in terms of the landscape, wildlife and natural features as used by English Nature and the Countryside Commission. These Natural Areas are shown on Map 4, along with the Agency Landscape Assessment for the Main river stretches in the area.

The lower Soar valley forms part of the Trent valley washlands. These washlands are still maintained by regular flooding. They form a flat, gently undulating area, with unimproved flood meadows.

Rising to the west of the Soar valley are the upland heathlands and woodlands of Charnwood, with shallow domed outcrops of mixed precambrian rocks. Stone walls and buildings contrast sharply with the gentle undulating open farmland of the surrounding clay areas. The rocks underlying this area are some of the oldest in England. Charnwood also contains more woodland cover than anywhere else in the area. To the west of Charnwood on the western edge of the area is the Leicestershire and Derbyshire coalfield, consisting of gentle ridges and shallow valleys, with little woodland or scrub cover, heavily influenced by agricultural and extractive industries.

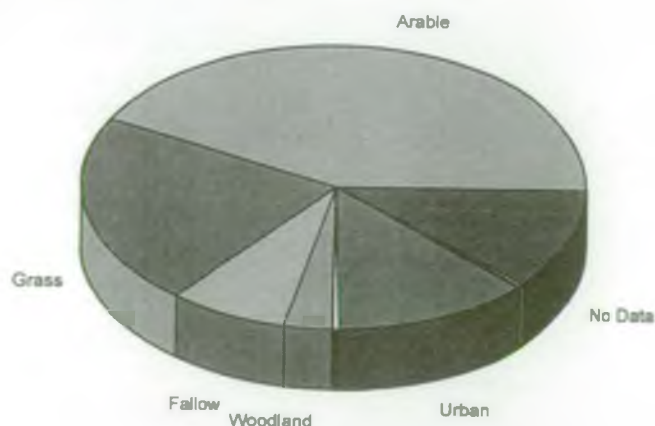
To the east of the Soar valley lie the rolling open exposed ridges and narrow valleys of the Leicestershire and Nottinghamshire Wolds. This area has a generally open landscape and is mostly arable, with sparse tree cover.

In the south of the area, lie the Leicestershire vales, comprising the urban area of Leicester and the urban fringe to the south of the city.

2.2.4 Land Use

The Soar plan area is principally agricultural land with the exception of the Leicester and Loughborough conurbations. Figure 3 shows the land use within the area.

Figure 3 Land use



These land uses are found throughout the area, as seen on Map 16, which shows the LANDSAT image (1990). Table 1 shows the landuse classification and percentage area of each landuse type in the plan area.

Table 1 Land Use Classification

Class	Legend	Area %	Cumulative % area	Area km ²
1	Arable	42.43	42.43	586.92
2	Grass	21.72	64.15	300.47
3	Fallow/bare	7.59	71.73	104.95
4	Woodland	3.08	74.81	42.57
5	Peat Bog	0.05	74.86	0.64
6	Moorland/Heather/ Bracken	0.04	74.90	0.53
7	Rough Grass/ Upland Pasture	0.40	75.30	5.60
8	Urban/ Industrialised	12.58	87.88	173.97
9	Water	0.12	87.99	1.64
10	Cloud/ Cloud shadow	0.38	88.37	5.23
11	No Data Available	11.63	100.00	160.86
Total of 11 classes		100.00		1383.38

Agriculture (arable and grassland) comprises over 60% of the plan area, and urban areas account for a further 12 %. For further details see section 5.12.

2.3 Water

2.3.1 Water Resources

Extensive development of water resources within the area has been restricted primarily by geology and topography. The geology (shown on map 3) is dominated by impermeable clays and marls with only very small areas of permeable rocks which form exploitable aquifers. The topography of the area (shown on map 2) has limited the development of public water supply reservoirs to the Charnwood Forest area.

The majority of the water used for public water supplies is therefore imported from outside the area. The primary source, operated by Severn Trent Water Ltd (which is one of two water companies in the area, the other being Anglian Water Services) is the River Dove in South Derbyshire. Within the plan area water supplies are provided from Cropston and Swithland Reservoirs and a recently commissioned scheme to transfer water from Thornton Reservoir to Cropston Reservoir via the Rothley Brook. Other supplies are also obtained by utilising the River Severn abstraction at Strensham, the Derwent Reservoirs in North Derbyshire and the River Derwent abstraction at Church Wilne. Severn Trent Water has recently secured additional



supplies through a new pipeline bringing in water from Rutland Water.

Groundwater resource development is restricted to two public water supply boreholes located in the western part of the area near Coalville. These boreholes abstract from the Sherwood Sandstones; however due to the fragmented and limited nature of the sandstone outcrop there is no potential for any large scale development. Elsewhere in the area some of the groundwater resources associated with the sand and gravel deposits in the Soar and Wreake valleys have been partially developed for agriculture and small industrial usage. In the past the Marlstone Rock, within the Lower Lias Clays, has been developed for small public water supplies in the Melton Mowbray area.

For satisfying water supply demands, other than those supplied by Severn Trent Water, water is abstracted from the Soar and the Wreake primarily for spray irrigation, mineral washing at the many quarries in the area and for industrial usage in the Leicester and Loughborough areas.

2.3.2 Groundwater and Hydrogeology

The majority of the plan area is underlain by low vulnerability Non Aquifers. The Mercia Mudstone, Lower Lias Clay, Precambrian sediments and Igneous bodies are all classed by the Agency as Non Aquifers. Non Aquifers therefore account for most of the area. They are generally of low permeability and where groundwater is present, it flows through the strata extremely slowly and is present in only limited quantities.

The small outcrops of Coal Measures, Triassic Sherwood Sandstone and Jurassic Inferior Oolite are classified as Minor, Major and Major Aquifer respectively, but their limited outcrop means that they are not considered to be strategic groundwater resources in a regional context. Nevertheless they are potentially useful and vulnerable aquifers, and need to be protected from polluting activities as detailed in the Agency's "Policy and Practice for the Protection of Groundwater".

The superficial deposits consisting of Sand and Gravel and alluvial deposits are all classed as Minor Aquifers. They are generally highly permeable and in hydraulic continuity with the surface water system, however their limited thickness and distribution means that while they may provide locally important water supplies, they are unable to support large public water supply abstractions. However, given the high water table generally present in such deposits, these aquifers are vulnerable to pollution.

2.3.3 Rainfall

The area receives relatively low average annual rainfall. The 1961-1990 average annual rainfall for the area is 642mm. Rainfall is influenced by topography, the wettest part being the Charnwood Forest area at 790mm and the driest being the Kingston Brook to East Leake area, which has only 590mm. Rainfall is shown on Map 2.

2.3.4. Water Quality

Surface Water - the upper reaches of the River Soar drain a mainly rural area and are of good to fair quality (General Quality Assessment or GQA B-C). The Soar itself and some tributaries receive treated sewage effluent discharges, with good quality dilution from tributaries. The first major tributary is the Thurlaston Brook, with a

GQA of C (fair). This drains a mainly rural area, but receives a significant proportion of treated sewage effluent. The next major tributary, the River Sence, has a quality of good to fair quality in the upper and middle reaches. This river is dominated by the impact of sewage discharges and below Wigston the quality is fair (GQA C). This is due to the influence of Wigston Sewage Treatment Plant (STP). This STP also contributes the first of three coloured discharges to the catchment (see Issue 2). The resulting discolouration is noticeable on the Sence and can at times affect the Soar into the City of Leicester.

Through the city the River Soar receives urban drainage both directly and from a number of tributaries. This brings with it associated problems of oil related pollution incidents from a variety of diffuse and point sources. Tracing these sources along the surface water sewer systems serving the city can often be difficult.

Below the city the single most important influence on the water quality of the River Soar is Wanlip STP serving the city and surrounding areas. Wanlip STP discharges into one of the several reaches which are bypassed by the Grand Union Canal navigation. Good to fair quality (GQA B-D) is maintained to the confluence with the River Trent, with the major tributary of the River Wreake and many more minor tributaries joining the Soar.

The Wreake catchment is a mainly rural area, comprising a network of mainly good quality tributaries such as the Gaddesby Brook and Langham Brook systems. A major discharge of treated sewage effluent from Melton Mowbray STP causes a reduction in quality from good (GQA B) to fair (GQA C) and a gap in the EC Designated Cyprinid fishery supported by the river (see Issue 9), before a recovery to good quality.

Table 2 - Summary of chemical and biological General Quality Assessment, 1995

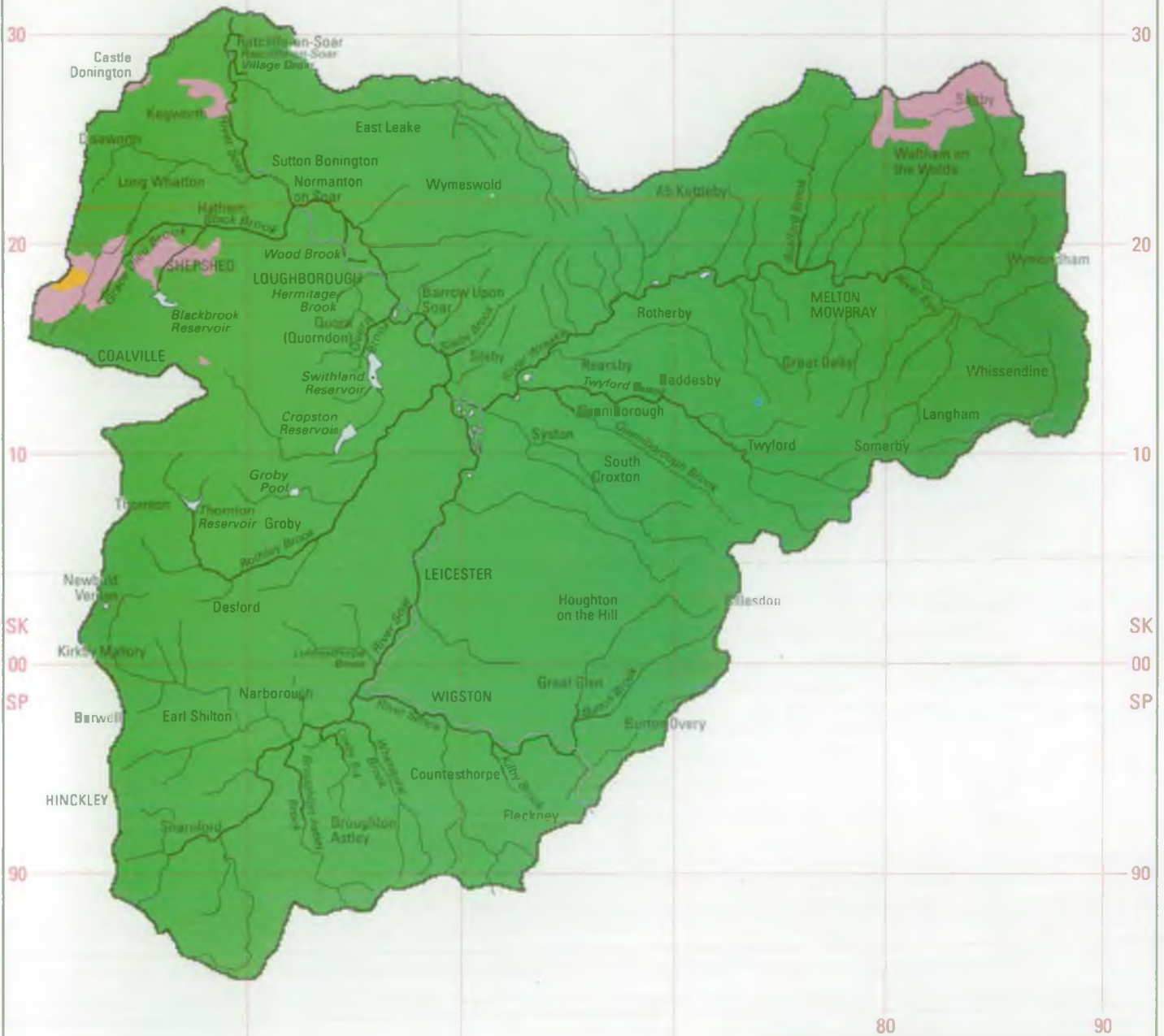
GQA Grade	Length of Watercourse in Grade (km)	
	Chemical	Biological
A	4.8	24.3
B	215.4	90.2
C	140.1	218.8
D	43.2	74.1
E	3.1	7.4
F	nil	nil
Unclassified		
Total	406.6	414.8

Downstream of the Wreake confluence the Soar receives Rothley Brook, the quality of which will improve following the recent diversion of two significant discharges of treated sewage effluent to Wanlip sewage works. Further downstream the brooks draining the Charnwood forest area are impounded to provide water supply reservoirs

**Soar
Local Environment Agency
Plan
Map 5**



**ENVIRONMENT
AGENCY**



Groundwater Vulnerability

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Major Aquifer
- Minor Aquifer
- Non Aquifer

and are of good quality, although the Wood Brook passes through Loughborough and receives the discharge from Loughborough STP which reduces the quality to fair just before entering the Soar. Black Brook takes significant treated sewage effluent discharges from Coalville and Shepshed, draining Shepshed and associated industrial premises resulting in fair quality. Kingston Brook and Long Whetton Brooks are of fair (GQA D) and poor (GQA E) quality respectively with the latter receiving drainage from a rural farming catchment, a significant treated sewage effluent, and drainage from East Midlands Airport.

Groundwater - the Agency undertakes routine monitoring of groundwater quality from a network of boreholes across the Region (for details see Appendix 2). The boreholes are principally located on areas of Major Aquifers, and to a lesser extent Minor Aquifers, as shown on Map 5. As a consequence of the low vulnerability of groundwater within this area, there is only a single Agency groundwater chemistry network site monitored. This monitors the quality of groundwater within the Triassic Sherwood Sandstone Aquifer at the north west extremity of the area. It is presently typical of sandstone groundwater, being of good quality and rich in calcium bicarbonate.

2.3.5 Flood defence

The Soar's major tributaries can all produce floods on the lower Soar. As a result of the construction of weirs and locks on the River Soar in the 18th century to maintain the water levels for navigation there is very little freeboard (the difference between general ground levels and the water level in the river) in the watercourse. This conflicts with the needs of agriculture for good drainage and hinders the passage of flood water.

Flooding history - the Soar Valley has suffered from frequent and extensive flooding since the late 18th century, notable floods occurring in 1900, 1910, 1932, 1947, 1961, 1968, 1975 and 1977. Advances in technology over the last two decades have made it possible to produce a mathematical model of the complex system of the River Soar between Leicester and the confluence with the River Trent in order to simulate flows and proposed flood protection measures. Using this model the Soar Valley Improvement Scheme was designed to alleviate flooding of villages and townships, roads and agricultural land within the Soar valley. The construction works were completed in October 1995 and included regrading and marginal widening of the River Soar, forming new flood defences for villages at risk, and construction of flow control structures and replacement navigation locks.

There are still a number of known flooding problems on main rivers and ordinary watercourses within the Soar plan area, and these are detailed in the section on Uses, Activities and Pressures (see section 5.9).

The Agency uses its legislative powers to control obstructions to flows in all watercourses and on Main river floodplains. It also endeavours to control development in the floodplain and those developments likely to cause flooding problems because of increased surface water runoff, by consultation and negotiation with Local Planning Authorities (LPAs). The current Agency policy is to restrict the rate of surface water runoff from new developments where there is insufficient capacity in the watercourse to accommodate the increased discharge.

Flood Warning - the Agency operates a flood warning system across much of England and Wales. Since September 1996 the Agency has taken the lead role in passing flood warnings to people at risk so they can take action to protect themselves and their properties. The latest technology is used to monitor rainfall and river levels are monitored 24 hours a day throughout the year. The Agency provides a flood forecasting system to certain areas of main river where there is a risk to people and property and where there is sufficient time for the warnings to be effective. Flood warnings are issued to the police, local authorities, media and the public through a variety of media, including AA Roadwatch, Teletext and regional radio and television. The Agency also provides a Floodcall "Dial and listen" service providing 24 hour recorded information on the latest flooding situation. A flood warning system is currently in place for the following reaches within the area:

S02	River Sence	Great Glen to Blaby
S03	River Soar	Littlethorpe to Wanlip
S04	River Wreake/Eye	Stapleford to Asfordby
S05	River Wreake	Frisby to Syston
S06	Rothley Brook	Glenfield to Rothley
S07	River Soar	Cossington to Cotes (including Cotes)
S08	River Soar	Cotes to Kegworth (including Kegworth)
S09	River Soar	Kegworth to River Trent

It should be noted that the Agency uses the best information available to predict the possibility of flooding, but no warning system can cover every eventuality. It is the responsibility of those who live in flood prone areas to be aware of any risk and to know what action should be taken to protect themselves if flooding occurs.

2.4 Air

The Agency contributes to the control of air quality through regulations of emissions to air from processes authorised under Part A of the Environmental Protection Act 1990.

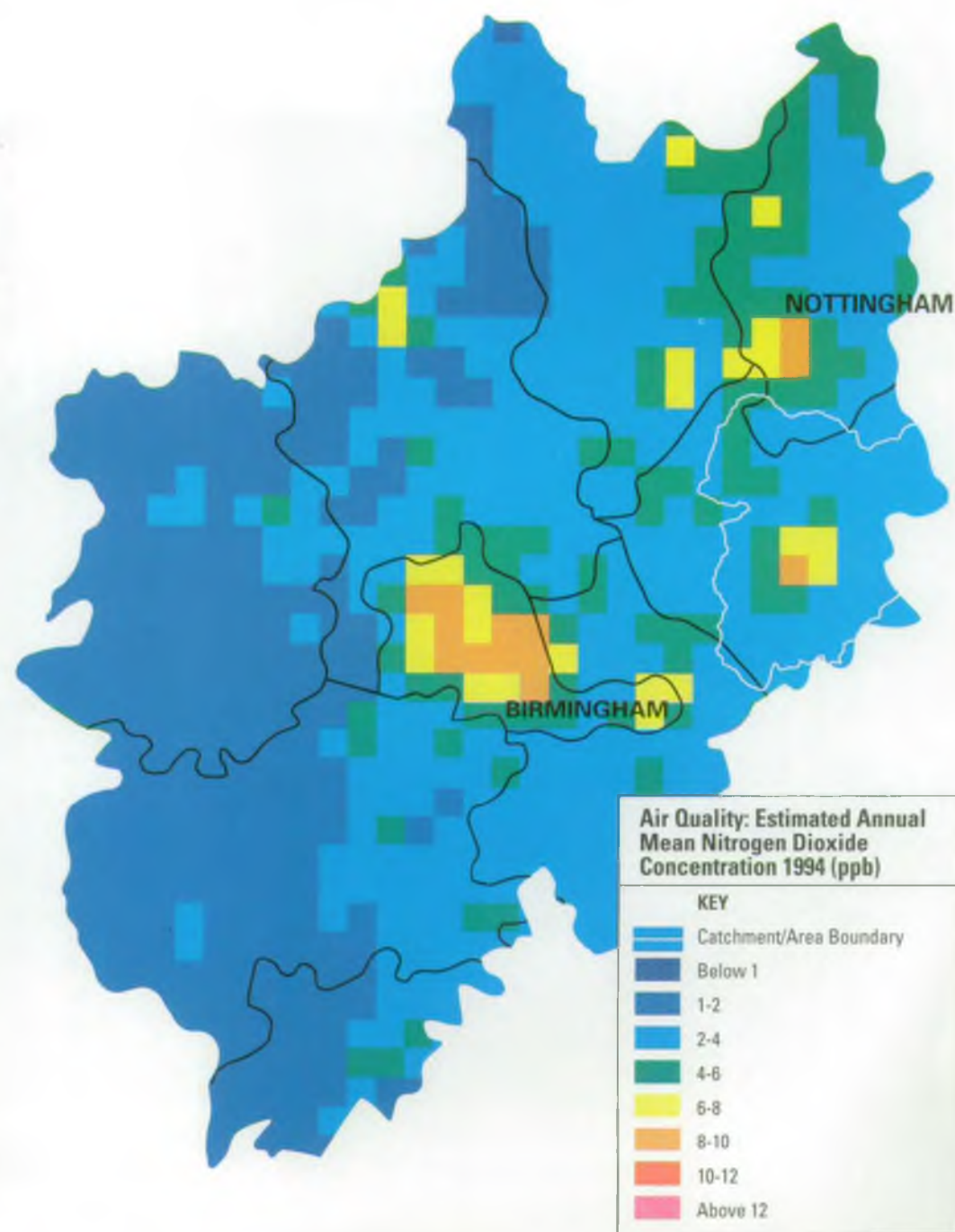
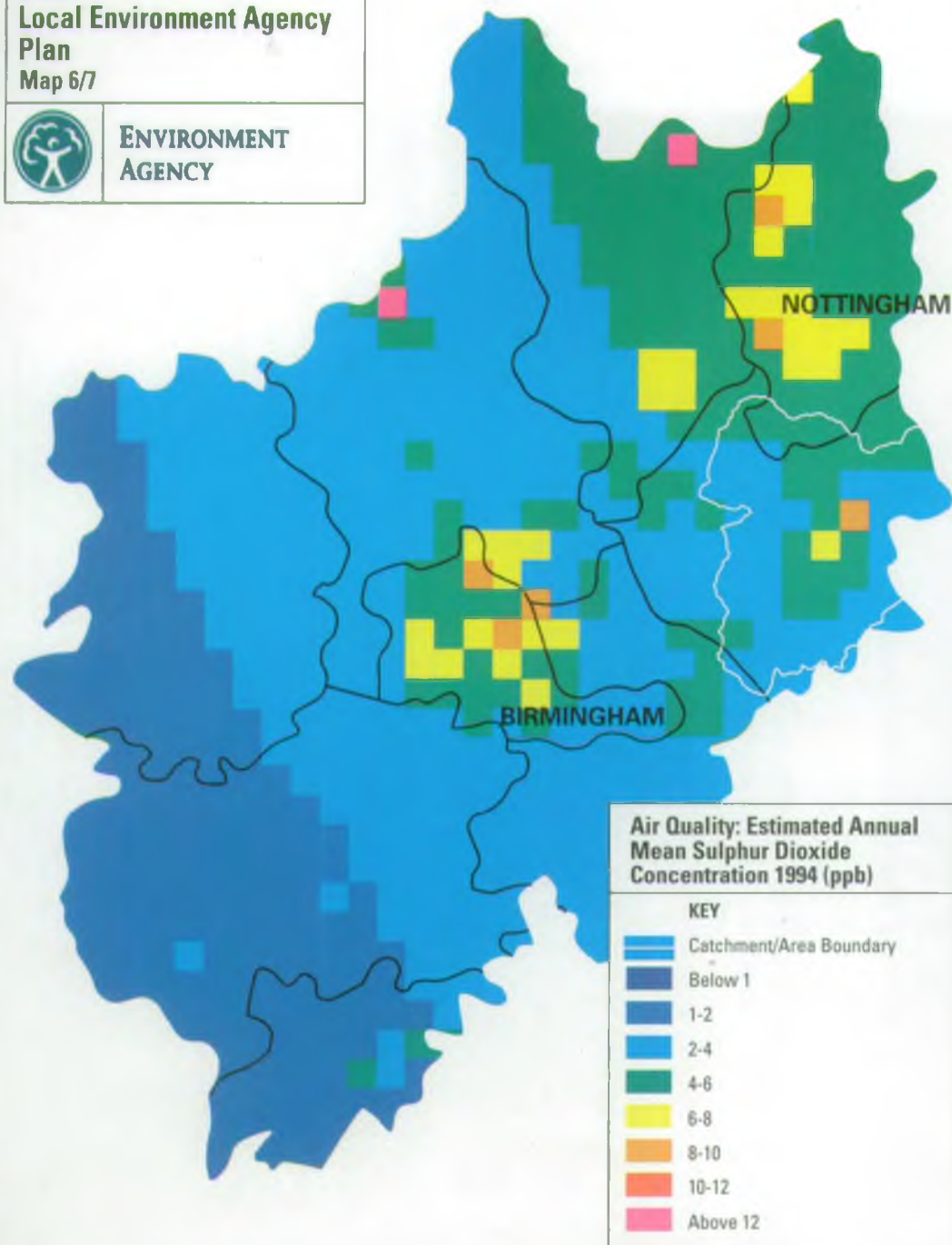
Air pollution may be in the form of gas or particulate matter and its impact may be local or global. Its dispersion and dilution depends on climatic conditions, especially with regard to particulate matter, which will often settle on nearby land or water, or inhaled. Examples of this are the affect on the ozone layer or the concentration of 'greenhouse gases' such as carbon dioxide, sulphur dioxide and nitrogen dioxide which may contribute to accelerated global warming.

Maps 6 and 7 show both sulphur dioxide and nitrogen dioxide levels across the region. The air quality for this area is generally good for those pollutants. However the urban areas of Leicester and Loughborough to a lesser extent do suffer episodes of poor air quality. The main pollutants giving rise to poor air quality are ozone and particulate matter (PM₁₀). The air quality is predominantly governed by emissions from motor vehicles in these areas and the area is crossed by several major roads.

Other indications show that episodes of high ozone concentrations at ground level can also occur in rural areas. These are caused by complex interactions between Volatile Organic Compounds (VOCs) and nitrogen dioxide in the presence of ultraviolet light. Since these pollutants typically arise many miles from the sites of the ozone episodes, action on a national level is necessary to reduce their occurrence.



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Large combustion plants such as Ratcliffe on Soar power station are regulated by the Agency under Part A of the Environmental Protection Act 1990. The Secretary of State for the Environment has put in place annual limits for the emissions to air of sulphur dioxide and oxides of nitrogen from these plants. This is in order to achieve reductions in emissions in pursuance of EC Directive 88/609/EEC, known as the Large Combustion Plant Directive.

2.5 Wildlife and Heritage

2.5.1 Conservation

The underlying geology of the Soar plan area, its topography and changing land use defines the habitats we see today. Urban development and changes in agricultural land use have had major changes in the landscape of the Soar area. The old, rich pasture land has virtually all been lost to intensive agriculture while wetland habitat along the river corridor has been reduced by drainage and flood alleviation schemes.

Woodland - the Soar plan area predominantly falls within Leicestershire, a county which has suffered a significant loss of woodland habitat throughout its history. Woodland within the area consists of broad-leaved, mixed scrub and plantation woods.

Broad-leaved woodland accounts for an estimated 4519 ha in Leicestershire (1.8% of the county), less than a third of this occurring in Sites of Special Scientific Interest (SSSI's). The total mixed and conifer plantation woodlands within the county are estimated at 4800 ha (2% of the county). However, only 13.9% of this woodland type is protected within SSSI's.

Hedgerows are still well represented within the plan area, but they are declining at a rate thought to be approaching 30% since the last war (Leics. County Council Planning and Transportation Department). Hedgerow protection regulations are proposed but are only likely to be applied to 20-30% of the most important hedgerows in the county.

Heathland - covers 34.5 ha of Leicestershire (lowland heathland identified to date in English Nature heathland inventory 1995) within only nine sites. Two thirds of heathland is dry heath, almost all of this from one site at Charnwood Lodge (21 ha). This scarce and fragmented habitat is recognised as a valuable national (Biodiversity Challenge 1995), regional and local resource, with 91% of all heathland in Leicestershire protected within SSSI's.

Grassland - the Soar plan area includes areas of acidic, neutral and calcareous grassland. It is estimated that 153 ha of acidic grassland occurs in Leicestershire, much of it associated with Charnwood. Similarly neutral grassland is concentrated around the Charnwood Forest area (English Nature grassland inventory, 1995). 13942 ha of neutral grassland has been estimated in Leicestershire, with unimproved neutral grassland being noted as being of regional importance for species diversity. Quality unimproved calcareous grassland covers some 28.2 ha in Leicestershire, nearly all within SSSI's. This habitat type is restricted largely to limestone and chalk quarries and roadside verges.

Wetlands - there are a number of wetland areas associated with standing water, canals and flowing water in the plan area. Standing water sites include man-made reservoirs such as Eye brook, Stanford and Swithland all of which are of significant regional and

local ecological importance and all falling within SSSI's. Little information currently exists on the quantity, value and distribution of field ponds within the plan area. The River Eye is noted for its ecological value on a national scale (Nature Conservation Review) and currently represents one of the catchments few remaining watercourses that has retained much of its original character. The Soar river corridor includes important wetland SSSI's such as Croft Pasture, Narborough Bog, Loughborough Meadow and Lockington Marshes.

Species - the European Habitats Directive identifies a broad range of species in various Annexes. Annex II (species for which Special Areas of Conservation should be designated) includes bats, otter, great crested newt, brook lamprey and Atlantic stream crayfish. Annex IV (species requiring strict protection) includes bats, otter, water vole and great crested newt.

On a national scale many species are given protection under the Wildlife and Countryside Act, 1981, including birds such as peregrine, black necked grebe, little ringed plover and barn owl, and other animals such as badgers, all species of bat, water vole, great crested newt and crayfish. All of those species cited above are thought to occur in the Soar area.

The information presented above has been extracted from the Leicestershire and Rutland Biodiversity Action Plan Audit, 1996, produced by the Leicestershire and Rutland Trust for Nature Conservation. The Audit provides a complete picture of the counties threatened habitats and species and will be referred to when formulating future Agency projects and policies.

Natural Areas - English Nature have divided England up into a series of Natural Areas, the borders of each area being defined by their wildlife, natural features, land use and human history. The long-term aim of this exercise is to maintain, enhance and restore wildlife and geology to each area. The plan area comprises the Trent Valley and Rises and Charnwood Forest Natural Areas as shown on Map 4.

Charnwood Forest has been designated as a Natural Area on the basis of its geology and regionally important habitats which support a vast range of characteristic and rare species of plant and animal. The supporting Natural Area Profile provides a comprehensive assessment of the Charnwood Forest area and will be referred to when formulating future Agency projects and policy.

Countryside Character Areas - English Nature and the Countryside Commission, with the help of English Heritage, have produced a map of England which depicts natural and cultural dimensions of the landscape. The Countryside Commission is also developing a series of Countryside Character descriptions which will identify past and recent changes to the landscape, and the main forces for such change. They will also include suggestions for broad management opportunities to help conserve, enhance, restore and even change the character of the countryside. The Agency will refer to these Countryside Character descriptions when formulating future projects and policy.

2.5.2 Heritage

The River Soar and its catchment is an area of high archaeological potential with evidence of human occupation in this part of middle England over the last 500,000 years.

The present course of the Soar follows the route of a major prehistoric river, the 'Midlands River', which flowed from the Midlands across East Anglia and into the North Sea basin circa. 500,000 years before present. This course is believed to have been the route followed by some of the early colonisers of Britain and their tools have been found in gravel quarries at Waverley Wood, Warwickshire.

Since the retreat of the last glaciers, some 12,000 years before present, human foragers and farmers have left cultural traces of their presence in the valley bottoms and on former floodplains which occur as fragmented higher terraces on the valley sides of the Soar and its tributaries. Within the floodplain, well preserved remains of Neolithic and Bronze Age date have been found buried beneath alluvium.

Environmental evidence, preserved in waterlogged organic deposits, particularly associated with relict river channels and wetland areas preserve traces of climatic and land-use history. Both cultural and environmental remains are sensitive to degradation, particularly through dewatering associated with fluctuations in groundwater levels.

The river has been a major resource for human groups for food, transport and power and has been the location of major settlements such as Leicester during the Iron Age, Roman, Medieval and post-Medieval periods. Although lacking large-scale wetlands, buried beneath the alluvium of the river and its tributaries are the tools, settlements, water mills and bridges which indicate human occupation in the area.

It is important that these potentially well preserved cultural and organic remains are protected or recorded during development within the Soar plan area. Through their understanding they are an important historical record, educational resource and social/recreational amenity.

2.5.3 Recreation and Navigation

A large number of people are regularly involved in a wide range of recreational activities within the plan area. Despite this there remains certain activities and areas which are under-utilised.

The popular River Soar/Grand Union Canal Navigation cuts through the middle of the plan area. At its northern end it joins the River Trent west of Nottingham running south through Leicester, down to London and beyond. The navigation was originally built to serve industry but is now of importance for pleasure boating, rowing and canoeing. British Waterways are the Navigation Authority and maintain the locks, moorings, banks and other features for the benefit of the boaters.

The development of the navigation network has also seen the development of an extensive network of footpaths and bridleways linking the Soar with the surrounding countryside. Some of this access is currently under-utilised, although the whole of the riverside area in Leicester has been designated as a Riverside Park encouraging use by the public.

Angling is another popular activity within the plan area. Coarse fishing takes place along the length of the Soar and many of its tributaries. Game fishing as well as coarse fishing also takes place at many of the stillwater fisheries located in the area.

The plan area also includes a wide range of sites of conservation interest which

provide areas popular for walking, bird watching, cycling and horse riding amongst other activities. Some of the larger stillwaters also accommodate sailing, windsurfing, jet skiing and sub aqua. Sustrans are currently expanding the cycle network within the area including a section of the National Cycle Network that follows the Soar corridor.

Section 3 Issues and options

Introduction

This section of the plan details specific environmental issues in the catchment and pick up on some of the concerns raised in Section 2, The Local Environment.

The issues have been identified by:

- * Using the local knowledge of Agency staff
- * Informal consultation with a range of organisations and interested groups
- * Comparing the current state of the area (Section 6) with national and regional targets

Your views and comments on the issues and options are requested together with any new ideas and suggestions. The options presented are the initial views of the Lower Trent Area, Midlands Region of The Agency and do not constitute policy statements. They are intended to facilitate improvements to the local environment for the benefit of all users. Their implementation will require the cooperation and commitment of many organisations and individuals.

- 3.0 Introduction - the local issues**
- 3.1 Protection and improvement of our environment**
- 3.2 Losses affecting our environment**
- 3.3 Land use and development impacts on our environment**
- 3.4 Opportunities for sustainable development**

3.0 Introduction - the local issues

The issues identified are not in priority order but are presented in associated issue groups under five main categories. Some issues are site specific, whilst others can affect many parts of the area.

Protection and improvement of our environment

- 1: Biodiversity Protection.
- 2: The impact of coloured discharges on the plan area.
- 3: The River Soar is showing increased evidence of eutrophication downstream of Leicester.
- 4: Lack of local prescribed flows for assessing abstraction licence applications.
- 5: Lack of compensation flows from public water supply reservoirs.

Losses affecting our environment

- 6: The loss of wetland resources along the Soar Valley.
- 7: Damaged river habitats.
- 8: Small native brown trout populations in the watercourses of Charnwood Forest.
- 9: Water quality in the River Wreake between Melton and Rotherby cannot be sustained.
- 10: Some stretches of river are either marginal or fail their proposed River Quality Objectives (RQOs).

Land use and development impacts on our environment

- 11: Dewatering activities and subsequent restoration in association with mineral extraction.
- 12: Fragmented nature of balancing surface water runoff.
- 13: Flooding in the Soar and Wreake valleys.
- 14: Pesticides in public water supply reservoirs
- 15: Copper contamination of the Queniborough Brook.
- 16: Local air quality in Leicester City.
- 17: Litter on and around the River Soar.
- 18: Derelict land
- 19: Landspreading of controlled waste

Opportunities for sustainable development

- 20: Recreational access along the River Soar.
- 21: Lack of definition of floodplains.
- 22: Improvement of flood forecasting systems.
- 23: The growth of aquatic plants is preventing the spawning migration of fish on the River Eye at Hams Bridge.

3.1 Protection and improvement of our environment

Issues 1 to 5 address the needs of the natural environment; the habitat, flora and fauna, as well as the need to improve our environment within the catchment. Due to development pressures and land use changes many of our natural resources are being put at risk.

Issue 1: Biodiversity Protection

Since the signing of the Biodiversity Convention by the UK Government at the Earth Summit of 1992, biodiversity protection has had a high political profile. Since this time, a National Biodiversity Action Plan has been produced and many county Biodiversity Plans are being formulated, including one for Leicestershire. The Agency has a duty to address biodiversity concerns and will contribute to national and local initiatives. The Midlands Region has produced its own Biodiversity Strategy.

The following are the key sub issues in the plan area that the Agency is aware of:-

Invertebrates

Atlantic stream crayfish. The status and distribution of indigenous Atlantic Stream Crayfish (*Austropotamobius pallipes*), a globally threatened species, needs protecting. This species is threatened by introductions of non native crayfish, especially the American Signal Crayfish (*Pacifastacus leniusculus*) into the Gaddesby Brook and the Turkish Crayfish (*Astacus leptodactylus*) into the Soar Brook system. There is a need to assess the status and distribution of these introduced populations with a view to controlling or eradicating them.

Mammals

Water voles are declining nationally and are threatened. There has been recent survey work to assess water voles in Leicestershire and present riparian management needs to be reevaluated in the light of the findings.

Otters. There is a need to assess whether otters are re-establishing themselves in Leicestershire waterways.

Birds

Barn owls There is a need to assess the distribution of barn owls throughout the area, including the availability of appropriate nesting sites.

Habitats

Lowland wet MG4 grassland has declined dramatically in the Soar valley from 3200 Ha in 1940 to only 150 Ha today. There is a need to identify and protect this remaining grassland, which is of European importance, and to increase the area of this habitat through enhancement schemes, such as Countryside Stewardship.

Alien invasive plant species. There is a need to assess the status and distribution of invasive alien riverside plants (eg Japanese Knotweed) in the catchment with a view to control or eradication. Such species can have a significant adverse impact on riverine biodiversity.

Riverside management. There is a need to improve riverside management practices in some areas, such as in the upper Soar and River Eye corridors, where targeting of Countryside Stewardship could improve biodiversity.

ISSUE NO: 1	Biodiversity Protection		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
<u>Atlantic Stream crayfish</u> a) Comprehensive survey to assess distribution of native and non native crayfish in upper Soar and Gaddesby Brook.	Environment Agency	Gain understanding of species distribution. Provide benchmark for assessing any decline or improvement of the population.	Consultant costs
b) Determine and undertake control strategy at those sites where non native species are identified.	Environment Agency	Protection of the globally threatened native species	Resource availability Costs
<u>Water Voles</u>			
c) Survey all main watercourses.	Environment Agency	Gain understanding of extent of decline	Consultant costs
d) Evaluate riparian management in light of findings.	Environment Agency	Protection and promotion of threatened species	Flood defence standards Landowner consent and land management
<u>Otters</u>			
e) Survey all main rivers for otter presence.	Environment Agency	Information on state of catchment in relation to status of rare species	Survey costs
<u>Barn Owls</u>			
f) Initiate programme of reintroduction	Local Authorities	Reestablish populations which have declined through loss of habitat	Availability of habitat/ nesting sites
<u>Lowland wet MG4 grassland</u>			
g) Identify remaining habitat in catchment	Environment Agency English Nature	Protection of habitat of European importance	Survey costs
h) Promote increase in habitat extent with stewardship initiative	Environment Agency MAFF FWAG	Promotion of habitat of European importance	Landowner consent and land management
<u>Alien invasive plant species</u>			
i) Survey problem on watercourses	Environment Agency	Gain understanding of the extent of problem	Survey costs
j) Commence eradication programme as required	Environment Agency	Removal of threat to river biodiversity	Manpower Herbicide use adjacent to water Difficult to eradicate
<u>Riverside Management</u>			
k) Improve riverside management in upper Soar and River Eye areas	Environment Agency	Improvement of river biodiversity	Landowner consent and land management

Issue 2: The impact of coloured discharges on the plan area

The Rivers Soar and Sence and the Wood Brook are often discoloured, exhibiting a marked pink or purple colour. In the deeper canalised sections, the water appears inky black.

The source of the colour is a number of dyehouses, associated with the textile industry, which are located in Leicester, Wigston and Loughborough. These dyehouses produce large volumes of polluted and often highly coloured process waters, which are drained to the public foul sewerage system for treatment in admixture with domestic sewage at the STPs. Some of the dyestuffs used, particularly those specified by customers requiring their products to meet high standards of colour intensity and wash fastness, are not amenable to removal in the normal sewage treatment process, with the result that residual dyes can be discharged in the treated sewage effluent into the river system. Only at Wanlip STP have Severn Trent Water installed any further treatment process to assist with the removal of residual dyes from the effluent. The result is that they are discharged in the treated sewage effluent into the river system. Several of the dyehouses concerned have installed pilot or fullscale treatment plant, but with mixed success. One large dyehouse in Leicester however, has successfully commissioned a plant, the first of its kind anywhere in the world. This plant not only removes the colour, but enables over 50% of the effluent to be recycled back into the dyeing process, saving not only water resources, but also energy and chemical costs.

The discolouration of the river system leads to public complaint due to the visual impact. Apart from the serious reduction in amenity value of the affected stretches, there is evidence that plant growth may be restricted by the reduced light penetration. Although the colour does not appear to adversely affect the population and diversity of aquatic invertebrates, it is possible that the feeding habits and success of fish may be affected.

The discharges of treated sewage effluent are made with the consent of the Agency. Negotiations with STW Ltd prior to introducing control on the degree of coloration of the effluent have been ongoing for four years. The Agency, as did the NRA, participates in various tripartite discussions involving the Knitting Industry Federation, as well as STW Ltd. As a result of these negotiations, the discharge consents for all three of the STPs involved were modified to introduce colour standards from 1 January 1996. The standards are phased to progressively improve the situation over a three year period.

The Agency will need to monitor compliance with the colour standards and the rate of progress with treatment methods employed by both STW Ltd and the dyeing industry. Monitoring of the receiving watercourses will be necessary both to ensure that the required degree of improvement is realised, but also to check that no adverse impact arises as a consequence of the treatment methods employed. There is also a possibility that changes to the aquatic flora due to improved light penetration could have consequences for water quality in terms of increased diurnal fluctuations in dissolved oxygen levels, and for the fishery and flood defence uses of the rivers due to increased weed growth (see Issue 3).

ISSUE NO: 2	The impact of coloured discharges on the plan area		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Monitor and enforce the colour standards now applied to the STPs at Loughborough, Wanlip and Wigston. Monitor colour levels in relevant reaches of watercourses	The Agency	Identify degree of progress by dyehouses and STW Ltd in resolving colour issue	Cost Increased cost of monitoring
b) Install treatment plant at STPs to remove colour from discharge	Severn Trent Water Ltd	Improved water quality	Cost High revenue cost of treatment borne by dyehouses
c) Install treatment plant at dyehouses to remove colour	Individual dyehouses	Improved water quality. Recycling of effluent gives water resource and waste minimisation benefits and long term cost savings for dyehouse	High capital cost of plant. Limited number of commercially viable systems currently available
d) Improve dye chemistry and technology to reduce dye wastage in dyeing process	Chemical Industry	Waste minimisation. Reduced treatment costs Improved water quality	Technical difficulty. Low customer demand for improved dye products.
e) Reduce demand for vibrant, wash fast colours in textile products	The Public Fashion Industry	Waste minimisation Reduced treatment costs Improved water quality	Inertia to change

Issue 3. The River Soar is showing increased evidence of Eutrophication downstream of Leicester

Concentrations of dissolved oxygen in the lower reaches of the river show diurnal fluctuations in summer related to photosynthesis and respiration by aquatic plants.

The magnitude of these fluctuations has increased recently, suggesting increased plant growth, perhaps related to increased light penetration following water quality improvements. Levels of orthophosphate (an important plant nutrient) are high within the river, and botanical surveys have shown a vegetation typical of eutrophic conditions. Increased plant growth could have consequences for water quality, fishery and flood defence uses of the river. The Agency carries out periodic assessments of candidate waters for designation as Sensitive Areas (Eutrophic) (SA(E)) under the Urban Waste Water Treatment Directive (UWWTD), and parts

of the Soar plan area may be examined during the period 1998 - 2000 for the next review.

ISSUE NO: 3	The River Soar is showing increased evidence of eutrophication downstream of Leicester		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Maintain and increase monitoring effort on River Soar to determine eutrophic status. Data required on nitrate, phosphate, dissolved oxygen and macrophytes.	Environment Agency	Identify at an early stage whether early indications of a change in eutrophic status are substantiated. Collect suitable data for proposal of River Soar as designated sensitive water at the next review.	Cost
b) Review data in 2000 for possible inclusion as sensitive water under EC UWWT Directive	Environment Agency	Planned programming of priorities	Cost
c) Removal of nutrients to prevent eutrophication.	Severn Trent Water Ltd	Reduce eutrophication and impacts on fishery, flood defence uses of river	Cost Low nutrient levels required. High capital and revenue costs of extra treatment plant

Issue 4: Lack of local prescribed flows for assessing abstraction licence applications

A licence to abstract from a watercourse may be subject to a prescribed flow condition in order to maintain the flow and protect existing users. Abstraction is limited to periods when the flow is above a set rate. For the Soar area, this rate is set at Syston for the Wreake and at Littlethorpe for the upper Soar. Below the Wreake/Soar confluence abstraction is controlled by the flow in the Trent as measured at Colwick.

These prescribed flows however do not reflect local conditions, especially in some tributaries, such as the Gaddesby Brook and Queniborough Brook. There is a need to set and implement more realistic local prescribed flows.

ISSUE NO: 4	Lack of local prescribed flows for assessing abstraction licence applications.		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Investigate realistic local prescribed flows for tributaries	Environment Agency	Protection of river environment and existing uses.	None
b) Implement above	Environment Agency	More realistic licensing policies	

Issue 5: Lack of compensation flow from some public water supply reservoirs

There are five public water supply reservoirs in the area. In some cases, such as at Swithland, Cropston and Nanpantan, there is no compensation flow requirement associated with the current licences. Therefore there is a need to review whether such flows should be introduced in order to provide dilution to Sewage Treatment Plants (STPs), enhance the ecological interests of the river and to protect the rights of riparian owners immediately downstream of the reservoirs.

ISSUE NO: 5	Lack of compensation flow from some public water supply reservoirs		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Review all compensation flows associated with PWS reservoirs	Environment Agency Severn Trent Water Ltd	Know the extent of the problem	
b) Provision of appropriate compensation flows	Environment Agency Severn Trent Water Ltd	Ensure protection and improvement of the environment	

3.2 Losses affecting our environment

Issues 6 to 10 consider the decline in species and habitat that has occurred within the catchment.

Issue 6: The loss of wetland resources along the Soar Valley

Wetland habitats in the area have been lost at an alarming rate to drainage, flood defence, agriculture and through a lack of proper management. The remaining wetlands of the Soar valley are therefore of great value and require continued protection of the water regime, if they are going to be able to sustain their ecological interest. Wetlands possess a rich and diverse wildlife resource, with many of those species present being uniquely adapted to the waterlogged conditions. The following wetland SSSIs are along the River Soar: Lockington Marshes; Loughborough Meadows; Cotes Grassland; Barrow Gravel Pits; Narborough Bog and Croft Pasture.

This issue is addressed by the following sub issues:

- * The need for a **Soar Valley Wetlands Strategy** to provide a strategic overview of wetlands in the valley and their future management.
- * The need to produce **Water Level Management Plans (WLMPs)** for relevant SSSIs where the water regime has been a problem ie Lockington Marshes and Narborough Bog.
- * The need to investigate **enhancement schemes** to improve water regimes and thus protect and sustain wetland wildlife.
- * The need to create **new wetland habitats** where opportunities exist and to maximise the wildlife benefits to be gained from the wetland restoration of mineral workings.

ISSUE NO: 6	The loss of wetland resources along the River Soar		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Production of Soar Wetlands Strategy	Environment Agency English Nature Wildlife Trusts	Protection, management and enhancement of remaining wetlands	Manpower/ resources to implement strategy
b) Produce WLMPs for Narborough Bogs and Lockington Marshes	Environment Agency	Ensure water regime meets ecological requirements	Manpower/ resources to implement WLMPs
c) Enhance water levels in wetlands where required	Environment Agency Wildlife Trusts Landowners	Improved water regime for wetland Flood defence- enhance flood capacity	Landowner consent and land management Flood defence standards Landowner consent and land management
d) Promote and maximise the ecological value of new wetlands	Environment Agency/ Local Authorities LRTNC	Improved wildlife value of plan area Increased protection of valuable habitat	Town & Country Planning requirements Landowner consent and land management

Issue 7: Damaged river habitats

Previous land drainage and flood defence schemes have degraded riverine habitats, resulting in a loss of structural diversity. This loss of structural diversity results in an impoverished biological system and a reduced aesthetic appeal.

The Rivers Wreake and Sence have both been affected in the past by flood defence work that has been unsympathetic to the instream environment and therefore to fish, mammals, birds and other biota. Essentially, the channel in certain areas is too wide and shallow to retain fish. At the same time there is a need to protect the environment in the future from unnecessary degradation through the culverting of any watercourse.

ISSUE NO: 7	Damaged river habitats		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Investigate the possibility of rehabilitating the degraded concrete lined Black Brook through Loughborough	Environment Agency	Improvement of degraded habitat and increase in species diversity	Need to maintain current standard of protection against flooding
b) Investigate above scheme for restoration based on hydraulic capacity and detailed survey	Environment Agency	Improvement of degraded habitat and increase in species diversity	Need to maintain current standard of protection against flooding
c) Survey Rivers Wreake and Sence to assess areas for instream improvements	Environment Agency	Improvement of degraded habitat and increase in species diversity	Flood defence standards Landowners consent and site management
d) Design and build suitable low flow weirs, current deflectors, gravel shoals or fish holding shelters	Environment Agency	Benefits to the fish populations	Flood defence standards Landowners consent and site management
e) Development of a MoU with LPAs about the culverting and degradation of watercourses.	Environment Agency Local Planning Authorities	Avoidance of future deterioration of the natural environment and future conflicts of interest	Development and planning pressures

Issue 8: Small native brown trout populations in the watercourses of Charnwood Forest

Charnwood Forest and its streams contain the only native brown trout in the whole of Leicestershire. Their range is presently very limited and interactions between the adults are restricted by a number of factors.

A combination of factors, such as water impounding (water supply) Reservoirs and land

drainage work downstream of the surviving pockets of fish prevent migration and mixing of the populations. Consideration should be given to identifying the distribution and size of the populations and to improving access to suitable habitat.

These habitats will require protection through the Agency's regulatory powers and continued monitoring of the populations will be necessary.

ISSUE NO: 8	Small native brown trout populations in the watercourses of Charnwood Forest		
OPTIONS	Responsibility	Benefits	Constraints
a) Identify distribution and size of native populations	Environment Agency	Determine the size of the problem	Survey costs
b) Improve access to suitable habitat	Environment Agency	Enable populations to increase	Cost
c) Investigate whether PHABSIM study would be appropriate to determine how flows could be managed to improve habitats (see Issue 5)	Environment Agency	Provide information to develop flow management options to improve habitats	Cost Water quantity may not be the critical factor
d) Resist stocking of non native species	All	Prevent worsening of the problem	

Issue 9: Water quality in the River Wreake between Melton and Rotherby cannot be sustained

The River Eye/ Wreake system is a designated fishery under the EC Fisheries Directive (78/659/EEC). The designated reaches are from Stapleford to Melton Mowbray STP outfall and from Hoby to the confluence with the River Soar.

The missing stretch of 10 km from Melton Mowbray STP to Hoby prevents an otherwise continuous run of 32.5 km of designated fishery. Although the water quality currently meets the standard required by the directive, the stretch cannot be designated. This is because the quality cannot be sustained on the present consented load of ammonia to the river from the STP.

A modest tightening of the consented ammonia standards is required to the STW Ltd consent. This may require some capital expenditure by the water company. If so, the works would need to be identified as a priority works for expenditure during the next phase of the company's investment programme (Asset Management Plan or AMP),

running from 2000- 2005.

Water quality modelling of the affected stretch is necessary in order to determine the exact degree of tightening of the STW Ltd consent which will be needed. Discussions with STW Ltd, regarding the extent of capital works needed to ensure compliance would then be needed to enable the Agency to decide on the priority of the works within the next round of expenditure.

ISSUE NO: 9	Water quality in the River Wreake between Melton and Rotherby cannot be sustained		
OPTIONS	Responsibility	Benefits	Constraints
a) Water Quality modelling of River Wreake system to determine required consent standards to sustain EC Fisheries Directive quality	Environment Agency	To identify the extent of works required to sustain the water quality	Cost
b) Prioritise necessary improvements for submission for expenditure under water company's AMP3 programme	Environment Agency / Severn Trent Water Ltd	Programme of priorities planned	Limited funding available for AMP3 programme
c) Submit reach for designation as fishery under the EC Fisheries Directive	Environment Agency	Maintain water quality Increased length of designated fishery	

Issue 10: Some stretches of river are either marginal or fail their proposed River Quality Objectives (RQOs)

The RQOs set for each reach of the watercourses in the area need to be realistic and have been assigned bearing in mind the uses and needs for each section of the river. Some reaches fail to meet the RQO at present and some are at risk of future failure and consented loads of effluent are realised.

Fleckney Brook

The Fleckney Brook downstream of Fleckney STP outfall is of poor quality (General Quality Assessment or GQA E). The primary cause of the poor quality is the treated sewage effluent discharged from the STP and in spite of being improved during the first phase of STW Ltd's investment programme, needs a further tightening of the

consent conditions in order to secure long term improvements in the downstream water quality. This will require capital expenditure by prioritisation of the works for a future round of the investment programme.

Grace Dieu Brook

The Grace Dieu Brook deteriorates from fair to poor water quality (GQA C to E) due to the impact of Snarrows (Coalville) STP. In order to secure the necessary improvement in water quality, a tightening of consent conditions, which will require capital expenditure to ensure compliance, is needed.

River Sence

Achievement of fair water quality (GQA D) by the River Sence downstream of Wigston is marginal. Long term achievement, as consented loads are taken up at Wigston, Whetstone and Countesthorpe STPs, due to growth and development within the catchment, will require a tightening of consent conditions. Again, this will require capital investment at one or more of the STPs mentioned above.

ISSUE NO: 10	Some stretches of river are either marginal or fail their proposed River Quality Objectives (RQOs)		
OPTIONS	Responsibility	Benefits	Constraints
a) Set appropriate RQOs to meet the needs and uses of the River Soar and its tributaries	Environment Agency	Identification of appropriate quality of water resource for users.	Cost
b) Identify reaches where long term RQO is not sustainable and set medium term RQO.	Environment Agency	Maintain existing quality	Cost
c) Prioritise reaches with medium term RQO for submission for expenditure under water company AMP3 programme	Environment Agency	Planned compliance with long term RQO	Limited funding available for AMP3 programme

3.3 Land use and development impacts on our environment

Issues 11 to 19 look at the interaction between land use and development and its impact on the environment.

Issue 11: Dewatering activities and subsequent restoration in association with mineral extraction

The extraction of minerals below the water table invariably necessitates dewatering activities. The water is often pumped into an adjacent watercourse and therefore represents a loss of groundwater resources. Only when there is a low flow problem in the receiving watercourse does any benefit accrue. In those areas where the aquifer is already extensively exploited, every effort should be made to reintroduce some of the pumped groundwater back into the aquifer. Dewatering operations, if badly planned, can result in the dessication of adjacent wetland sites, which are dependant on a high water table. They can also adversely affect private water supplies from wells, boreholes and springs.

For those quarried areas where the water table is close to the surface, the increasing lack of inert waste available to restore the land to original ground level necessitates restoration to either a wetland or to low level agriculture. If it is the latter, at some sites, the aggregate companies wish to pump in perpetuity in order to depress the water table to an acceptable level to facilitate agricultural usage. This can result in an unacceptable loss of groundwater resources.

The use of Pulverised Fuel Ash (PFA) as infill in excavated quarries, having a high water table, if not properly planned, can cause localised impediment to groundwater flow, resulting in drainage problems.

The Environment Act 1995 introduced new requirements for an initial review and updating of old mineral permissions and the periodic review of all mineral permissions thereafter. This came into force on 1 November 1995 to ensure that conditions attached to mineral permissions do not become out of date with respect to effects on the environment.

There is currently a major risk to the Lockington Marshes SSSI due to the proposed extraction of sand and gravel to the southwest of the site. The main concerns are twofold. Firstly, it is feared that dewatering of the extraction site will lower the groundwater level to such an extent that the SSSI will dry up. Secondly, infill of the site during the restoration phase may interfere with groundwater movements, therefore impacting on the SSSI.

ISSUE NO: 11	Dewatering activities and subsequent restoration in association with mineral extraction		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Liaison over new minerals applications	Minerals Planning Authorities Environment Agency	Prevention of waste of water resources and inappropriate dewatering methods and maintain existing wetland ecology	Manpower
b) Review of old permissions	Minerals Planning Authorities	Betterment of some unsatisfactory situations	Manpower
c) Enforcement of Section 30 procedures	Environment Agency	Prevention of waste of water resources and inappropriate dewatering methods	Manpower
d) Protect Lockington Marshes SSSI from the future impact of sand and gravel extraction	Minerals Planning Authorities Environment Agency English Nature	Minimise impact on SSSI through adherence to planning conditions and provision of agreed mitigation programme	Legislation Effectiveness of mitigation programme

Issue 12: Fragmented nature of balancing surface water runoff

Restriction of the rate of discharge of surface water runoff from new development by balancing of individual sites has been utilised fairly extensively in the Soar sub catchments to prevent aggravation of known flooding problems. This fragmented approach to balancing may have led to over balancing in some areas. The effect of multiple balancing is to be investigated and a strategy developed.

The Lubbesthorpe Brook catchment is an example of a fully developed catchment where many areas have been individually balanced and possibly overbalanced. The overall effect of many small scale balancing schemes within a sub-catchment has not been investigated and may cause problems. It is therefore proposed to investigate the effect of multiple balancing in the Wood Brook and Rothley Brook sub-catchments and subsequently develop a balancing strategy.

ISSUE NO: 12	Fragmented nature of balancing surface water runoff		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Investigate effect of multiple balancing	Environment Agency	To determine whether there is a problem with overbalancing	Time available Resources
b) Develop and adopt a strategy for balancing in the Wood Brook and Rothley Brook catchments	Environment Agency Local Planning Authorities	To remove potential source of flooding problems	
c) Do nothing		No cost	May be creating new problems

Issue 13: Flooding in the Soar and Wreake valleys

Local road flooding is still perceived to be a problem by the general public in the valleys of the Rivers Soar and Wreake. Many roads across the valley are liable to flooding and are included in the Agency Flood Warning System. However the recent River Soar Flood Alleviation Scheme has significantly improved the problem. For example, the construction of the river control gate at Pillings Weir has resulted in protection of the B675 Quorn to Barrow on Soar road for most flood events, a flood free route across the valley has been provided by the new Leicester Western Bypass and many minor roads in the lower Soar area have received increased standards of flood protection. A large balancing area and river control gate at Frisby constructed in 1980's has provided increased flood protection to roads across the Wreake valley although these roads are still flooded fairly frequently. The remaining roads that are liable to flood are low lying and the cost of providing protection could not be justified.

The hydrodynamic model of the River Soar, completed in February 1996, has identified a number of properties at risk from flooding during flood events with a lower return period than the current standard of protection. It is proposed to investigate these cases and to identify whether it would be feasible to develop flood defence schemes to increase the standard of protection to the properties at risk.

ISSUE NO:13	Flooding in the Soar and Wreake valleys		
OPTIONS	Responsibility	Benefits	Constraints
a) Continue to provide flood warnings for roads that are still liable to flooding	Environment Agency	Maintenance of current standards of warning	
b) Continue to liaise with developers of large sites in the Soar valley who have proposed flood protection works to roads as part of their development plans	Environment Agency	Possible improvements to some road flooding problems	
c) Investigate improved protection to roads in the Wreake valley by alterations to the operation of Frisby gate and balancing area	Environment Agency	Possible improvements to some road flooding problems	Cost
d) Investigate feasibility of defending those properties at risk from flooding during flood events with a lower return period than the current standard of protection.	Environment Agency	Improved flood defence standards	Cost/ benefits

Issue 14: Pesticides in public water supply reservoirs

Whilst organic pollution from farms in the area has decreased in recent years through effective pollution control and farm waste management, examples of acute pollution by farm insecticides have been detected quite regularly by biological monitoring. In some cases, these incidents have caused severe biological damage along several miles of watercourse, with a severe impact on biodiversity and fish food supply. Such pollution arises through careless handling, mixing or disposal of pesticides, small quantities of which can be extremely toxic to aquatic invertebrates. There is a need for increased awareness in the farming community of the need for correct handling and disposal procedures.

Elevated levels of the herbicide isoproturon, used extensively on cereal crops in the UK, have been found in the waters of the Charnwood Forest reservoirs Cropston, Swithland and Blackbrook which are used by the Severn Trent Water Ltd as water supply sources. Although the levels detected are above the standard laid down by the EC Drinking Water

Directive (80/778/EEC), no failure of the directive has occurred due to the removal of the pesticide during the treatment process at the STPs. The EC Directive concerned with the quality of surface water abstracted for treatment as drinking water supply (75/440/EEC) controls only a limited range of pesticides not including isoproturon. Biological monitoring of the reservoir feeder streams has shown that the levels involved have not had any adverse impact on aquatic fauna, as expected given the relatively low ecotoxicity of isoproturon.

Extensive investigations within the catchments of these reservoirs have identified every user of the material and have failed to find any evidence of any point source contributions, due for example to spillages or poor operational procedures. Nor has any evidence emerged of misuse in terms of over application or application close to watercourses in contravention of the Code of Practice issued under the Food and Environment Protection Act 1985.

A recent review of the use of the material by the Advisory Committee on Pesticides has recommended a halving of the recommended application rates. Continued monitoring of the situation will be needed to ensure that the situation does not worsen significantly and to ensure that users remain aware of the acute need to avoid any misuse or abuse of this or any other pesticides within the reservoir catchments.

ISSUE NO: 14		Pesticides in public water supply reservoirs	
OPTIONS	Responsibility	Benefits	Constraints
a) Continued monitoring of pesticide levels in water supply reservoirs and feeder streams	Environment Agency Severn Trent Water Ltd	Early indication of any change in levels or pesticides detected or impact on aquatic fauna	Cost
b) Continuing pollution prevention visits and advice in relevant watercourse catchments	Environment Agency	Increased awareness by pesticide users in the area of statutory guidelines and sensitivity of area Improved water quality	Cost

Issue 15: Copper contamination in the Queniborough Brook

Levels of copper in the lower reaches of the Queniborough Brook exceed the environmental quality standards laid down by the UK in order to protect aquatic life. Copper is a list 2 substance under the EC Dangerous Substances Directive (76/464/EEC).

Two sources of the copper have been identified. One, a discharge occurring via the surface

water system from an electroplating company, has now been stopped. The second source is the treated sewage effluent from Queniborough STP which receives effluent from two electroplating companies for treatment in admixture with domestic sewage. The copper is incompletely removed during the treatment process. The discharge consent for the sewage works does not contain any standard to control the level of copper in the effluent.

Following initial discussions with the Water Company it has been necessary to introduce a two stage effluent standard for copper with tighter standards in the second phase, in order to ensure future compliance of the brook with the Environmental Quality Standard (EQS). This will require either a change in operational methods or the installation of treatment plant by the plating companies in order to reduce the amounts of copper being discharged to the STP. The Agency will endeavour to ensure that proposals by the water company to divert the whole sewage works to Wanlip do not prevent waste minimisation initiatives being pursued by the plating companies.

ISSUE NO: 15		Copper contamination in the Queniborough Brook	
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Monitor and enforce standards for copper now in force for discharge from Queniborough STP	Environment Agency	Identify progress in reducing copper discharges Improved water quality	Cost
b) Install treatment plant at electroplating companies	Individual plating companies	Improved water quality Recovery of copper and waste minimisation	Capital and revenue costs
c) Close Queniborough STP and divert to Wanlip STP	Severn Trent Water	Improved water quality in Queniborough Brook	Cost. Risk that waste minimisation benefits will not be seen and no nett reduction in toxic metal load to River Soar system
d) Review copper limits for Wanlip STP if diversion proceeds	Environment Agency	Improved water quality Nett reduction in copper load to River Soar catchment	Cost. Technical difficulty as relatively small increase in load to the larger STP

Issue 16: Local air quality in Leicester City

The main area of concern in this area with respect to local air quality is Leicester City. There are periods of poor quality air episodes due to high levels of Ozone, particulate Matter (PM₁₀), Sulphur dioxide and oxides of Nitrogen. Air quality data is obtained from a network of automatic monitoring stations on behalf of the Department of the Environment

One of the major sources of these pollutants is exhaust emissions from motor vehicles. The local authority is responsible for local air quality issues, but the Agency will participate in managing these issues.

ISSUE NO: 16	Local air quality in Leicester City		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Work together to manage local air quality in Leicester City	Leicester City Council The Agency	Sharing of expertise	Statutory responsibilities

Issue 17: Litter on and around the River Soar

The major problem areas are the backwaters of the river and Abbey Park Basin through Leicester, where accumulated litter gathers on the silted river bed.

Litter watches are run by Leicester City Council and there are plans afoot to dredge the basin. The Inland Waterways Association is also organising litter pick ups in the Loughborough area, which will be extended if successful. There appear to be opportunities for collaborative projects.

ISSUE NO: 17	Litter on and around the River Soar		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Education/ awareness of general public to the problem	Tidy Britain Group Environment Agency	Aesthetic protection of ecology and wildlife	Voluntary efforts
b) Litter watches /pickups	Leicester UA Inland Waterways Association		
c) Dredging of basin	Leicester UA Environment Agency		

Issue 18: Derelict land

Within and adjacent to the north eastern part of the area are numerous areas of derelict land. This land is not necessarily contaminated or known to contain pollutants as a result of previous activity, but each site presents ideal opportunities for other activities that can lead to temporary pollution of the air. Such activities include fly tipping, cable burning, aluminium smelting, flame cutting of transformers, as well as household waste left by travelling itinerants passing through the area. More permanent pollution of the land or nearby watercourses can also occur. In theory there are regulatory procedures that can be used to uphold the 'polluter pays' principle in such cases, but in practice, catching the

culprits and obtaining evidence of a standard to prosecute is another matter.

Regulatory procedures are only one way of tackling the problem, and in general, the Agency policy is to move towards prevention measures, to avoid the likelihood of pollution occurring.

Restoration of the sites to provide land which could be put to a beneficial use represents a way forward. This may present many opportunities for the Agency to form partnerships with other bodies to accelerate restoration and make a significant difference to the local environment.

There are many potential partners with whom the Agency could forge partnerships. These include Local Authorities, English Partnerships, British Coal, The National Forest and major landowners. There are others. Funding is generally available from many sources, including the EC, and therefore this may not be an appropriate input for the Agency. Whilst the Agency's individual departmental functions have contributed to derelict land restoration prior to the Agency's existence, there is now the opportunity for the Agency to act in a more coordinated manner through an integrated approach not previously possible.

The Agency would welcome comment, ideas, and input from the public as to how best the Agency could contribute to accelerating the restoration of derelict land.

ISSUE NO: 18	Derelict land		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Investigate the potential for partnerships to accelerate derelict land restoration	Environment Agency Local Authorities English Partnerships British Coal National Forest Major landowners Developers	Land put to beneficial use, less likely to attract polluting activities	Costs Manpower

Issue 19: Landspreading of controlled waste

The disposal of specified controlled waste to land is of concern to the Agency.

Certain activities involving the disposal of these wastes are exempt from the need to be licensed where they are registered with the Agency, meet criteria laid down in the Waste Management Licensing Regulations 1994 and will not give rise to pollution.

Specified controlled waste can be applied to agricultural land where it is for the purpose of benefitting agriculture or improving the ecological quality of the land. Wastes disposed of in this manner are usually organic in nature. In the plan area these normally consist of

food and drink processing waste. There are restrictions on the type of wastes and rates of application. Further restrictions are imposed on the waste that can be applied to forests, parks and similar public open spaces.

The disposal of other specified controlled wastes can be registered exempt where the land requires treatment, but it can only be carried out in accordance with a valid planning permission. It must also result in a benefit to agriculture or ecological improvement. There is a restriction on the quantity that can be deposited in a given area.

Other disposal activity can be registered exempt where specified controlled waste is used for the purpose of construction work, providing recreational facilities, in the construction, maintenance, improvement of a building, highway, railway, airport, dock or other transport facilities on the land.

Full details on the allowable wastes and limits to disposal are contained in the Regulations quoted above.

All the above activity raises concern with the Agency. The volumes of waste involved in deposits can be considerable. That of organic waste to agricultural land can and has reached 10 % by weight of the total industrial waste arising in the plan area. The total of all wastes disposed of under exemptions can exceed the input to a small to medium sized landfill site. There are many benefits to be gained from landspreading, but these must be balanced against the risk of pollution occurring through the lack of preventative control measures.

Pressure by the waste industry for an increase in registered exempt disposal activity is likely to increase as the full implications of the Landfill Tax are felt.

The Agency has a duty to carry out appropriate periodic inspections of landspreading activity. This is primarily a monitoring role. Generally the Agency can only take direct action AFTER pollution has occurred. Because of the potential for pollution through the lack of direct regulatory controls, and the quantities of waste involved, the frequencies of inspection may need to be greater than those specified for a licensed waste facility. This has an obvious resource implication to the Agency, which will exceed the current ability if the pressure noted above is realised.

ISSUE NO: 19	Landspreading of controlled waste		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Consider ways to raise profile of "pollution prevention" as a control option.	Environment Agency	Reduction in both potential for harm to human health and land and water pollution	Methodology Manpower Cost
b) Consider ways to carry out increased inspection workload.	Environment Agency	Further inspections would increase earlier awareness of pollution having occurred	Manpower Cost

3.4 Opportunities for development

Issues 20 to 23 focus on development and management of our environmental resources and the potential for further development opportunities, particularly opportunities to encourage sustainable development.

Issue 20: Recreational access along the River Soar

The River Soar area has great potential for the development of recreation. The attractive riverside locations along the course of the river regularly attract members of the public engaging in a wide range of activity. These range from bird watching and walking to water based activities, such as canoeing and pleasure boating.

Although the potential for recreational development exists, it is important that any future development takes into account the need to protect sensitive habitats and species at all times, as well as the rights of riparian landowners.

British Waterways has responsibility for managing the River Soar/ Grand Union Canal Navigation and consequently controls all pleasure boating activity.

ISSUE NO:20	Recreational access along the river Soar		
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Annual River Soar Recreation forum to be instigated	Environment Agency British Waterways All users	Communication, education, represent all interests and seek resolution of issues	Manpower
b) Promote creation of a Soar Valley Trail	Environment Agency British Waterways Local Authorities Countryside Commission	Link urban areas to the countryside Improve recreational access to the countryside	Landowner consent Availability of resources
c) Investigate excessive weed growth in Leicester Mile Straight	Environment Agency British Waterways	Improved fishing and boating access	Nature conservation
d) Create boating facilities in Leicester	British Waterways	Access for river users to Leicester	Availability of resources
e) Consider needs of disabled in recreation	All	Improved recreational access for all	Availability of resources
f) Balance interests through consultation.	All	Maintenance of biodiversity and of natural features upon which recreation depends	Agreement of interested parties
g) Undertake corridor study of River Soar in Leicester	Leicester UA Countryside Commission Environment Agency	Target recreational development of River Soar in Leicester	Availability of resources to implement findings of study

Issue 21: Lack of definition of floodplains

In order to control the floodplain effectively it is necessary to have accurate definition of its extent. A lack of historical data, combined with recent significant improvements to the river system in the Soar plan area require new floodplain definition in some areas. These floodplain maps are necessary for the Agency to make recommendations to LPAs as a statutory consultee on development proposals.

Development in the floodplain will be at risk from flooding and may increase the risk of flooding elsewhere by reducing the storage capacity of the floodplain and/ or impeding the flow of floodwater. The raising of ground levels by tipping in the floodplain or following the restoration of gravel workings may have a similar effect and as such are a potential flooding threat to people and property.

Sections of main river in the Soar area have been modelled and floodplain outlines have been produced for the River Soar downstream of Leicester, part of the River Wreake and Rothley Brook. Floodplain mapping is now required for the upper reaches of the River Soar, the River Sence, Broughton Astley Brook and other main rivers not included in the Floodplain Mapping Programme. The Agency has recently produced a Policy and Practice for the protection of floodplains.

ISSUE NO: 21	Lack of definition of floodplains		
ISSUES/OPTIONS	Responsibility	Benefits	Constraints
a) Complete floodplain mapping for main rivers identified	Environment Agency	To effectively control development in the floodplain and thus reduce the risk of flooding to people and property	Cost
b) Discuss problem of gravel workings with LPAs	Environment Agency Local Planning Authorities	To resolve existing problems with gravel workings and to avoid future problems	

Issue 22: Improvement of flood forecasting systems

The Agency aims to provide a service for main river flood warning which gives two hours notice of flooding. The existing system has in the past failed to provide accurate and reliable warnings. The geology and topography of the Soar area makes it particularly vulnerable to flooding. The flood forecasting and warning system for the Soar area needs updating particularly as the Agency became the lead authority for Flood Warning on 1st September 1996. Large areas of urban development, the complex interaction between the River Soar and the Grand Union Canal, where the river is the navigable waterway for long stretches, the use of automatic gates to mitigate flooding and major areas of embanked washland make the Soar catchment particularly difficult to model and forecast.

Various studies have been carried out to investigate the current flood forecasting system and recommend improvements to increase the accuracy of the system. The

recommendations need to be taken up and an effective new flood forecasting system for the Soar area developed to provide the appropriate standard of warning against flooding.

ISSUE NO: 22		Improvement of flood forecasting systems	
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Undertake recommendations of Wallingford Water Report into Flood Warning Methodology for the River Soar, taking into account the December 1995 report by JB Chatterton & Associates and WS Atkins (Water)	Environment Agency	Improve flood warning system and thus provide a better level of service to the public	Cost Certain areas in the upper reaches will not benefit due to the short time between the rainfall and corresponding runoff

Issue 23: The growth of aquatic plants is preventing the spawning migration of fish on the River Eye at Hams Bridge

Excessive growth of aquatic plants in the River Eye upstream of Melton is obstructing the normal spawning migrations and larval migrations associated with a normal fish population. This has led to poor recruitment within the fish populations, with the result that isolated pockets of very old fish dominate in areas of the river free from weed.

A strategy needs to be agreed with English Nature concerning weed control and river management that balances the needs of fish migration with the ecological interest of the SSSI.

ISSUE NO: 23		The growth of aquatic plants is preventing the spawning migration of fish on the River Eye at Hams Bridge	
OPTIONS/ACTIONS	Responsibility	Benefits	Constraints
a) Produce a management strategy for the River Eye at Hams Bridge	Environment Agency English Nature National Farmers Union	Maintenance of an open water channel allowing unrestricted fish movement Enhancement of river ecology	Retention of conservation value of SSSI Landowners consent and land management

Section 4 Protection through partnership

This section highlights the need to work together, if we are to make any lasting environmental improvements to the Soar area. As all aspects of the environment interrelate, we must seek to manage the environment as a whole. This can be achieved through partnerships.

- 4.1 Land use planning**
- 4.2 Partnerships with other groups**
- 4.3 Education**

4.0 Introduction

Our natural environment is complex. Even where we do have a good understanding of a particular element of the environment, what is often less obvious is how it interacts with all other aspects of the local, regional, national and global environment. It is becoming clear that even local environmental impacts can have knock on effects on other parts of the environment. It is this kind of understanding that led to the Rio Earth Summit in 1992, the adoption of sustainable development principles and the commitment to manage the environment in an integrated way through partnership. (See section 1.3).

Partnership will enable the key objectives and the long term vision of the plan to be realised. This plan discusses a number of issues, which to progress will involve the joint action of a number of organisations and individuals within the Agency. These include the relevant Local Authorities, water utility companies, English Nature, MAFF, Countryside Commission, Landowners, commercial companies, river user groups and conservation groups.

The Agency is well placed to influence many of the activities affecting the environment through legislation. The actual achievement of environmental improvements however depends upon cooperation between the Agency and others. The 1990 Government White Paper "This Common Inheritance" recognised the need for such cooperation when discussing the overlapping responsibilities of local planning authorities and environmental enforcement agencies. Subsequent international agreements and government guidance has further established this principle of cooperation and partnership.

4.1 Land use planning

4.1.1 Planning liaison

Town and country planning undertaken by Local Planning Authorities (LPAs) is the usual means for determining changes in land use. This is carried out through development plans and the implementation of development control by the LPAs. As planning decisions can have a significant impact on the environment it is important that the Agency contributes to the process where appropriate.

A considerable range of statutory and non-statutory planning consultations are received by the Agency from LPAs enabling the relevant planning committee to consider the Agency's views in determining the application. Guidance regarding the applications the agency would wish to see is contained in our "Environment Agency - Liaison with Local Planning Authorities" document (to be published shortly at the time of publication of this document).

Table 3 shows the current status of Development Plans in the area.

4.1.2 Local planning guidance

Development plans are particularly important as they set the framework for development into the future and are a key matter in the determination of planning applications. As a statutory consultee in the development plan process, the Agency welcomes the opportunity this offers to join the LPAs in promoting sustainable development. To provide a guide to LPAs on what water environment protection

Table3 - Status of Development Plans

LOCAL PLANNING AUTHORITY	% OF LPA IN PLAN AREA	POP. EST. IN PLAN AREA	DEVELOPMENT PLAN TITLE	STATUS AND CONSULTATION DATA
Leicestershire CC	61	733,524	Leicestershire Structure Plan Leicestershire Minerals Local Plan Review	Adopted January 1994. Adopted May 1996
Blaby DC Council	100	85,300	Blaby District Local Plan	Deposit Draft Nov 1994 Public Inquiry (Feb 1996)
Charnwood BC	100	153,200	Borough of Charnwood Local Plan	Consultation Draft (Feb 1995) Public Inquiry (Late 1996)
Harborough DC	46	31,406	Harborough District Local Plan	Deposit Draft (Feb 1995) Public Inquiry (Summer 1996)
Hinckley and Bosworth DC	45	49,297	Hinckley and Bosworth Local Plan	Consultation Draft (July 1994) Deposit Draft
Leicester UA	100	293,400	City of Leicester Local Plan	Adopted (Dec 1994)
Melton BC	65	37,032	Melton Local Plan	Deposit Draft (Aug 1995) Public Inquiry (June 1996)
North West Leicestershire DC	45	27,264	North West Leicestershire Local Plan	Deposit Draft (May 1995) Public Inquiry late summer 1996)
Oadby and Wigston BC	100	53,100	Oadby and Wigston Local Plan Public Inquiry October 1996	Deposit Draft (Jan 1996)
Rutland UA	15	3,525	Rutland Local Plan	Consultation Draft (April 1995)
Nottinghamshire CC	>1	10,523	Nottinghamshire Structure Plan (Review) Nottinghamshire Minerals Local Plan	Deposit Draft (April 1994) Examination in Public (Jan 1995) Modification on Deposit (March 1996) Deposit Draft (Sept 1993 Public Inquiry (Oct 1994)
Rushcliffe BC	20	10,523	Rushcliffe Borough Local Plan	Deposit Draft (Spring 1993) Public Inquiry 1994

Rugby BC	4	75	Rugby Local Plan	Inquiry (Autumn 1995) - Inspectors Report Awaited
Warwickshire CC	>1	75	Warwickshire County Councils Structure Plan	Structure Plan Alterations 1985-2001 - adopted 6.9.1991

policies should be included in development plans and why they are important, the NRA published "Guidance Notes for Local Planning Authorities on the Methods of Protecting the Water Environment Through Development Plans" (January 1994). A replacement publication containing additional guidance to reflect the Agency's Integrated Pollution Control (IPC) responsibilities is programmed.

The Agency welcomes early contact by LPAs on development plan preparation and will provide support, information and guidance where appropriate. We also welcome informal approaches by prospective developers to discuss any potential impact of their proposal. Discussions at an early stage help to identify and resolve possible problems before planning applications are submitted and should ensure that the Agency's response time is minimised when formal consultation is undertaken by the LPA. In addition pre-submission discussions will permit an applicant to carry out site investigations and identify the need for mitigation works at the earliest possible stage. Opportunities for enhancement can be identified which can contribute significantly to achieving the Agency's objectives in the interests of the community. Advice given to developers will be consistent with the advice given to the LPA by the Agency.

LEAPs, in addition to providing a vision for the future, set out problems, issues and actions within the plan area, providing an important source of information to LPAs. This is recognised in RPG 8 "Regional Planning Guidance for the East Midlands" (Government Office for the East Midlands March 1994), which indicates LEAPs (as successors to Catchment Management Plans) should also be taken into consideration by LPAs when preparing Development Plans. Similarly, the Agency considers Development Plans and liaises with LPAs when preparing LEAPs.

4.1.3 Planning guidance statements

1) The Agency will encourage all Local Authorities to adopt a precautionary approach to development which might **affect the water environment** in this area. The effects of development on the water environment should be considered so as to minimise its adverse impacts and maximise potential benefits. In particular, we will work with developers and others to encourage inclusion of environmental enhancements, including integration of existing watercourses and wetland habitats, as part of development wherever appropriate. Hard engineering of watercourses will be actively discouraged.

Charnwood BC Deposit Draft	Policy EV32
Regional Planning Guidance 8	Para. 8.1
Leicestershire Structure Plan	Policy SP1
Leicester City Council Adopted Plan	Policy ST1
Oadby and Wigston BC Deposit Draft	Policy SP1

2) Full account needs to be taken of the availability and provision of **sewerage and sewage treatment facilities** in considering the location, extent and timing of new developments. A few smaller villages and some larger settlements (such as Zouch) in the plan area have inadequate sewerage facilities or no sewerage provision at all.

Harborough DC Deposit Draft	Policy RM5
Charnwood BC Deposit Draft	Policy EV33
North West Leicestershire DC Deposit Draft	Policy S4
Hinckley and Bosworth BC Deposit Draft	Policy NE14
Blaby DC Deposit Draft	Policy CF7

3) Full account needs to be taken of the **availability and provision of water supplies** in considering the location and extent of significant new developments. The key issues are quantity, location, and source (i.e. surface water or groundwater) of abstractions. The Agency supports measures that minimise waste through leakage control and demand management, and looks to the Water Companies to meet current and increased demands in an environmentally sustainable manner.

Harborough DC Deposit Draft	Policy RM1
Melton BC Deposit Draft	Policy OS3
Regional Planning Guidance 8	Paras 13.1 - 13.3

4) The conservation, fisheries, landscape, heritage/archaeological and recreational value of local **river corridors** needs to be protected and enhanced. This includes protection under conservation legislation such as designation of Sites of Special Scientific Interest (SSSIs), Scheduled Ancient Monuments (SAMs), Sites of Interest for Nature Conservation (SINCs) and so on, and guidelines such as those produced by the Forestry Authority. It also involves prevention of soil erosion by inappropriate riverside land use and the consideration of increased flood risk. The value of buffer zones and sensitive riparian management is recognised.

North West Leicestershire DC Deposit Draft	Policy E24
Melton BC Deposit Draft	Policy C11
Hinckley and Bosworth BC Deposit Draft	Policy NE5
Regional Planning Guidance 8	Para. 13.6
Oadby & Wigston BC Deposit Draft	Policy CP1

5) The **floodplains** of rivers and watercourses in the catchment need safeguarding from encroachment by development.

Charnwood BC Deposit Draft	Policy EV33
NorthWest Leicestershire DC Deposit Draft	Policy E28
Leicester City Council Adopted Plan	Policy U1
Rutland DC Deposit Draft	Policy UT7
Regional Planning Guidance 8	Para. 14.7
Blaby DC Deposit Draft	Policy CF5

6) The management of **contaminated land** sites is not raised as an issue in the LEAP. There are, however, a number of Waste Disposal Sites, industrial sites and old mineworking sites where pollution problems have potential to occur. The management of waste disposal sites must give due care to the protection of surface water and groundwater from pollution in their construction, operation and aftercare. Proposals for restoration of worked-out mineral sites can present opportunities for environmental enhancement, including features of historic interest, and should be encouraged.

Oadby & Wigston BC Deposit Draft	Policy C11
Leicester City Council Adopted Plan	Policy U10
Melton BC Deposit Draft	Policy M2
Hinckley and Bosworth BC Deposit Draft	Policy NE16
Rutland DC Deposit Draft	Policy WA2
Blaby DC Deposit Draft	Policy M3

7) **Tourism and countryside recreation** in the Soar plan area has increased in recent years, and there are likely to be increasing pressures in the future. The catchment's rivers and watercourses are an integral and attractive part of the countryside scene, and are likely to play an increasingly important role in tourism and water-based recreation. The Agency will liaise with Local Authorities and developers to ensure such developments are sympathetically designed and located to take into account the safeguarding of the water environment, and where possible its enhancement. The development and promotion of water-based recreation facilities should take into account the need to safeguard the area's high quality riverine habitats. Sensitive areas should be protected from recreational pressure, and should be targeted for monitoring.

Charnwood BC Deposit Draft	Policy RT13
Melton BC Deposit Draft	Policy R10
Leicestershire Structure Plan	Policy LP7
Harborough DC Deposit Draft	Policy LR2 & 3

8) (i) Developments should not normally be permitted which in the opinion of the LPA, after consultation with the Agency, pose an unacceptable risk of pollution of surface waters, either directly or via the surface water sewerage system.

The LPA should ensure that all new industrial and commercial developments have adequate means of foul and surface water drainage. Hardstandings, roadways and storage areas must be properly drained with oil interceptors or other pollution prevention measures as required. All above ground oil tanks, chemical stores and sources of polluting material must be bunded or otherwise contained and the containment properly maintained for the life of the facility.

(ii) Surface water and run-off should (as far as is practicable) be treated at the source on all new developments through the use of swales, wetlands, soakaways, permeable pavements and roadways etc.

This is to ensure aquifer recharge, improved water quality and the maintenance of the natural regime of flows in watercourses. This approach may not be suitable in areas suffering from the problem of rising groundwater.

Oadby & Wigston BC Deposit Draft	Policy C11
Charnwood BC Deposit Draft	Policy EV40
Hinckley and Bosworth BC Deposit Draft	Policy NE13
Rutland DC Deposit Draft	Policy EN2
Harborough DC Deposit Draft	Policy RM4

4.2 Partnerships with other groups

There are a number of joint initiatives with local authorities and other groups that have already been undertaken or are in progress. Examples are highlighted below.

4.2.1 Local Agenda 21

Sustainable development was given added impetus when the UK and other governments signed up to Agenda 21 at the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992. This is an environmental action plan for the next century, which recognises the central role of local authorities and the value of partnerships and the local community in achieving sustainable development.

One of the most progressive things about Agenda 21 is that it recognises that action by National Governments alone is not enough and that all groups - civic, community, business and industrial have to be involved to bring about change. Thus, local authorities were expected to have undertaken a consultative process with their population and achieved a Local Agenda 21 for their community by 1996. A Local Agenda 21 Action Plan is being drawn-up.

4.2.2 Forum for a Better Leicestershire

The Forum for a Better Leicestershire brings together representatives of business, environment, public bodies, academic organisations and local groups to work towards sustainable development in Leicestershire. The Forum produced a State of the Environment Report in 1995 which was a snapshot study of the quality of the environment in Leicestershire and provided a foundation on which to start a Local Agenda 21 programme. In 1996, interest groups and individuals were consulted to discover the key local issues that people in Leicestershire care about. The

Forum is currently working on an action plan to address the issues that have arisen out of the consultation.

4.2.3 The Leicestershire Waste Minimisation Initiative.

The Leicestershire Waste Minimisation Initiative (LWMI) helped 10 small and medium sized companies from the textile, construction, engineering and food and drink industries to reduce their waste costs and operate more efficiently. Waste minimisation involves avoiding, reducing or eliminating waste within the production process.

In 1994, a team of Project Partners appointed technical consultants to carry out waste audits in each of the companies. The audits concluded that if all 10 companies implemented waste minimisation projects, the potential financial savings could total £3 million. After 2 years of implementation the actual savings are approximately £1.3 million. The environmental savings from the projects so far include a 10% reduction in water use and effluent; 50% reduction in air emissions and 50% reduction in solid waste to landfill.

The LWMI partnership team consists of the Environment Agency, the BOC Foundation for the Environment, the DTI, Severn Trent Water, Leicestershire Training and Enterprise Council and East Midlands Electricity Plc. The Project Partners each committed funds to the Initiative. They directly manage the project through a steering group.

The LWMI launched a dissemination programme in July 1995 to show other small and medium sized businesses the benefits of adopting waste minimisation techniques. The results achieved by the 10 companies helped to demonstrate how waste minimisation works in practice. The programme consisted of a series of informative seminars and training workshops.

4.2.4 Blueprint for Leicester

Blueprint for Leicester is the city's Local Agenda 21 programme. In October 1995, the Blueprint Findings report was published which contains the results of an extensive consultation with a broad cross section of the community of Leicester. The issues raised by the people questioned include, concerns for the protection of open space and parks in the city, the availability of affordable recreational facilities and the quality of the local environment, particularly the effects of motor vehicle emissions on air quality. The Blueprint for Leicester sets a series of goals for the economy and the environment. Many of the goals reflect the concerns of the Agency. For example they include; the promotion of clean technology as an economic opportunity for local industry; setting up a framework to reduce pollution to local water, air and land; and encouraging people to reduce their waste. The Agency looks forward to full and active participation in this process.

4.2.5 Other Conservation and Recreation collaborative projects

Another area of work that is dependant on a partnership approach is:

* **Landscape and cultural heritage**

As many of the designations applied to landscape, historical or archaeological sites are non statutory, the Agency has to work in partnership with local authorities and other external bodies such as the Countryside Commission to ensure that they are protected.

It is important that the Agency is aware that many archaeological and historical sites and remains are also at risk because they are as yet undiscovered. The Agency's conservation staff do not have any archaeological expertise. Consequently they liaise closely with the archaeological community to obtain the advice necessary to carry out the Agency's duties with regard to its own works as well as conserving other work.

4.3 Education

The Agency sees education as an important part of its work. In many cases, a lack of information and awareness is one of the factors which leads to environmental damage or neglect, whether it be accidental or deliberate. The Agency has recently published its education strategy "Green Shoots" which considers environmental education into the next century.

Our goals are to:

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

The production of this LEAP and the summary leaflet that goes with it is one step towards increasing the accessibility of information about everyone's local environment. However more needs to be done to raise awareness of the existence and importance of issues facing our local environment. We all have a role to play in making this happen.

PART II

SUPPORTING INFORMATION

Introduction

Part I of this report introduced you to the Agency and the LEAP Process. In detail it described the Soar environment and the key issues associated with the area. Options and proposals have been identified together with the key partners who, with the Agency are committed to and responsible for the environmental improvements.

Part II of this report gives you information on the activities and uses which pressure the local environment. Pressures alter the state of the environment which drives a need for management through objectives and targets for environmental quality. These will protect the most sensitive aspect of the resources, often human health and wildlife diversity. The current status of the catchment is compared with the targets and where there is a shortfall this has been raised as an issue in Section 3.

Part II

- * Section 5 Uses, activities and pressures
- * Section 6 State of the environment

Section 5 Uses activities and pressures

This section details the current and future uses, activities and pressures in the area. A general description of the nature of the Agency's responsibility is given, followed by the local perspective.

National and European legislation impacts on the environment and also on the activities of the Agency. Appendix 5 lists the legislation that has the greatest relevance.

- 5.1 Development and infrastructure**
- 5.2 Heavy industrial processes**
- 5.3 Storage and disposal of radioactive materials**
- 5.4 Minerals and non renewable energy resources**
- 5.5 Renewable energy**
- 5.6 Power generation**

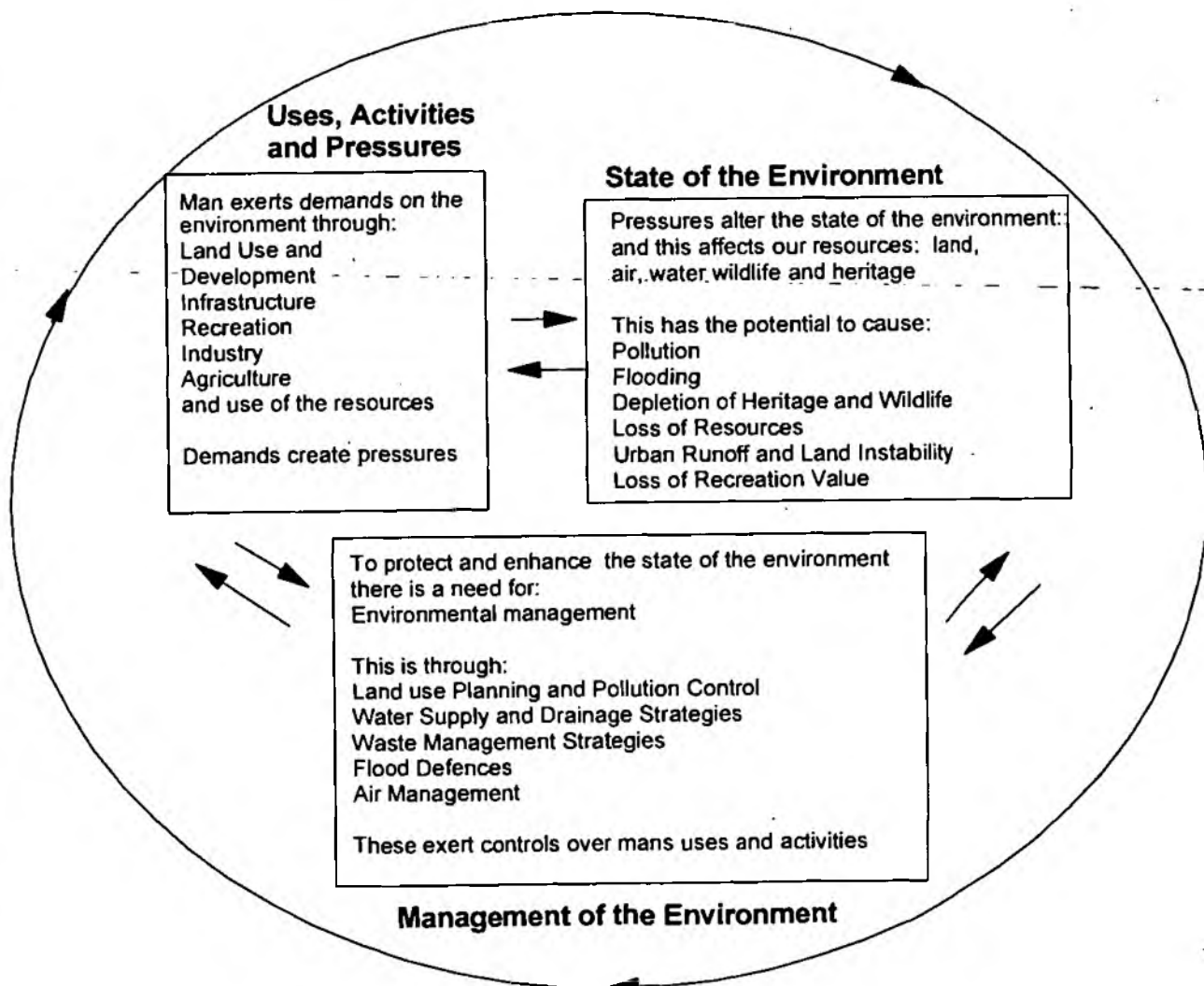
- 5.7 Water resources and abstraction**
- 5.8 Sewage and industrial effluent disposal**
- 5.9 Surface water drainage and flood defences**
- 5.10 Waste management**
- 5.11 Contaminated land**

- 5.12 Agriculture and forestry**
- 5.13 Conservation and recreation**
- 5.14 Fisheries**
- 5.15 Heritage**
- 5.16 Recreation and navigation**

5.0 Introduction

Human activities exert pressures on the environment and change its state in terms of its quality and its stocks of natural resources. If we are to make good management decisions about the environment we need information on the uses and activities that are carried out in the area. This will enable us to consider the pressures that these activities exert on our natural resources and ultimately the state of that environment. The figure below illustrates the idea of environment management.

Figure 4 Management of the environment



5.1 Development and Infrastructure

5.1.1 General

New building works, changes in land use, development of communications and the construction of new roads, sewers and other services can have a major impact on an area and uses of the environment. Whilst the Agency has a responsibility to protect the environment, to achieve this aim it must work closely with Local Planning Authorities (LPAs).

The Agency is a statutory consultee under planning legislation and advises Local Authorities on development proposals that can have an impact of matters relevant to the Agency. To facilitate this process, the NRA produced a series of Guidance Notes for LPAs. A replacement publication containing additional guidance to reflect the Agency's air and waste responsibilities is programmed.

The Agency also seeks to pursue its aims and policies regarding development through the planning consultation process for individual proposals. Although the final decision on planning matters rests with the LPA, government guidelines advise on the need to consider the Agency's concerns when determining proposals.

A major objective of this LEAP is to provide the LPAs with a clear picture of the Agency's responsibilities and policies towards development of this area. The plan identifies all legitimate uses of the plan area so that these interests can be taken fully into account by LPAs in Development Plans.

5.1.2 Local perspective

The urban areas in the plan area comprise Leicester and its adjoining settlements and the towns of Loughborough, Melton Mowbray and Shepshed (see Map 8). These areas are and will continue to be the main centres for housing, employment, services and leisure in the plan area.

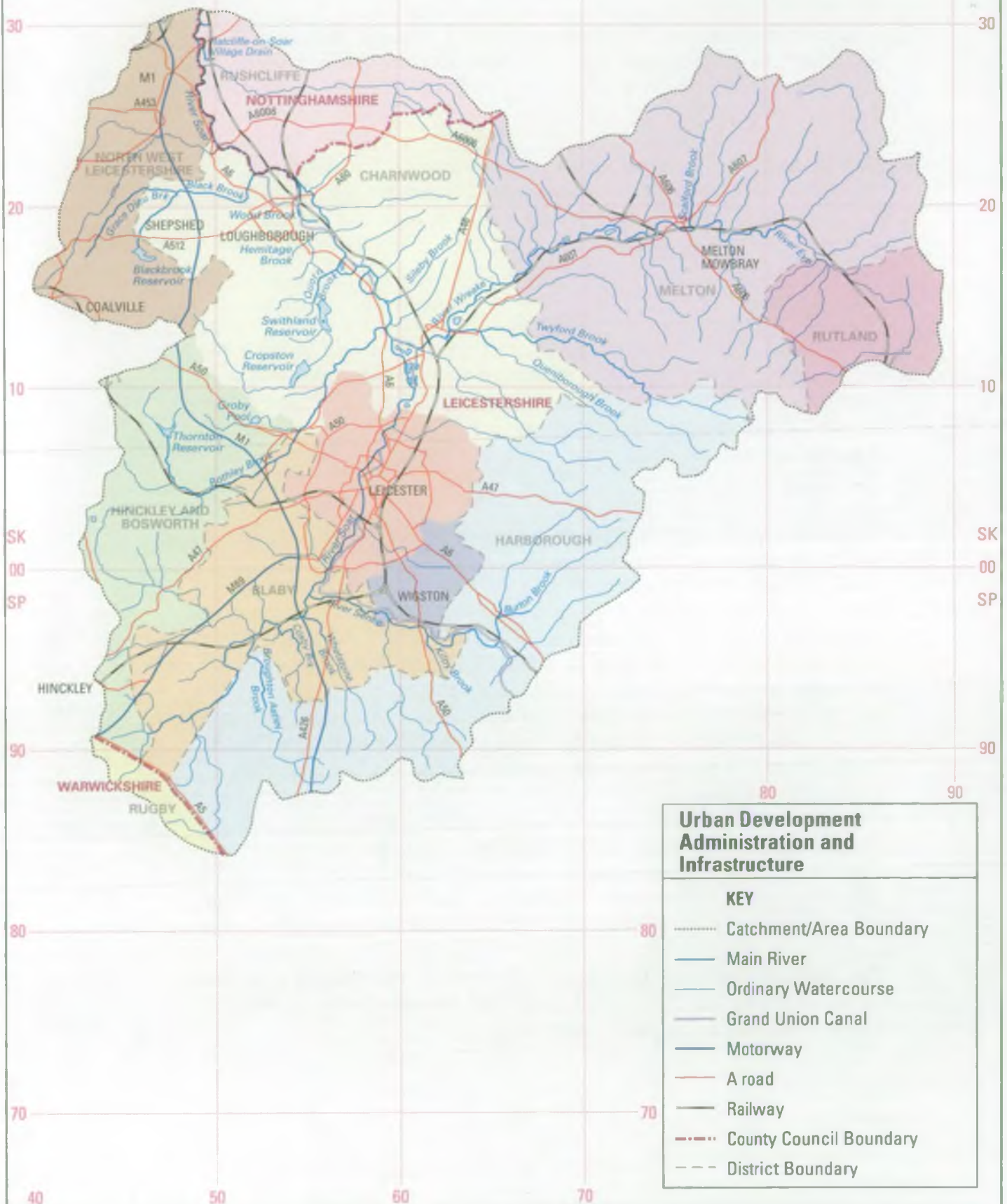
Land for all major new developments of housing, employment and other types of development, will take place within and adjoining these urban areas, and also at node locations along the transport corridors between the urban areas.

Small scale developments within or adjoining other settlements will normally only be appropriate when in keeping with their size, form and character. Within areas of particularly attractive countryside and areas of local landscape value, housing and employment development adjoining settlements will only be appropriate where there is no adverse impact on the appearance or character of the landscape.

**Soar
Local Environment Agency
Plan
Map 8**



**ENVIRONMENT
AGENCY**



The main priority areas for development are the inner areas of Leicester and the outer zones of Highfields, Saffron, Belgrave, Braunstone, West End and Northfields; the inner areas of Loughborough and the mining decline area of North West Leicestershire, covering the coalfield areas around Coalville.

The Leicestershire Structure Plan recognises a need for housing growth and identifies a requirement for 53,000 new dwellings to be built in the catchment as a whole (only 33,000 of which will be in the plan area), between 1991- 2006.

The economy of the area is still heavily reliant on a few traditional industries, such as textiles and engineering. In response to this situation, Leicestershire County Council has adopted a strategy that seeks to diversify the local economy, while at the same time supporting local industries.

The Leicestershire Structure Plan recognises the need for an increase in the quantity of land for employment use and provision will be made for the development of about 1035 hectares of land for industrial, office, warehousing and distribution sectors (B Class) between 1986 and 2006, of which 638 hectares will be in the plan area. Land is also allocated for a Regional storage and distribution centre well related to junction 23a/24 of the M1 motorway.

The area is well placed in relation to the national road network. The M1 motorway follows a north to south route along the western edge of the area, with the M69 branching off westwards at junction 21, south of Leicester to link with the M6. The A46 and A426 trunk roads bisect the area in an east to west divide, whilst the A47 and A50 do similar for a north to south split. The recently opened Leicester Western Bypass now classified as the A46 provides a direct link between the M1 junction 21A and the Fosse Way Roman Road (existing A46). The Syston Northern Bypass (A607) extends the through route to Melton Mowbray. The city of Leicester is at the approximate centre of the area with many trunk roads radiating from within.

Rail transport is served by the Midlands Main line, the Birmingham to Peterborough line and the recently reopened Leicester to Burton Line (the 'Ivanhoe Line'), which serves a number of local communities and helps reduce congestion on the roads.

East Midlands International Airport is situated in the extreme north-west of the plan area and represents an important resource in terms of the future economic development of the area.

Councils, Universities, services (such as British Telecom and the gas utility) and office based work dwarf heavy industry in the table of top employers. Of those top employers, retail, food and petfood outnumber those in light engineering or manufacturing industries.

5.2 Heavy industrial processes

5.2.1 General

Industrial processes regulated under the Environmental Protection Act 1990 are regulated either by the Agency or by the relevant local authority. In general, the Agency is responsible for regulating those processes having the greatest potential to cause pollution, the so called 'heavy' industrial processes.

5.2.2 Local

There are approximately 5,000 Part A processes in England and Wales, 11 of which were operating in the area at the beginning of 1997. Part A processes are those with the greatest potential for serious pollution to air, water and land. Those within the area are listed in table 5 below and on Map 10. In addition to these, a combustion process and two chemical plants are expected to be authorised during 1997. Table 4 below shows the amount of the main pollutants emitted to air during 1996 from the processes operated by the companies given in Table 5.

The Soar area has two main areas of development: Loughborough and Leicester, as shown on Map 9. Industry is predominantly based in or around these centres. Industry tends to be from those sectors with relatively low environmental impact, rather than heavy industry sectors such as metal foundries or large chemical works. This is borne out not only by employment in the area, but also the relatively small number and type of processes authorised under the Environmental Protection Act 1990 (Part A processes).

Table 4 Main air pollutants from Part A process sites

Pollutant	Quantity (Tonnes)
Volatile organic compounds	170
Sulphur dioxide	27,810
Oxides of nitrogen	28,630
Hydrogen chloride	1,257
Particulate matter	600

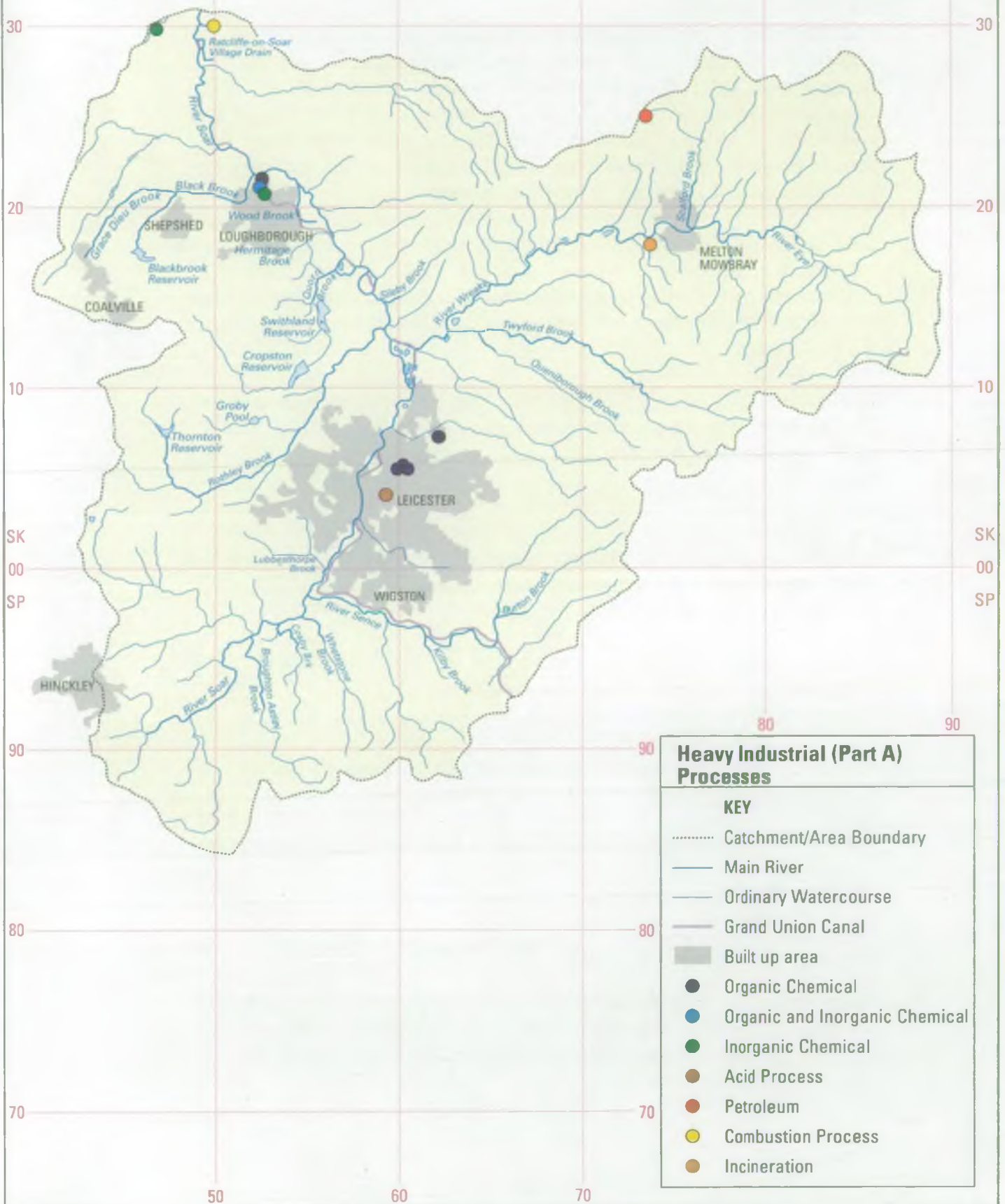
Table 5 Part A processes

Company	Type of process operated	Pollutants discharged
Astra Charnwood, Loughborough	Organic chemical pilot plant - manufacture of new chemical entities	Air: volatile organic compounds
Astra Charnwood, Loughborough	New pilot plant (not authorised yet as at 12/2/97)	Air: volatile organic compounds
Bostik Ltd, Abbey Park Rd, Leicester	Organic chemical pilot plant for patch trials of polyamide and polyester resins	Air: volatile organic compounds
Bostik Ltd, Ulverscroft Rd, Leicester	Organic chemical plant for manufacturing polyamide resins for adhesives	Air: volatile organic compounds
Bostik Ltd, Ulverscroft Rd, Leicester	Organic chemical plant manufacturing polyester resins for adhesives and sealants	Air: volatile organic compounds
Fischer Scientific (UK) Ltd, Loughborough	Organic and inorganic chemicals manufacture	Air: volatile organic compounds Water: heavy metals
GC Metals, Leicester	Recovery of gold and other precious metals from scrap using an acid process	Air: hydrogen chloride and oxides of nitrogen
GE Lighting, Leicester	Inorganic chemical process, manufacturing of light bulbs	Air: Particulate matter
Organic Specialties Ltd, Leicester	Organic chemical plant manufacturing intermediates and dyestuffs	Air: volatile organic compounds
Melrose Oil and Gas Ltd, Melton Mowbray	Land based crude oil well	Air: volatile organic compounds
Trent Valley Water Systems Ltd, Loughborough	Inorganic chemical process, manufacture of Iron chloride from scrap metal	Air: sulphides and hydrogen chloride
Powergen Plc, Ratcliffe on Soar	Large combustion process at power station	Air: sulphur dioxide, oxides of nitrogen, particulate matter Water: chloride, heavy metals

Soar
Local Environment Agency
Plan
Map 9



ENVIRONMENT
AGENCY



The installation of a flue gas desulphurisation plant at Ratcliffe on Soar Power Station has reduced the emissions of sulphur dioxide in the area by over 150,000 tonnes per year.

5.3 Storage and disposal of radioactive materials

5.3.1 General

The Radioactive Substances Act 1993 provides for controls to be exercised over the use and keeping of radioactive materials and the accumulation and disposal of radioactive wastes. The Agency is responsible for the administration and enforcement of the Act in England and Wales. This takes the form of registrations and authorisations; the former being required for keeping radioactive material and the latter for accumulating and disposing of radioactive waste.

All usages and disposals are subject to regulation by the Agency. Various exemption orders made under the Act permit the holding and disposal of radioactivity, where the use is widespread and the quantities involved are of such low magnitude as not to present a significant risk to the public or the environment.

Radioactive materials are used in a wide range of devices, such as density gauges, level detectors, antistatic units and flow meters. All of these devices require a registration.

In hospitals, universities and research companies, radioisotopes are used for treatments, diagnosis and labelling compounds. These activities require registration under the Act and generally result in the requirement for accumulation of the radioactive waste prior to disposal, which requires an authorisation to be issued by the Agency.

Nuclear licensed sites are also regulated by the Agency and require authorisations to dispose of radioactive waste.

5.3.2 Local perspective

Within the area, the Agency regulates 103 Section 7 and 16 Section 10 registrations and 18 Section 13 disposal authorisations.

The major disposers of radioactivity can be split into three categories:

- a) Three large hospitals in Leicester
- b) Three main universities
- c) Industrial manufacturing and pharmaceutical research

These three categories are authorised to release radioactivity to air, sewer, land and for incineration. Leicestershire does not have any facilities authorised to incinerate low level radioactive wastes from

hospitals, universities or research. This low level radioactive waste is transported by road to sites outside the area which hold authorisations to incinerate the waste.

There are no nuclear licensed sites in the area.

5.4 Minerals and non renewable energy resources

5.4.1 General

Areas of current or former mineral workings can pose a threat to ground and surface waters by exposing polluting spoil or veins of potentially polluting minerals to the weathering process. As a result, run off and discharges from quarries and mines can contain contamination and suspended material that are harmful to aquatic life. Discharges from active sites are subject to normal discharge consent procedures. However, discharges from abandoned mines are not adequately controlled by law and may cause locally severe problems.

The exploitation of minerals can have a major impact on water resources by altering groundwater flows and hence streamflows. The removal of material from above the water table reduces the opportunity for natural filtering and attenuation of pollutants, which will consequently enter the groundwater more readily. The dewatering of mineral workings is exempt from the need for an abstraction licence but a conservation notice may be needed to minimise the impact of such operations on the water environment. Reclamation with impermeable material will increase runoff and reduce the recharge of groundwaters, whilst the use of mineral extraction sites for landfill can also threaten groundwater quality and is not encouraged by the Agency in all locations.

Gravel extraction may take place from the river channel or floodplain and is controlled by planning law. It may also require a land drainage consent from the Agency. If extraction works are not properly managed, the river channel can be seriously damaged. There can also be serious implications for fish spawning sites.

All mineral workings are subject to general planning controls. The Agency is a consultee on such applications, and the final planning consent should contain conditions which control the operations in order to satisfy the Agency's requirements. Both the impact of the mineral working and its restoration need to be considered.

5.4.2 Local perspective

There are extensive mineral workings within the catchment which are of national importance and essential for meeting the local and regional community needs. The major minerals and non renewable resources are shown on Map 10. These include igneous rocks, fireclay,



KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- Sand-Gravel
- Coal
- Clay
- Gypsum
- Oil
- Igneous Rock

brickclay, sand and gravel and gypsum. The area is in general terms a net exporter of minerals and mineral related products.

Hydrocarbons can be included as mineral reserves and coal and oil reserves are exploited. Coal is mined at the relatively new mine at Asfordby, which is on the outskirts of Melton Mowbray. There are no other active deep mines in the area; vast coal reserves have however been proved by exploitation drilling in the area north and west of Melton Mowbray, forming a part of the Vale of Belvoir Coalfield. There are no operational opencast coal sites in the area. There is one oil extraction borehole at Rempstone, north east of Loughborough.

Gypsum deposits are found in the East Leake - Barrow on Soar area and these have been and continue to be exploited through deep mining operations.

Igneous rocks occur around the edges of Charnwood Forest at Shepshed, Cliffe Hill and Groby and also to the southeast of Leicester, at Enderby, Sapcote and Croft. These hard rocks are of great value as roadstone. They have been, and will continue to be, one of the largest producers of rock aggregate in the country.

In the Soar and Wreake Valleys and especially in the Leicester - Loughborough area extensive sand and gravel deposits occur and these are exploited for aggregate, both for buildings as well as for roads.

The vast clay deposits of the area are excavated for brick and tile making, at a few locations; all the workings however tend to be small in area.

5.5 Renewable energy and power generation

5.5.1 General

An essential part of the Government's environmental strategy is the reduction of emissions produced as a result of burning fossil fuels. the governments policy is to encourage the exploitation and development of renewable energy sources wherever they have prospects of being economically attractive and environmentally acceptable. The Agency is keen to support this policy through the application of its powers and duties.

Renewable energy sources include water (hydropower, wave and tidal), wind solar and geothermal power and energy derived from waste treatment. Some renewable energy sources, such as hydropower are commencing widespread commercial exploitation. Information about planning aspects of renewable energy is available in the Planning Policy Guidance Note on Renewable Energy (PPG 22 issued by the Department of the Environment and the Welsh Office)

The energy sources considered in this section are those that may impact on the water environment in one way or another. Hydropower is the main use considered, but reference is also made to wind power and energy derived from waste.

Power Generation - the United Kingdom uses fossil fuels, coal, oil and natural gas as sources of energy for the production of power. Those processes capable of achieving a rated thermal input of 50 mega watts (MW) or more are regulated by the Agency. The principal environmental impact from the combustion of fossil fuels is that of releases of gases to the atmosphere. Such releases affect the quality of the air both locally and globally.

The burning of coal is estimated to contribute about 34% of the carbon dioxide released into the atmosphere each year by the UK, the vast majority via power stations. The burning of gas is now estimated to account for some 24 %.

Burning fossil fuel also releases other gases into the atmosphere, particularly oxides of nitrogen, sulphur dioxide and particulate matter.

Water is used for the generation of hydro-electric power and is also a means of providing power to drive machinery, for example, mills. The Agency will take the use of hydropower into account in its management of water resources, and will aim to achieve the right balance between the need of the environment and those of the abstractors. Hydropower schemes which include a physical abstraction from the river require an abstraction licence from the Agency under S.24 Water Resources Act 1991, except where there is no abstraction from the main channel and no diversion of flow. An impounding licence (S.25 WRA 1991) will be required for schemes involving the construction or considerable alteration of impounding works such as dams and weirs. Consent under S.23 of the Land Drainage Act 1991 or S.109 WRA 1991 will also be required in all cases, and there may be a requirement for a fish pass together with screening of intakes and outlets if waters are frequented by migratory fish. Since hydropower abstractions often use the whole river flow, the granting of an abstraction licence has implications for later upstream development proposals. This can mean that no-one else would be granted a licence to abstract water upstream of a hydropower site. In such cases, it is the policy of the Agency to include provisions to permit further upstream abstractions up to a fixed maximum value, and to grant time limited licences. Adequate residual flow in the river between the abstraction and discharge point of a hydropower abstraction must be allowed for. This is critical for maintaining a passage for migratory fish and the preservation of the aquatic ecosystem within the length affected.

Wind Power electricity generating schemes are inevitably proposed in upland areas, where highest wind speeds are found. These areas generally coincide with the watersheds of river catchments, and include the sensitive headwaters, sources of streams and rivers.

Wind farms can impact on the water environment in two main ways - fragmentation of sensitive upland wetland habitat by the siting of turbines and interconnecting roads and tracks; and drainage from haul/access roads, transformers, substations and associated facilities. Any discharge of potentially contaminated drainage to a watercourse will require consent under WRA 1991. The construction of haul roads may involve crossing/bridging of watercourses, for which consent will be needed under S.23 Land Drainage Act 1991 or S.190 WRA 1991.

Wind generators have recently been added to the category of projects in Schedule 2 of the Town and Country Planning (Assessment of Environmental Effects) (Amendment) Regulations 1988, requiring submission of an Environmental Assessment if the development is likely to have significant environmental effects.

Waste Treatment as a means of producing renewable energy includes landfill gas (methane) from waste disposal sites and bio-gas projects (anaerobic digesters). By-products may be produced, and any polluting discharge to controlled surface waters will require a consent from the Agency under the provisions of the Water Resources Act 1991.

5.5.2 Local Perspective

The power station at Ratcliffe on Soar is situated seven miles south west of Nottingham, on the Nottinghamshire and Leicestershire border, between the rivers Soar and Trent, just within the Soar plan area. The station is a Part A process, regulated by the Agency (see Section 5.2 and Map 9).

Ratcliffe is a coal fired power station, capable of producing 2070MW of electricity at full load. This is sufficient to power two cities the size of Nottingham. The plant consists of four 500MW coal fired boilers and steam turbine generator units.

Coal is delivered by rail or road and may be stockpiled if not required immediately. The heat produced by burning coal is used to raise steam, which drives the turbine to generate electricity.

Condensers and eight 114 metre high cooling towers are used to condense and cool the spent steam for reuse. Combustion gases from the boilers are passed through electrostatic precipitators to remove particulate matter and then forwards to the flue gas desulphurisation plant, before discharge

via a 198 metre high chimney. Ratcliffe is one of only two operational power stations in England and Wales fitted with a flue gas desulphurisation plant which reduces emissions of sulphur dioxide by at least 90% and also reduces hydrogen chloride and particulate matter emissions.

Hydropower - extensive mill remains associated with the historical use of running water for power occur along the Rivers Soar and Wreake. There are, however, no hydropower schemes currently working in the plan area.

Wind power - there is clearly the potential for wind power generation in the plan area, and is in fact used at one location at least. The best locations are likely to be on the high land in the Charnwood Forest or the Wolds. The development of wind power in Charnwood Forest may conflict with long established policies seeking to protect this area's special landscape character. In the Wolds, because of the sweeping open character of the landscape, wind power developments would be difficult to incorporate into the landscape.

Waste treatment - power is generated from waste at the Enderby Warren landfill site.

5.6 Water resources and abstraction

5.6.1 General

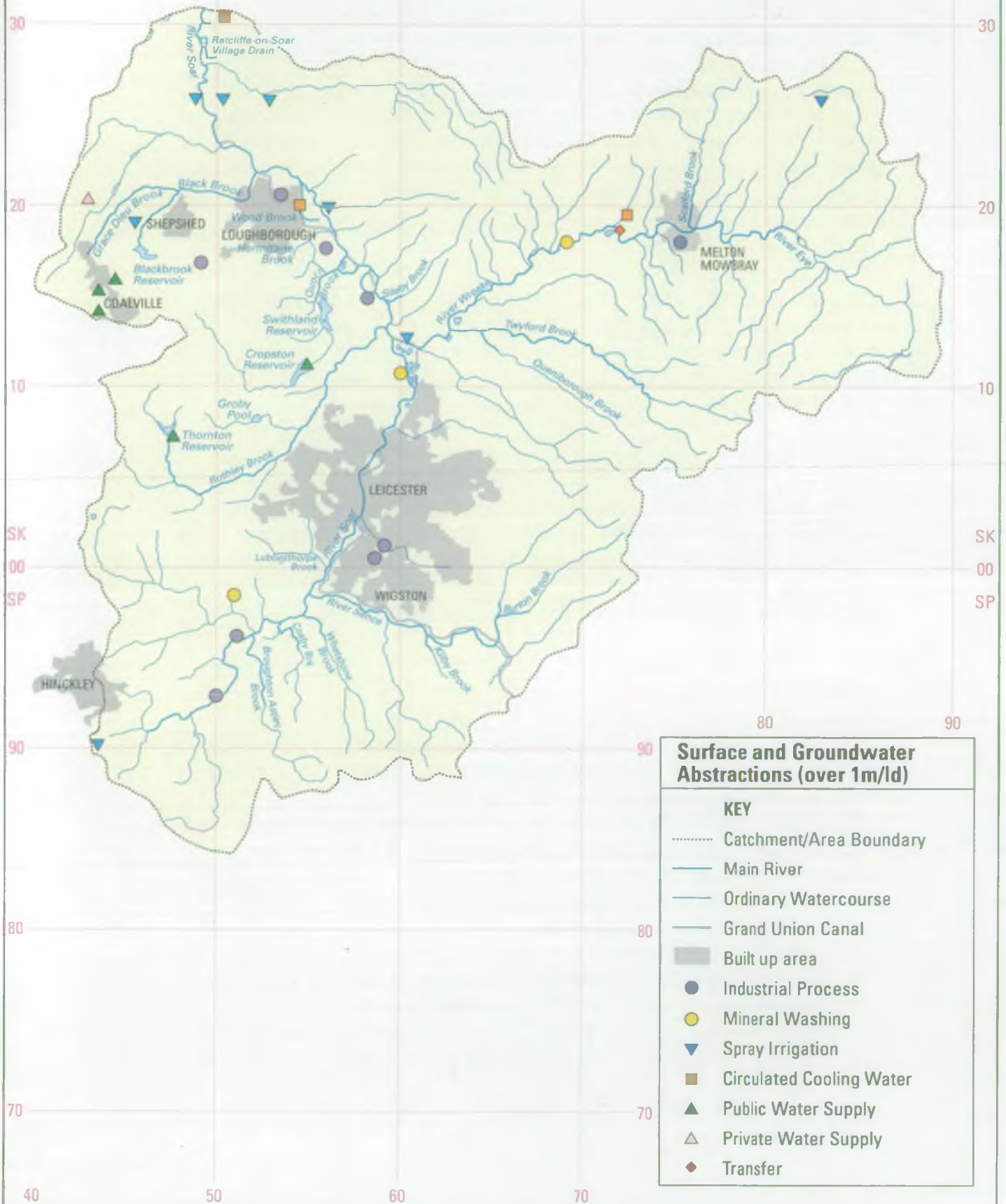
The removal of water from streams, rivers or groundwater by man is termed **abstraction**. Abstractions are controlled by licences granted under the Water Resources Act 1991. The abstraction licensing process ensures that the Agency can manage water resources so as to ensure that the right balance is struck between the needs of abstractors and the environment. Exemptions from the requirement for a licence include most types of water supplies to a single household, and small (less than 20 cubic metres a day) general agricultural uses from surface water (excluding spray irrigation). There are a number of other specific types of abstraction (eg fire-fighting) which are exempt from the need for a licence.

All abstraction licences specify maximum volumes that the licence holder may take, and many contain conditions to protect the environment and other abstractors. The exceptions are licences granted as licences granted as Licences of Right in 1965, or "Licences of Entitlement" in 1990 where the legislation did not permit the then NRA and its predecessors to restrict pre-existing abstractions. In considering applications for new licences, the Agency must ensure that there is no derogation of existing abstractors without their agreement, and that the aquatic environment and associated habitats are properly safeguarded. The Agency does not guarantee that the authorised volume will be available, nor that water will be fit for the and

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Map 11**



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**Surface and Groundwater
Abstractions (over 1m³/d)**

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- Industrial Process
- Mineral Washing
- ▼ Spray Irrigation
- Circulated Cooling Water
- ▲ Public Water Supply
- ▲ Private Water Supply
- ◆ Transfer

indeed in many parts of the area are the only option to obtain reliable purpose for which it will be used.

This use includes the supply of water from ground and surface sources for public supply and for industrial, agricultural, amenity, hydropower, water transfer and fish farm use. The public water supply in the region is derived from both surface water and groundwater sources. Private supplies are generally derived from springs, wells and boreholes, their quality is monitored by the Environmental Health Department of the Local Authority. The Agency does not guarantee the quality of the raw water or of the treated water. However, it does have a duty to protect water quality and specifies protection zones around groundwater sources to seek to control certain potentially polluting activities. The Policy and Practice for Protection of Groundwater forms the basis for the Agency's viewpoint in this Region.

Problems can occur when surface water is abstracted for spray irrigation as there is a large percentage loss through evapotranspiration. This problem is compounded in the summer months when spray irrigation demands are at their highest as flows are generally at their lowest at this time of year.

To minimise the impact on the water resources and to protect existing rights when river flow falls below a certain threshold, restrictions are put into operation. Winter storage reservoirs are encouraged where practical supplies of water for irrigation. Fish farming can severely affect a watercourse by diverting a large proportion of the flow through the farm, leaving the river reduced in flow. The requirement for an adequate residual flow can restrict the viability of a fish farm.

5.6.2 Local Perspective

Drinking water supply

Severn Trent Water Ltd and Anglian Water Services are the water companies in the area. Most of the water used to supply the area is imported into the area from outside the Soar area. The reason for this importation is due to the fact that although much of the area is covered with impermeable marls and clays there have been few opportunities for reservoir sites due to the relatively flat terrain and low run-off. In addition there are very few aquifer areas within the plan area which are capable of supporting large scale groundwater abstractions. (see Map 5 - Groundwater vulnerability).

The only area where some reservoir development has taken place in the group of impounding reservoirs in Charnwood Forest at Cropston, Swithland, Thornton and Blackbrook. Thornton Reservoir was not in use from the mid 1980s to very recently and the average yield from the other

three reservoirs is of the order of 22 MI/d. The rate is however variable as the reservoirs are relatively small due to a limited catchment area. Thornton Reservoir has been reintroduced to supply. This is done by releasing water down the Rothley Brook and then transferred to Cropston Reservoir, via an abstraction from the Brook at Anstey.

The main supply to the area comes from the River Dove abstraction at Eggington via Melbourne Treatment Works; the average yield is 205 MI/d. Further imported water is pumped into the area, at a rate of approximately 10 MI/d, from the south west, with the source primarily being the River Severn abstraction at Strensham; water is also imported from the Derwent Valley reservoirs (36 MI/d). Currently engineering works are being undertaken to bring in 6 MI/d of Rutland Water to the eastern part of the plan area.

Groundwater abstractions are confined to two Sherwood Sandstone boreholes in the Coalville area, namely Holly Hayes and Broomleys, which have a combined average yield of 2 MI/d. Map 11 and table 6 show the major surface and groundwater abstractions in the plan area.

There are no direct river abstractions in the area for public water supply.

Industry

Licences to satisfy industrial demands are utilised for a number of uses. The greatest usage is by the aggregate quarrying companies who use both surface and occasionally groundwater resources for mineral washing at their quarries. The main centres of activity being the Charnwood Forest area and the low lying areas of the Soar and Wreake valleys. Except for some evaporative loss at the quarries most of the pumped water is returned either to neighbouring watercourses or to underlying strata and therefore does not represent a significant drain on water resources. The only coal mine in the area, at Asfordby, abstracts water from the Soar Valley at Barrow on Soar with the water being piped a great distance back to the mine. Also at Asfordby water is abstracted from the River Wreake for specialised pipe production; nearby at Melton Mowbray water is also taken out of the same river for the large scale production of pet food. In the Leicester area water is abstracted from the River Soar for use in shoe and textile manufacture; some is also used in metal finishing. In Loughborough water is taken from the same river for usage in dye works.

Agriculture

The use of both surface water and groundwater for large scale spray irrigation is very limited throughout the plan area and tends to be confined to the Wreake and Soar Valleys. The irrigated water is used primarily for potatoes, sugar beet and carrots. Nottingham University has

its School of Agriculture at Sutton Bonnington and has a major abstraction from the River Soar.

There are a large number of very small licences which have been issued to cover stock watering and general use around the farm.

Table 6 Surface and groundwater abstractions

Type of Abstraction	Surface Water Abstraction			Groundwater Abstraction		
	No. of Licences	Licensed Abstraction (MI/d)	Percent by volume %	No. of Licences	Licensed Abstraction (MI/d)	Percent by volume %
Public Water Supply	3	40.8	38	2	2.7	18
Private Water Supply	7	0.2	< 1	11	0.1	< 1
Industrial	28	61.2	56	14	10.6	71
Agricultural - spray irrigation	76	3.4	3	28	0.4	3
Agricultural - other than spray irrigation	3	< 1	< 1	219	1.2	8
Others (e.g. power production, fish farms)	7	3.3	3	0	0	0
TOTAL	124	108.9		274	15	

Other Abstractions

There are a number of pools and lakes in the area which have been licenced in order to permit commercial fisheries.

5.7 Domestic and industrial effluent disposal

5.7.1 General

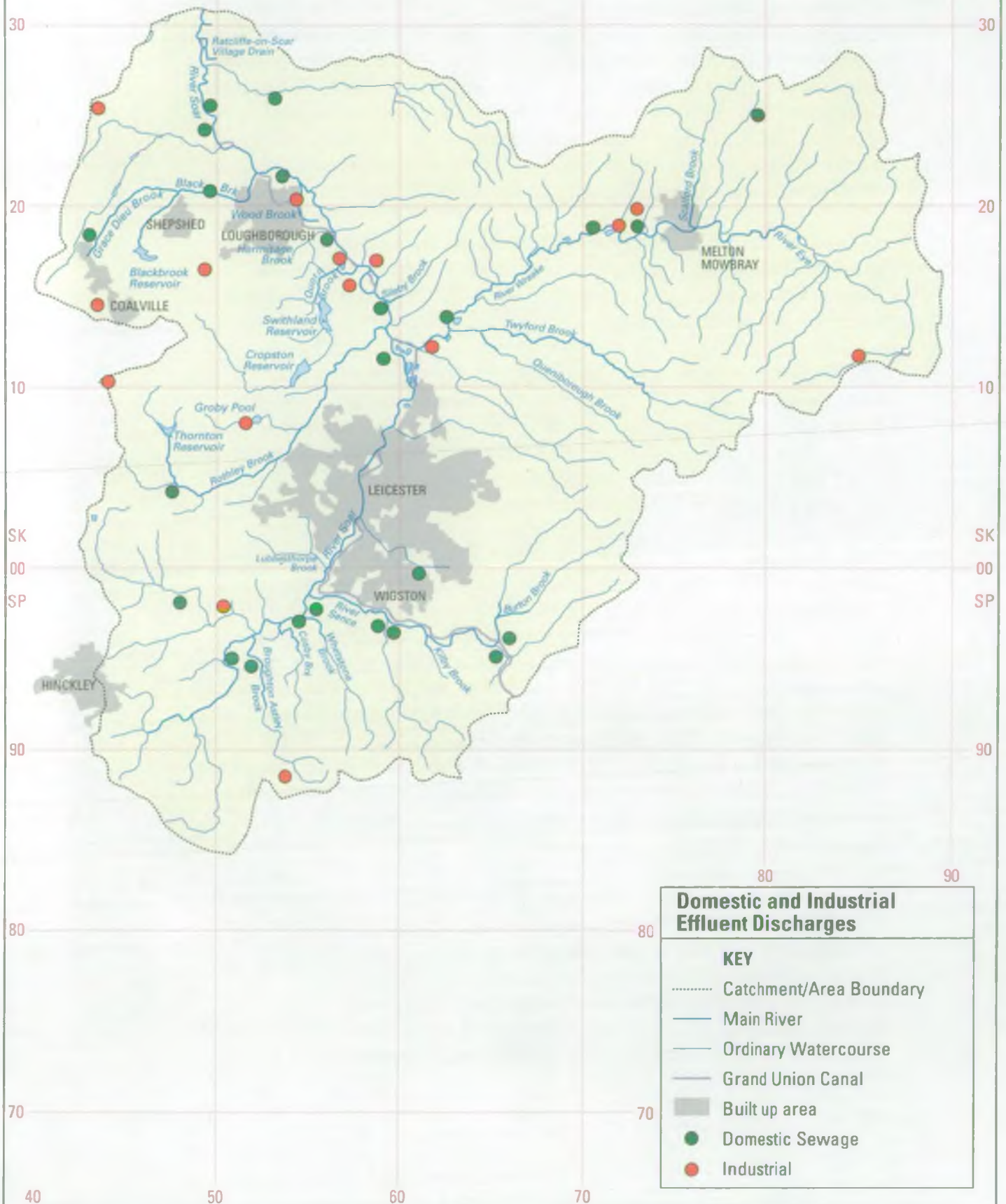
All discharges of sewage and trade or industrial effluent require the consent of the Agency. Such consents specify the volume that may be discharged, along with standards limiting the quality of the effluent.

These conditions are determined taking account of River Quality Objectives (RQOs) and relevant EC Directives to ensure that downstream

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Plan
Map 12**



**ENVIRONMENT
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water quality remains acceptable for its uses.

5.7.2 Local perspective

Domestic sewage disposal

The River Soar at the confluence with the River Trent comprises some 62% treated sewage effluent at dry weather flow (dwf). The quality of sewage effluents discharged therefore has a major influence on the water quality of the river and several of its tributaries. The Thurlaston Brook, River Sence, River Wreake, Wood Brook and Black Brook all receive significant flows of sewage effluent. Major improvements at Melton Mowbray STP, aimed at reducing the ammonia levels discharged by converting the ammonia to nitrate, have brought about improvements in the chemical and biological quality of the River Wreake (see Issue 9).

The recent closure of Anstey and Glenfield STPs, with the diversion of flows to Wanlip STP for treatment has improved the quality of the Rothley Brook. This improvement is set to continue with the planned diversion of the remaining two STPs on the brook.

The discharge of some 23 million litres per day of treated sewage effluent from Loughborough STP completely dominates the quality of Wood Brook below the town. Although the works presently performs well within its consented quality standards, resulting in fair downstream water quality and a healthy fish population, the presence of the STP prevents a long term RQO of better than RE5 (poor) being proposed.

The overriding influence on the water quality of the River Soar below Leicester is the discharge from Wanlip STP serving the city and surrounding areas. Historically, the STP has never fully nitrified all treated flows (converting ammonia to nitrate) and a series of consent modifications has taken place over the last 20 years, requiring increasing proportions of flow to be nitrified as the total works flow has increased due to growth within its catchment area and diversions as outlying works have been closed. The modification in 1995 resulted in STW Ltd appealing to the Secretary of State for the Environment against the newly imposed conditions. In the event, an acceptable outcome was reached under the supervision of a Department of the Environment Planning Inspector and the appeal was resolved.

The presence of combined sewerage systems in many urban areas results in storm sewage overflow discharges. Improvements to the sewerage infrastructure in Leicester and Shepshed in recent years have led to improved water quality on the River Soar and the Black Brook. At Wysall, an inadequate sewerage system results in an unconsented intermittent discharge of untreated sewage to the Kingston Brook. Severn Trent Water Ltd plan to carry out improvements to eliminate this

discharge by 1998.

Due to the underlying Lower Lias Clay over much of the area, the disposal of sewage in unsewered areas can be problematical. A proliferation of unsatisfactory septic tanks cause localised water quality deteriorations and public complaint occur at Zouch. Several other isolated septic tank installations lead to similar problems throughout the plan area. The increasing number of small private STPs being provided to cater for small developments and isolated dwellings in unsewered areas can be a solution, provided that the plants are adequately maintained, which unfortunately is not always the case.

Industrial effluent disposal

Trade effluent discharges occur from a number of industrial sectors in the area (see Map 12). One of the major water quality issues is that of discolouration due to residual dyestuffs derived from the textile dyeing and finishing industry, which has a stronghold in the Leicester area. In all cases, the textile effluents are discharged to foul sewer for treatment in admixture with domestic sewage at STPs operated by Severn Trent Water Ltd. However, some of the dyes in use are not removed by conventional sewage treatment and only at Wanlip have the water company installed any further measures to remove the colour (see Issue 2). Discharges to foul sewer from the engineering industry necessitate the control of toxic metals in several other sewage effluents including Wigston, Wanlip and Loughborough.

The winning of a variety of minerals results in several major effluent discharges, including those from the deep coal mine at Asfordby. Site drainage from both the mine and the spoil tip discharges into the Welby Brook after treatment in settlement facilities. However, the water raised from the mine workings and the coal preparation plant effluent are too saline to discharge either to the brook or to the River Wreake. Instead, a 15 km pipeline, constructed as part of the mine development, conveys this to the River Soar, where it can be discharged with the benefit of greater dilution in the receiving watercourse. Even so, in order to protect the water quality for several licensed abstractions for crop irrigation, control of chloride is necessary and the discharge consent has recently been modified to include chloride concentration and load limits.

There are a number of hard rock, sand and gravel and clay quarries within the plan area (see section 5.4). Most of these discharge quarry water following treatment in settlement facilities. Discharges of effluent from associated building product manufacture have been eliminated following waste minimisation and effluent recycling schemes at Croft and Barrow, whilst at Desford, a company involved in a similar operation is undertaking effluent recycling trials. The Gypsum mine at Barrow also

makes a consented discharge of minewater and site drainage. A brewery at Langham operates a treatment plant to deal with brewing effluent and sewage generated on the site. The treated effluent discharges to the Langham Brook.

At East Midlands Airport, discharges of site drainage are contaminated in winter by chemicals used for the de-icing of aircraft, runways and taxiways. Historically, these materials have caused severe and persistent pollution of the Diseworth and Long Whatton Brooks, with the impact lasting well into summer. Proposals to discharge the contaminated effluents to foul sewer for treatment at Loughborough or Kegworth STPs were abandoned when Severn Trent Water Ltd refused to receive the effluent. Instead, a scheme has now been commissioned, which involves collecting the contaminated runoff in balancing ponds prior to discharging it at a controlled rate via a pumping main to the River Trent, where sufficient dilution is available. Uncontaminated site drainage continues to drain to the Diseworth Brook. The airport has also changed over to more acceptable de-icing materials which are biodegradable. Whilst these do not exhibit toxic effects to aquatic flora and fauna at the concentrations discharged, they do however pose their own problems due to the consumption of dissolved oxygen as they biodegrade in the watercourse. The system has now been in operation for two winters.

5.8 Surface water drainage and flood defences

5.8.1 General

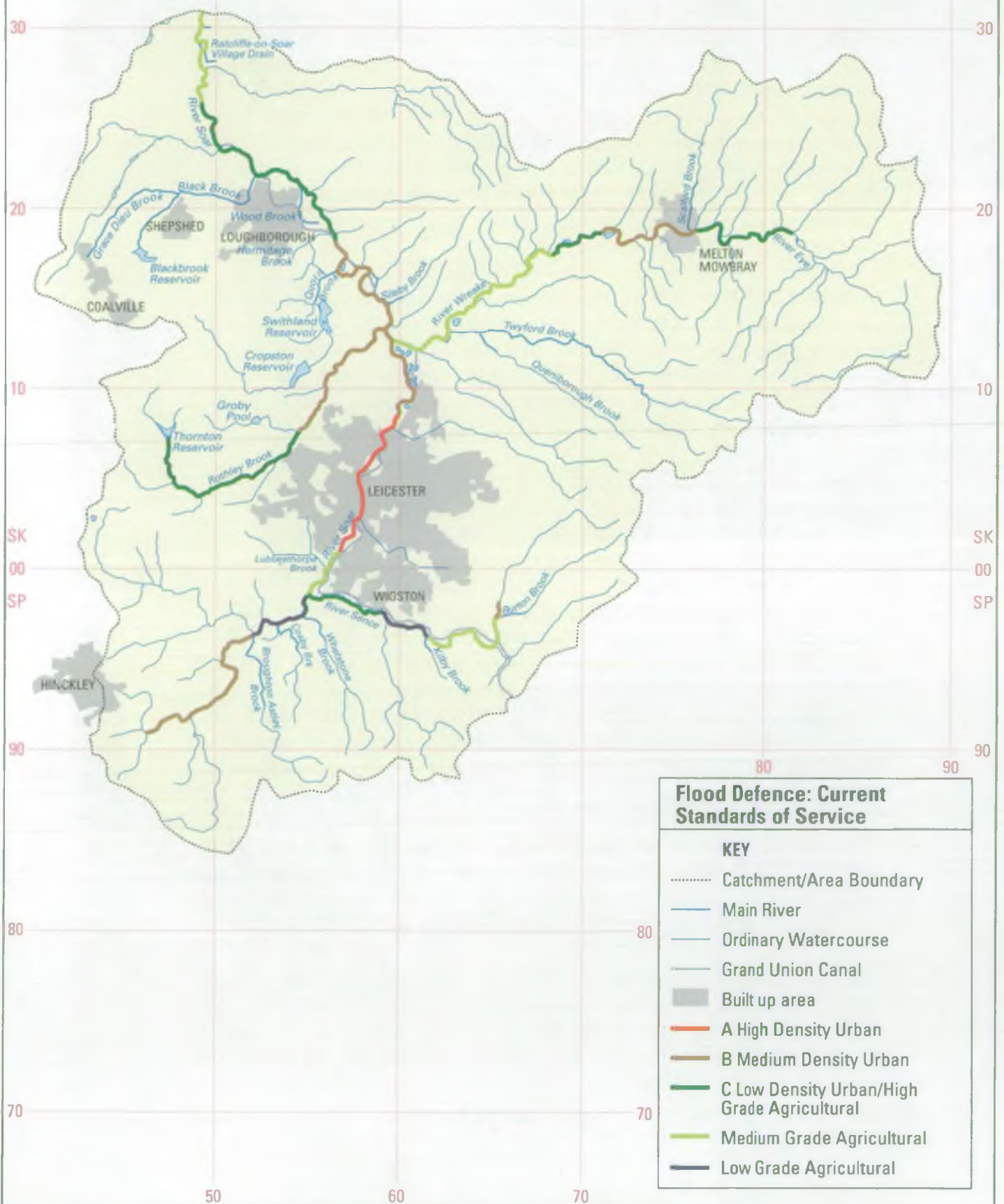
The river network carries surplus water from land to the sea as part of the hydrological cycle. Natural watercourses have limited capacity and when this is exceeded, flooding occurs. Normally flooding is the result of prolonged rainfall or rapid snowmelt. The severity of a flood is generally described in terms of its frequency of occurrence. This is often expressed as a return period in years for example, 1 in 50 years (ie. a flood of this severity would, on average, be expected to occur once in a 50 year period). Flooding is often exacerbated or even caused by poor maintenance of watercourses reducing the flow carrying capacity and blockage of watercourses or structures by debris and/or litter.

Floods flow on to the floodplain, which is as much part of the river as the channel which carries normal flows. These natural floodplains provide "on-line" storage of flood water. If significant areas of the flood plain are embanked, tipped or built upon, the lost storage volume leads to higher river levels elsewhere. For this reason, it is not possible to alleviate flooding in all areas. The Agency normally objects to new development in flood risk areas. Control over the river system in relation to development is achieved through the Town and Country Planning Acts and the Agency acts as a statutory consultee.

Soar
Local Environment Agency
Plan
Map 13



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**Flood Defence: Current
Standards of Service**

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- A High Density Urban
- B Medium Density Urban
- C Low Density Urban/High Grade Agricultural
- Medium Grade Agricultural
- Low Grade Agricultural

Flood defences are designed to protect an area against a flood of a particular return period. Different types of land use (for example urban and rural areas) are protected against different sizes of flood, with the target 'Standard of Service' detailed in Section 5.3 (and Appendix 3, Table 14).

Whilst the responsibility for the maintenance of any watercourse normally rests with the riparian owner (ie: the owner of the river bank and bed), certain reaches of the river are formally designated as "Main River". On Main river, the Agency has permissive powers to construct and maintain defences and to control the actions of others through Byelaws and the issue of Land Drainage Consents. District and County Councils have permissive powers to carry out works on Ordinary Watercourse (ie: those not designated as main river), and to make Byelaws, although this still requires the Agency's consent.

In respect of Flood Defence, the Agency has a supervisory role over all matters relating to watercourses. It has direct powers of control over the construction or alteration of structures in, over, under or within 8 metres of those watercourses classed as main river, and over the construction and alteration of culverts, mill dams, weirs or other like obstructions in any watercourse.

Wider control over the river system in relation to development is achieved through the Town and Country Planning Acts (Section 4.1) and the Agency's role as a statutory consultee.

5.8.2 Local Perspective

The Soar valley has suffered frequent and extensive flooding since the late 18th century. The frequency of flooding and the poor drainage are due in part to the shallow natural gradient of the river and the general clay nature of the plan area but mainly due to the structures constructed to facilitate navigation. A number of flood alleviation schemes have been carried out by the Agency and its predecessors to improve the standard of protection against flooding. The flood defences in the Soar catchment are identified on Map 13, indicating the standard of protection provided.

The Scalford Brook Flood Alleviation scheme was completed in 1991 to help alleviate flooding problems in Melton Mowbray. The surface water runoff from the catchment is retained by an embankment dam and the rate of discharge to the watercourse is controlled by a throttle pipe.

The flood alleviation scheme on the River Wreake incorporated a flood storage system in conjunction with watercourse improvements. At Frisby-on-the-Wreake the former gravel workings have been reinstated as water storage lakes. A control gate diverts the water into the lakes when

the water level in the watercourse reaches a certain depth, providing protection from flooding for flood events with return periods up to 1 in 5 years.

The Soar Valley Improvement Scheme was completed in October 1995, providing 1 in 100 year protection to approximately 600 properties in Thurcaston Road, Leicester, Ratcliffe-on-Soar, Sutton Bonington, Kegworth, Normanton-on-Soar and Quorn. 1 in 10 year protection was also provided to 12 roads across the valley and to 2500 hectares of agricultural land. The works included the construction of 34 km of new flood defences, construction of flow control structures and replacement navigation locks, and regrading and marginal widening of sections of the River Soar.

The flood alleviation scheme on the Twyford Brook at Ashby Folville was completed in December 1995. This involved widening, regrading and realignment of the watercourse, alterations to or replacement of existing structures and construction of a new bypass channel for high flows.

A number of smaller flood alleviation schemes have been carried out on main rivers in the area by the Agency and by private development in order to provide improved protection to properties at risk without adversely affecting others.

In much of the Soar area, surface water balancing is required in order to restrict the increased rate of surface water runoff from new development to the watercourses that are already under capacity. Balancing schemes are generally approved by the Agency, but are constructed by the developer. Maintenance of the balancing ponds is generally undertaken by the owner or user, although the Agency prefers the systems to be adopted and therefore maintained by the Local Authority. A large number of such balancing schemes have been constructed in the plan area.

The Kingston Brook Internal Drainage Board (IDB) lies within the Soar plan area. The IDB has a duty to exercise general supervision over all matters relating to the drainage of the land within their district and has similar permissive powers and environmental and recreational duties as the Agency.

5.9 Waste Management

5.9.1 General

Waste Management involves the reduction, re-use, recovery, treatment and disposal of waste. The Agency promotes the reduction of waste by encouraging industry to use technology which requires less material in products and produces less waste in manufacture. Re-use involves using a product in its existing form, for example, returnable bottles. Recovery

includes recycling, composting and energy generation, with waste as a source of fuel. When it is not viable to apply the previous methods, the waste needs to be disposed of in a way that does not have an adverse environmental impact.

Household, industrial and commercial wastes are disposed of at waste management facilities. With the exception of certain exempt facilities, sites which keep, treat, dispose or deposit wastes must be licensed by the Agency. The exemptions mainly cover re-use and recovery operations. They are exempt from the licencing system so that such operations are encouraged by reducing the legislative burden on them. The exempt facilities still have to register with the Agency.

The location of the waste management facilities is decided through the land use planning system by the LPAs under the Town and Country Planning Act 1990.

Waste minimisation - the concept of sustainability will also have an impact on the future of waste management. The Government's White Paper, "Making Waste Work," published in December 1995, aims to apply the principles of sustainable development to waste management and sets targets for achieving that aim. The White Paper sets out three key objectives for waste management:

- * to reduce the amount of waste that society produces
- * to make best use of the waste that is produced; and
- * to choose waste management practices which minimise the risks of immediate and future environmental pollution and harm to health.

The reduction of waste is achieved by the more efficient use of raw materials and other resources. The more we get out of the resources we use today, the more resources will be left for the future. In addition, the risk of environmental pollution from landfill sites will decrease in the future if more waste is diverted from landfill through waste minimisation, reuse and recycling. The White Paper includes both general targets and targets relating to particular waste streams, (Section 6.1.2). The Agency will play a key role in implementing these objectives.

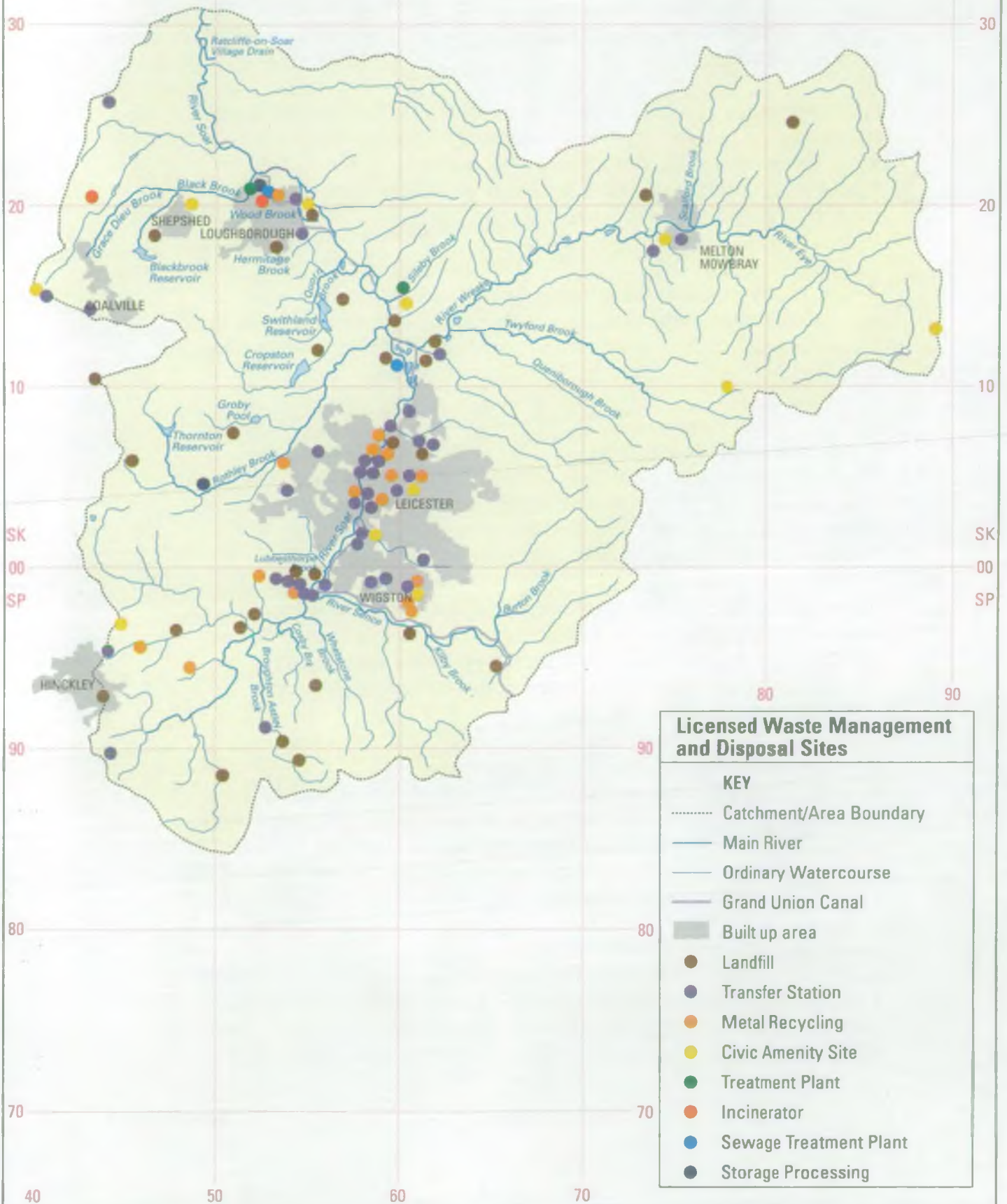
Land Applications of Wastes

The spreading of sewage sludge and industrial wastes on land is a major disposal/recovery route of national importance and a well established method of recycling nutrients to land. Farmers practice land spreading throughout the area and have recognised the benefits of applying animal manures, which contains sewage sludge. Some controlled wastes in liquid or sludge form have similar beneficial effects.

**Soar
Local Environment Agency
Plan
Map 14**



**ENVIRONMENT
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Any person who wishes to spread controlled waste on land without holding a waste management licence needs to inform the Agency of the site location and details of the waste types in advance of any deposit taking place. The details must include an independent expert assessment of the beneficial nature of the wastes to ensure that the disposal is not licensable. It also enables the Agency to carry out an inspection of each specific landspreading activity to ascertain whether any pollution is likely to or has occurred.

Land application of wastes is likely to increase over the next few years due to increasing disposal costs. Consequently effective regulation by the Agency is necessary to ensure that any spreading is for the purpose of benefit to agriculture and that it is carried out without harming the environment.

Unauthorised deposits.

As previously explained waste management facilities require a waste management licence and must operate the facility in accordance with the licence conditions. It is an offence to keep treat or deposit waste without a licence.

5.9.2 Local Perspective Waste Management Facilities

There are 108 licensed waste management facilities in the area, shown on Map 14, of which 28 are licensed landfill sites. Other facilities include Transfer Stations, Metal Recycling Sites and Sewage Treatment Works. There is a clinical waste incinerator at Sutton Bonnington.

There are 3 major landfill sites licensed for household and industrial type wastes. One of these sites is nearing completion, one is in approximately mid life, and the third has several years of planning consent and considerable space remaining. There are no outstanding planning applications for large landfill sites.

Exempt Activities

In 1996/97 there were 32 registered exemptions for metal recycling facilities and 347 registered exemptions for other general exempt facilities in Leicestershire. These other exemptions include recycling banks (eg. paper, cardboard, plastic), oil recycling facilities and the use of waste soil for land reclamation or construction purposes.

Land application of wastes

In 1994/95, 33 prenotifications for landspreading waste were received by Leicestershire waste regulation authority. Twenty five site inspections were made which monitored each of the deposits that took place. Overall this work monitored the landspreading of 42,600 tonnes of controlled

waste consisting of food and drink processing waste (90%), abattoir sludge and biological treatment plant waste.

Unauthorised deposits

Illegal activities are not uncommon and take the form of flytipping waste, operating a site without a licence or not complying with licence conditions. During 1994/5 the waste regulation authority carried out investigations into 96 incidents involving alleged illegal tipping activity in Leicestershire.

Leicestershire Waste Minimisation Initiative.

Nine of the ten companies involved in the Leicestershire Waste Minimisation Initiative are situated within the area. The Initiative carried out a project with these companies to demonstrate how waste minimisation techniques could reduce their operational costs and reduce their waste outputs. After 2 years of implementing waste minimisation projects, the companies made savings totalling £1.3 million. The Agency is continuing to promote waste minimisation to industry as a way to reduce waste and prevent pollution and will initiate further projects in the next year (see Section 4.2.3).

5.10 Contaminated land

5.10.1 General

The Agency is aware of a variety of potentially contaminated sites within the region. These include closed landfills, old gasworks sites and a wide range of industrial sites, many of which are located in environmentally sensitive locations such as near to rivers or on aquifers. Positioning of sites close to water bodies or on aquifers is a historic relic of the need for water in the industrial process, as a method of transport for raw materials and products, and the location of centres of population.

As part of the Agency response to planning applications, we may request that Site Investigation (SI) is undertaken prior to redevelopment and that remedial works are undertaken should the SI indicate that they are required.

Various techniques are available for the clean up of contaminated land. Traditionally, excavation of contaminated material and disposal to a licensed landfill site has been the most commonly chosen method of remediation. The removal of any contaminated materials from a site should only be undertaken by a licensed carrier who follows a 'Duty of Care' under the Environmental Protection Act 1990. The Agency will consider all alternative technologies which are capable of cleaning a site to an acceptable standard. Where these methods represent a better environmental option to the 'dig and dump' option, the Agency will encourage their use.

Where land is not subject to planning application, but is known to be contaminated and is having an impact on the quality of controlled waters, the Agency will encourage the polluter / owner to undertake remedial works. Where pollution has occurred, the Agency encourages operators to inform the Agency, so that agreed remedial action can be taken, based on the environmental risk at the site. Where operators do not inform the Agency and subsequently pollution of controlled waters is detected, prosecution under Section 85 of the Water Resources Act 1991 will be considered or remedial work under Section 161 of the Act will be required.

Existing contaminated land sites offer, once suitably remediated, an opportunity for redevelopment. It is often preferable to redevelop the most sensitive sites with less contaminating end uses which pose a lower threat of pollution to water resources. In many circumstances, however, the Agency would prefer to see existing industrial land stay as industrial rather than see alternative expansion onto uncontaminated green field sites. The Agency would comment on each proposal on a site by site basis.

Of the estimated 100,000 contaminated land sites throughout the UK, many of these sites will require some sort of remediation to make them suitable for a specific use or to eliminate a specific significant hazard to human health, the environment, or buildings. A significant number of these sites are believed to be located in the Midlands Region. Under the Environmental Protection Act 1990 and the Environment Act 1995, the Agency will have the primary responsibility for and a number of duties to manage 'special contaminated land sites'.

The Regulations and Statutory Guidance associated with the above Acts are only in draft form at present. The main responsibility for identifying contaminated land and ensuring its remediation, will be with local authorities. The Agency will have a significant role in providing advice, liaising with and consultation to, Local Authorities carrying out these duties. We will only have the primary role with the 'Special' sites, as defined in the Guidance, which are the most seriously contaminated ones.

The local authorities and the Agency, where appropriate, will have the power to issue 'Remediation Notices', to require adequate clean up of contaminated sites.

The General Development Order 1988 No 1813 (Amended by The GDPO 1995 No 419) requires Local Planning Authorities to consult with the Environment Agency on any planning application for development on or within 250 metres of land which:-

"(1) is or has at any time in the 30 years before the relevant application

been used for the deposit of refuse or waste and

(2) has been notified to the local planning authority by the Waste Regulation Authority for the purposes of this provision"

The Agency is required to notify the Planning Authority of any known former landfill sites.

5.10.2 Local perspective

In many cases little information is available on the state of the contaminated sites. For instance, the former Waste Regulation Authorities did not have powers or duty to investigate within the waste disposal site boundaries. The Agency will have powers in the future, to inspect and under certain circumstances, require remedial action to be taken on such sites which have been notified to us by the Local Authority as a 'Special Site'.

Contaminated land is not a serious problem in this area. Former industrial areas in the main urban areas can be contaminated. Appropriate remedial action where sites are causing problems is required by the Agency, usually during redevelopment.

5.11 Agriculture and forestry

5.11.1 General

During recent decades agricultural practices in the United Kingdom have changed markedly in comparison with the early and middle parts of the century. New technologies and greater consumer demand has lead to the industry becoming increasingly mechanised and intensified which in turn has resulted in increasing pressures on the environment.

In the dairy industry straw based barns have given way to large parlours, producing vast quantities of animal slurry, while silage, with its highly polluting liquor, has replaced straw as the major cattle fodder. In arable farming traditional pest control methods have been succeeded by the widespread use of pesticides and herbicides, presenting new hazards to the aquatic environment.

Given the above, and the fact that over 80% of the land in England and Wales is used for agriculture, it is of little surprise that the industry can have a major impact on water resources and the ecosystems which depend upon them. Increased environmental awareness, both by government bodies and by the farming community itself, has led to better pollution prevention practices and to significant improvements in river quality in many agricultural catchments.

Legislation, grants and the increased availability of specialist advice have

all been important factors in reducing the impact of farming on the environment and the Agency, in conjunction with MAFF and ADAS, will continue to play a central role in this process. Examples of the work involved include:

- * The Agency is responsible for enforcing the Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991, which set down minimum standards for the design and construction of agricultural storage systems. In addition the Agency has a duty to regulate the abstraction of water for agricultural use.
- * The Agency carries out a programme of farm visits both to identify sources of pollution and to offer advice to farmers and works closely with farming groups and organisations.
- * The Agency also promotes initiatives such as MAFF's The Code of Good Agricultural Practice for the Protection of Water and Farm Waste Management Plans.
- * The Agency will assist MAFF to promote conservation through the Farm and Conservation Grant Scheme, the Environmentally Sensitive Areas Scheme, Agri-Environment Scheme and Farm Woodland Premium Scheme. In addition, the Forestry Commission offers a woodland grant scheme, the Countryside Commission offers Countryside Stewardship, the Hedgerows Incentive Scheme and landscape conservation grants. The Agency will assist in the promotion of conservation on farms through adoption of these schemes.

The Agency aims to:

- reduce the impact of agricultural practices on surface and ground waters through a combination of education and enforcement action.
- ensure that future agricultural development is carried out in a way that is sustainable and will not compromise the quality of the environment.

5.11.2 Local Perspective

The dominant land use in the area as shown on Map 15 is agriculture. About 60% of the area is covered by either arable crops or grassland. The most common farm type identified in 1983 was dairying. Since that time, however, cattle and sheep, horticultural and part time holdings have increased, causing a decline in dairy holdings.

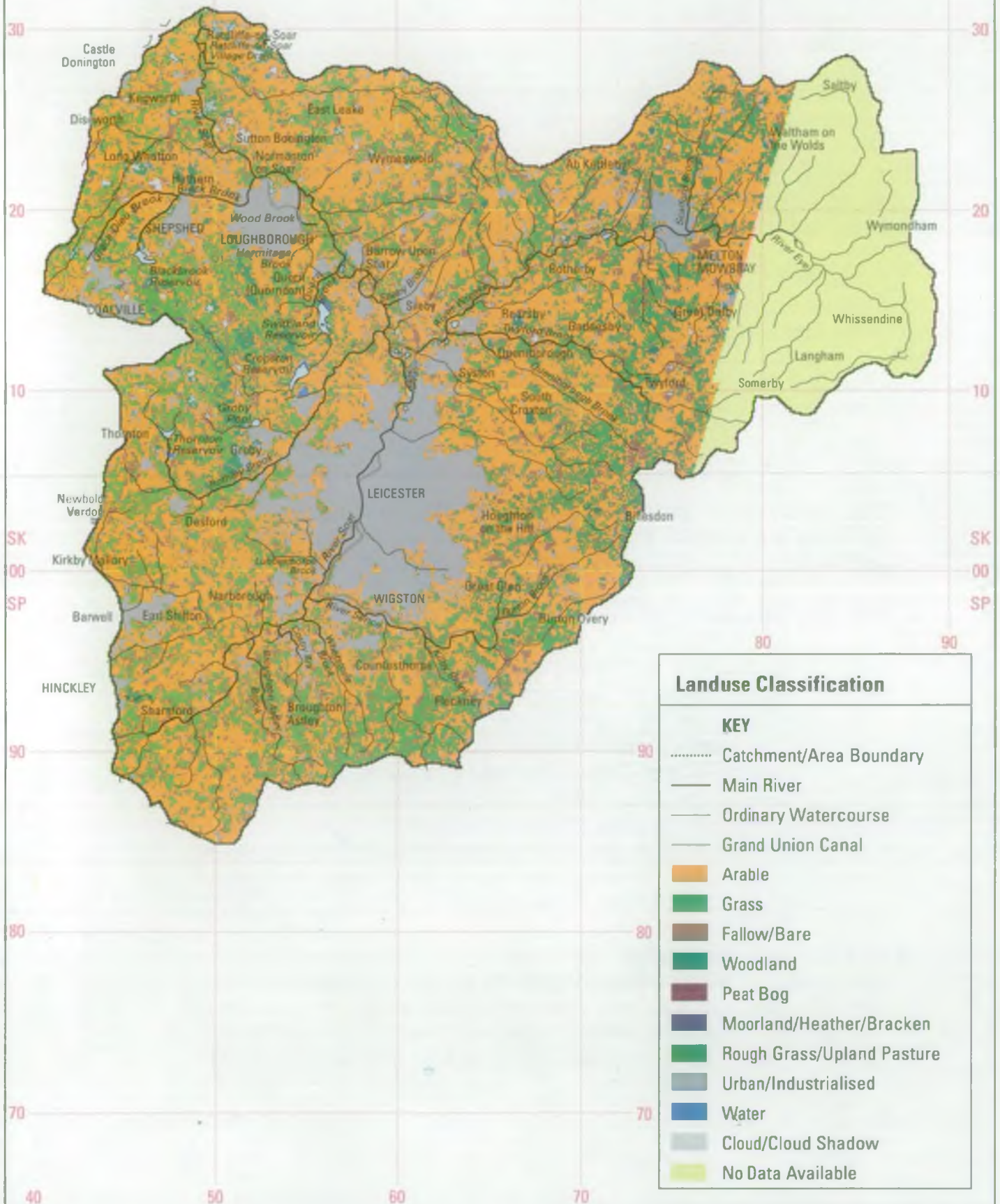
The total area of arable land has also declined due to the introduction of Set-aside, as well as an increase in farm woodland planting.

Over the last decade there has been a marked increase in the number of

**Soar
Local Environment Agency
Plan
Map 15**



**ENVIRONMENT
AGENCY**



Landuse Classification

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Arable
- Grass
- Fallow/Bare
- Woodland
- Peat Bog
- Moorland/Heather/Bracken
- Rough Grass/Upland Pasture
- Urban/Industrialised
- Water
- Cloud/Cloud Shadow
- No Data Available

smaller holdings (of less than 20 hectares in size). The predominant holding size is 20 - 50 hectares.

Land tenure in the area reflects the national situation, with the proportion of rented land having decreased over the last ten years from 43% in 1983, to 38 % in 1993. The rest of the land identified is owner occupied.

Within the area, arable crops are the dominant land use. The last decade has seen a marked increase in the use of combinable break crops, such as oilseed rape, field beans and peas and linseed, with a decline in the area of cereals. A decline in the area planted to potatoes has been mirrored by an equivalent increase in sugar beet. Horticultural crops have declined in both the fruit and more predominantly, the vegetable area.

Cattle numbers over the last decade have shown a fall. The knock on effect in the number of young stock was compensated for by an increase in the beef herd until the recent BSE scare.

Sheep and poultry within the plan area have both shown an increase in recent years.

5.12 Conservation

5.12.1 General

The Agency, whilst carrying out its functions or responding to proposals by others, has a duty to promote and further the conservation of flora and fauna.

This duty includes:

- * the protection and, where appropriate, enhancement of all flora and fauna
- * the protection of areas formally designated as being of particularly high conservation value, including National Nature Reserves and Sites of Special Scientific Interest (SSSIs).
- * the protection of sites which, although valuable in ecological terms, are not formally protected, eg Local Nature Reserves and Prime Sites for Nature Conservation.

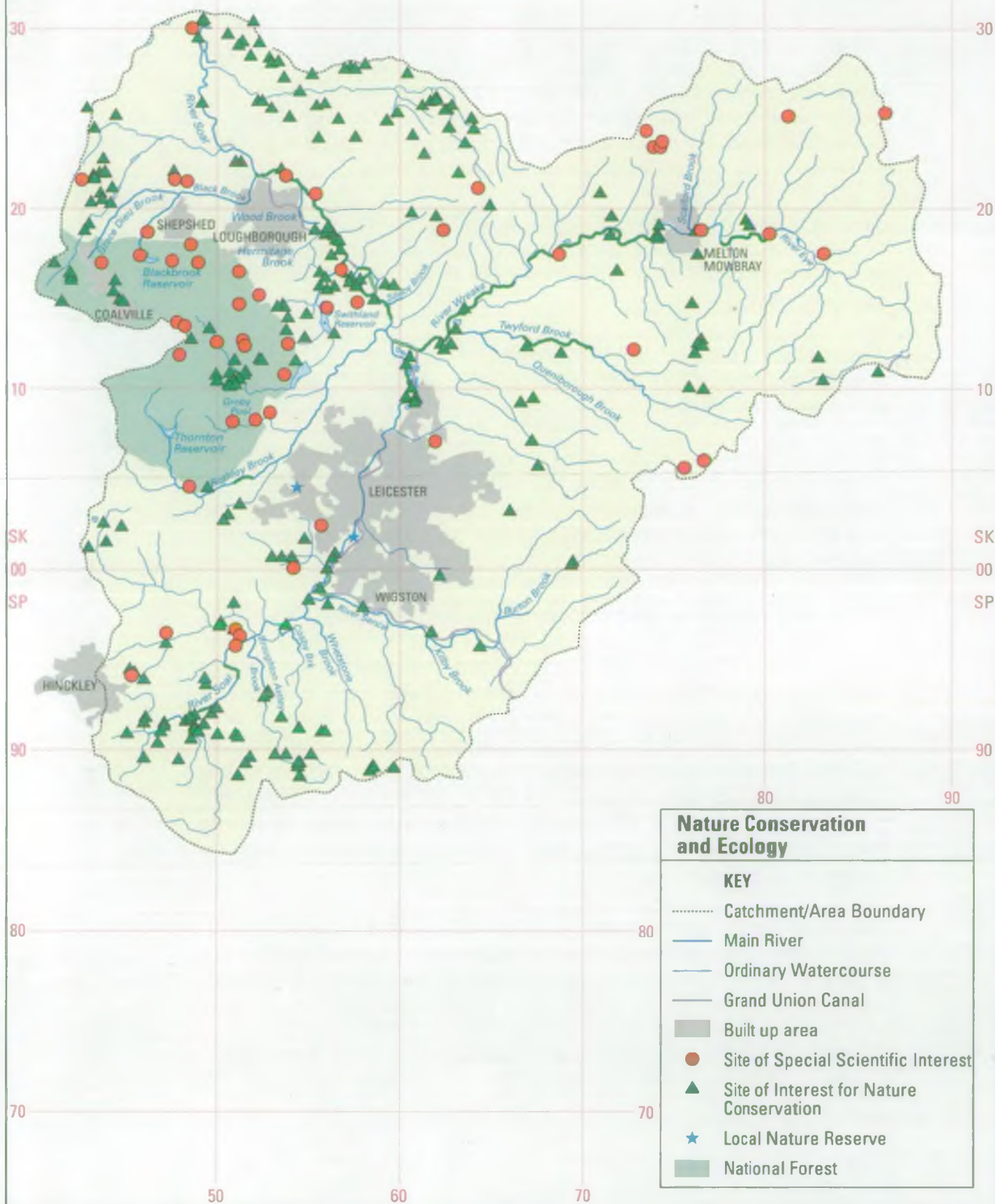
5.12.2 Local Perspective

The ecology of the Soar area is largely the product of management by man. The impact of man has resulted in a significant loss of natural and semi-natural habitats and wildlife. Woodland cover, which would be the natural vegetation of the catchment, has long been reduced to one of the

**Soar
Local Environment Agency
Plan
Map 16**



**ENVIRONMENT
AGENCY**



**Nature Conservation
and Ecology**

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- Site of Special Scientific Interest
- ▲ Site of Interest for Nature Conservation
- ★ Local Nature Reserve
- National Forest

lowest figures in the country. Much of the remaining woodland is to be found in the Charnwood Forest area.

In more recent times, the extent of semi-natural habitats, such as heathland and unimproved grassland, has been drastically reduced. At the same time a large percentage of the area's rivers and streams have been altered for flood defence, land drainage or navigation purposes. This has left a legacy of biologically impoverished watercourses such as the lower reaches of the River Sence to the south of Leicester and the concrete-lined Black Brook where it flows through Loughborough. However, despite the threats and losses significant ecological interest remains in the area. Map 16 shows nature conservation and ecology for the area.

The River Soar is, for most of its length, an above average river in terms of riparian vegetation. There are extensive stands of bulrush, with the attractive purple loosestrife and occasionally flowering rush, arrowhead and yellow water lily.

The water vole can also still be found in parts of the river. This species has shown a major national decline in recent years and is consequently now a protected species.

A string of important wetland Sites of Special Scientific Interest (SSSI) lie alongside the river. These include Croft Pasture, Narborough Bog, Barrow Gravel Pits, Loughborough Meadows and Lockington Marshes. It is important that these sites are sustained by maintaining an adequate water regime.

Further high quality habitats are found in parts of the Rothley and Twyford Brooks. The River Wreake, despite alteration for flood defence and navigation purposes, retains good instream vegetation. Upstream of Melton Mowbray, where this river is known as the River Eye, a truly outstanding diversity of aquatic vegetation is seen in what is one of the few remaining semi-natural channels in the area. The diverse fauna of the river includes the rare Atlantic stream crayfish, our largest indigenous freshwater invertebrate, and the rare white-legged damselfly. However, the section of the river at Hams Bridge is at risk of becoming overgrown due to the topography of the riverbed. A management strategy needs to be drafted for this site.

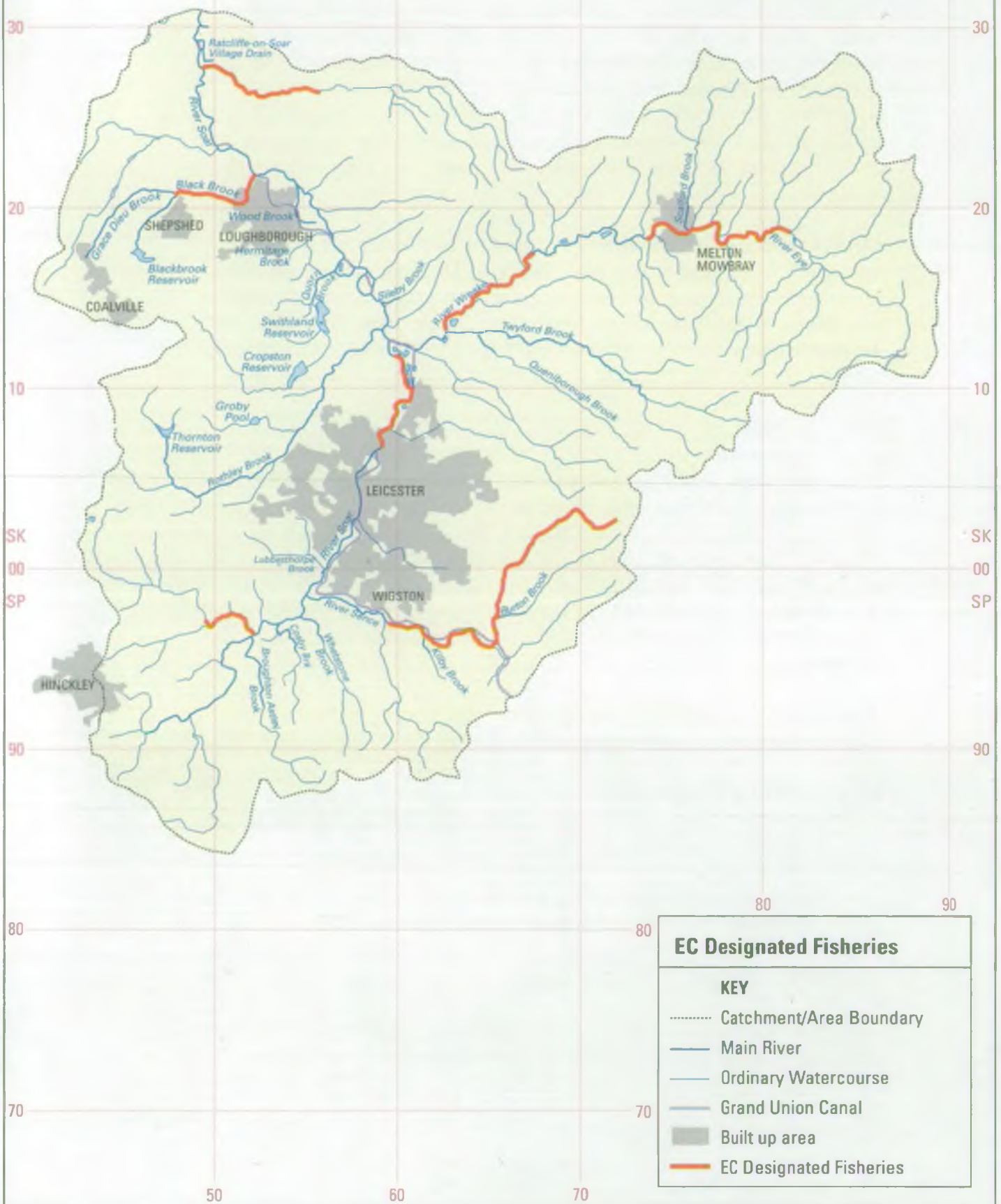
The Charnwood Forest area has an upland feel in contrast to the surrounding countryside and still contains important areas of heathland, ancient woodland, and flower-rich grassland, as found in the Ulverscroft valley.

The upland streams also contrast with much of the lowland River Soar.

**Soar
Local Environment Agency
Plan
Map 17**



**ENVIRONMENT
AGENCY**



EC Designated Fisheries

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- EC Designated Fisheries

The Grace Dieu Brook at Whitwick still retains a natural, largely unmodified structure whilst the upper reaches of the Wood Brook contain the Charnwood caddis fly, found nowhere else in the area. The area is also important for the Atlantic stream crayfish.

The area has little natural open water, the largest natural area of open water being Groby Pool SSSI. However, the creation of reservoirs has vastly increased this. Three major reservoirs, Thornton, Swithland and Cropston are situated in the plan area, together with several smaller examples. These sites contain rare plant species such as shoreweed and mudwort. They also support good populations of wintering and breeding wildfowl, such as teal and shoveler. Swithland and Cropston are both designated as SSSIs.

Gravel extraction has also created important new water-based habitats, especially in the Soar valley to the north of Leicester, within the city's Riverside Park. It is important that gravel restoration schemes maximise the future wildlife potential of such areas. At the same time, there are further initiatives such as the National Forest which touches the western edge of the area (see Map 16) which aim to redress the balance.

5.13 Fisheries

5.13.1 General

The Agency has duties to maintain, improve and develop fisheries. Fish populations are affected by both the quality and quantity of water as well as by the availability of suitable physical habitat features. Fish are therefore important indicators of the overall health of the river.

The Agency is committed to the maintenance of breeding populations of salmonid and cyprinid fish, including the safeguarding of migration between the river and sea.

The Agency has formal responsibility towards angling and issues rod licences that are a legal requirement for fishing for any freshwater fish.

5.13.2 Local Perspective

There are one hundred km of river designated as coarse fisheries by the E.C. Fisheries directive as shown on Map 17.

The Agency is empowered to raise money from anglers by a programme of licensing and much of this is spent on improvement of fisheries by stocking or creating better habitats. Money is also spent on monitoring the health and status of fish populations.

The local fisheries are all rod and line and make up a valuable and much used resource for angling. Major still waters such as Cropston or



Thornton reservoirs are very successful trout fisheries.

Match fishing is of great importance on the main River Soar, the Wreake and the Grand Union Canal as well as a number of small local fisheries.

There are many large gravel pits north of the city of Leicester and in the Wreake Valley. These offer a year round variety of fishing and are abundant in carp, roach, tench and bream and are used extensively for pleasure and match angling.

5.14 Heritage

5.14.1 General

The Agency has a duty to conserve and enhance landscape, archaeological, architectural and historic features which are affected by the operations it consents and licences, or by its own operations.

This duty deals with the protection of areas:

- * formally designated as being of value, eg National Parks, Areas of Outstanding Natural Beauty (AONBs), Scheduled Ancient Monuments (SAM), Listed Buildings, Conservation Areas and Environmentally Sensitive Areas (ESAs)
- * which, although valuable in landscape, archaeological or historical terms are not formally protected, eg sites identified on County Sites and Monuments Records

5.14.2 Local Perspective

The Soar area contains extensive archaeological and heritage interest in the form of cultural and environmental remains. The Agency has a duty to protect this interest.

The River Soar has a high cultural heritage as an ancient waterway, as the old canal bridges and locks bear testament to. Local industry once relied upon the Soar and five canals in the area to transport raw materials and the products of manufacturing. Extensive mill remains, associated with the use of running water for power, occur along the River Soar. These are particularly common in the City of Leicester mill remains also occur frequently on the Wreake and Sence tributaries. The industrial features are comparatively recent in origin.

Rivers have attracted human settlement for thousands of years and this has left a rich cultural heritage. Many Scheduled Ancient Monuments (SAMs) are thus associated with rivers (see Map 18). The City of Leicester grew up around the River Soar, with Leicester Castle SAM standing by the river in the Castle Gardens. Close by, the West Bridge is

the historic entrance to the City, and once the site of an old ford crossing. Elsewhere many other historic sites exist with an association with water. A few examples are the remains of Grace Dieu Priory (SAM) by the Grace Dieu Brook in north-west Leicestershire; the deserted medieval village of Cotes (SAM) by the River Soar at Cotes; and the historic Bradgate Park (including a SAM) associated with the River Lin in Charnwood. Such features often have a high recreational potential which attracts visitors.

Whilst inorganic and organic environmental remains are less visible, and perhaps less spectacular than the cultural remains, they are equally as important. Wetlands and rivers often contain important waterlogged remains which can allow us to recreate the historic conditions and landscape of the past. Thus old peatland sites such as Narborough Bog, of interest in nature conservation terms, are also a valuable record of the past.

5.15 Recreation and navigation

5.15.1 General

The Agency has a duty under the Environment Act 1995 to promote the use of water and land for recreational purposes, consequently the Agency actively encourages recreation on its own sites, where this does not conflict with conservation interests.

The Agency has very few landholdings in this area and therefore promotes recreation by working in partnership with other organisations on other peoples land. Where it does own or lease land, the Agency ensures that such land is made available for recreational purposes, and that the needs of the disabled are taken into account.

This section includes recreational activities that are principally land based but occur within the proximity of the river corridor or wetlands, such as walking and birdwatching. The main issues affecting recreation in the Soar area are access, public safety and the general aesthetic acceptability of the water environment.

The Agency does not encourage swimming in rivers and lakes because of the risk of drowning and the possibility of swimmers catching water borne diseases.

5.15.2 Local Perspective

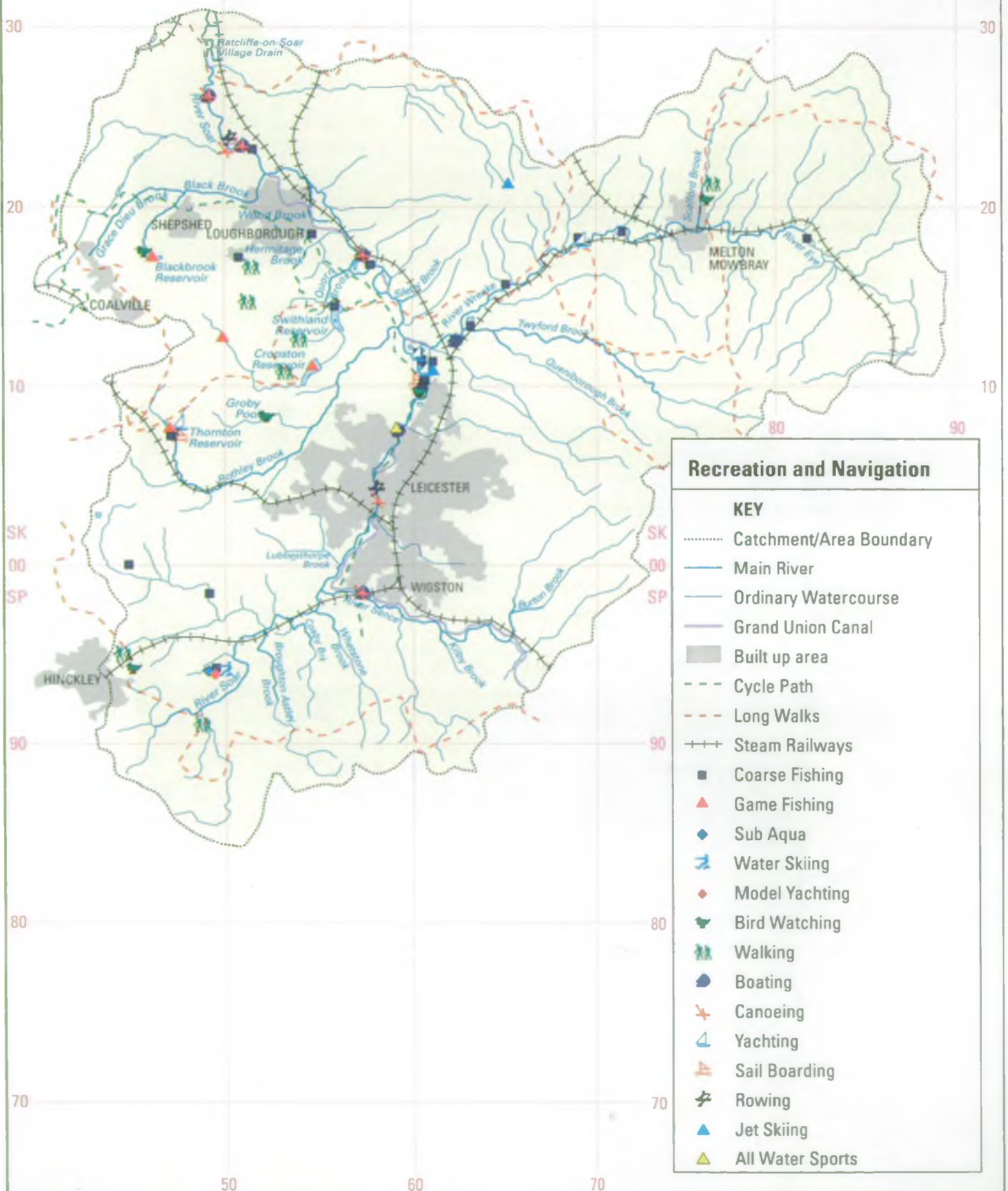
Access and Informal Recreation

The Soar valley is, on the whole, well exploited by recreational interests. In particular, the City Council has designated 12 miles of the river through Leicester as a Riverside Park. The Park is a popular recreational resource and boasts a network of footpaths, cycleways and bridleways.

**Soar
Local Environment Agency
Plan
Map 19**



**ENVIRONMENT
AGENCY**



Recreation and Navigation

KEY

- Catchment/Area Boundary
- Main River
- Ordinary Watercourse
- Grand Union Canal
- Built up area
- - - Cycle Path
- - - Long Walks
- + + + Steam Railways
- Coarse Fishing
- ▲ Game Fishing
- ◆ Sub Aqua
- ⛶ Water Skiing
- ◆ Model Yachting
- 🦉 Bird Watching
- 🚶 Walking
- 🚤 Boating
- 🚣 Canoeing
- 🛶 Yachting
- 🛶 Sail Boarding
- 🚣 Rowing
- 🏂 Jet Skiing
- 🏊 All Water Sports

The Great Central Way is a major cycle route which also follows the Soar valley through Leicester. It forms a part of the Inverness to Dover National Cycle Route promoted by the charity Sustrans. Outside the City, there is scope to promote and improve riverside access which is sometimes fragmented and sometimes under-utilised. However, this needs to be balanced with the needs of nature conservation and other river users. Recreational uses in the plan area are shown on Map 19.

There are many other recreational access areas, including Melton Country Park by the Scalford Brook and Wistow picnic area by the River Sence. The Charnwood Forest area is particularly popular with walkers. Paths occasionally follow or cross one of the many Charnwood streams, such as the River Lin or Quorn Brook.

Birdwatching occurs at Watermead Country Park in Leicester and at the Charnwood reservoirs.

Navigation

The lack of suitable navigable water constrained the economic development of the plan area up until the late Eighteenth and early Nineteenth Centuries when the Rivers Soar and Wreake were made navigable upstream to Leicester and Melton Mowbray respectively. At roughly the same time the Oakham, Charnwood and Grand Union Canals were created.

The Soar Navigation was undertaken in two stages. The first stage, from the Trent to Loughborough was completed in 1778. The second stage from Loughborough to Leicester was completed in 1797. Between the Trent and Leicester the navigation partly follows the line of the River Soar, and partly the line of canal by-pass cuts between river meanders. Finally the Grand Union Canal leaves the River Soar at Aylestone, Leicester to head south and eastwards out of the plan area, following the valley of the River Sence.

Today the Soar and Grand Union Canal are the only navigation system in the area, this being controlled by British Waterways. The navigation is popular with pleasure craft, as well as canoeists and rowers. In some parts of the navigation, notably the lower River Soar, the river is dominated by pleasure boats. Elsewhere, for example in Leicester, there is a lack of moorings and facilities.

Water Sports/Recreational use of Waters

The most popular recreational use of water in the area is angling with most still water and riverine sites providing sport for either coarse or game anglers.

A small number of lakes permit sailing and windsurfing, including Thornton Reservoir, Asfordby Pits and the Watermead Country Park. The latter is also one of the few sites that provides for jet- skiing. Stoney Cove is a well established inland dive site for sub- aqua enthusiasts, but also provides for water- skiing and model yachting. Water sports and recreational use of waters in the area are shown on Map 19.

Section 6 State of the Environment

This section assesses the current state of the plan area, under the headings of land, air and water. This state is then compared with targets, which are the relevant standards considered necessary in order to enable the well being of natural resources, ecosystems and public health to be maintained and where appropriate enhanced. These targets can be local, national or international, statutory or policy based and may be numerical, descriptive or perceptive.

This process identifies shortfalls in targets, when compared to the current state, which is how some of the issues, described in Part 1 Section 3 , were identified.

6.1 Land

- 6.1.1 Waste Management
- 6.1.2 Integrated Pollution Control (IPC)
- 6.1.3 Radio Active Substances (RAS)

6.2 Air

- 6.2.1 Air emissions

6.3 Water

- 6.3.1 Quantity
- 6.3.2 Quality
- 6.3.3 Flood Defence

6.4 Conservation and recreation

- 6.4.1 Conservation
- 6.4.2 Recreation
- 6.4.3 Fisheries

6.1 Land

6.1.1 Waste Management

Targets

The Agency's principal aims for waste regulation are waste prevention and the effective regulation of waste.

Current State

In Leicestershire, the County Council has produced a county wide Waste Disposal (Management) Plan 1996-2006. The Plan considers all the technical issues and concludes by setting strategy objectives which will form a basis for continuing work towards the National Waste Strategy. The Plan was a statutory requirement of Section 50 of the Environmental Protection Act 1990 but this requirement has been repealed by the Environment Act 1995.

The Leicestershire Waste Disposal (Management) Plan is the source of the following facts and statistics on the waste arisings within the Soar Area. Whilst the location of waste management sites can be determined to fall either within or outside of the catchment area, the waste arising statistics cannot be dissected in that way and is only available on a District or County basis at present. Waste is also imported to and exported from the area. Meaningful statistics for these movements are unavailable.

Table 7: Estimated controlled waste arising and disposal within the area.

Waste Category	Waste Arising (Tonnes/Annum)	Waste Recycled (Tonnes/Annum)	Waste Disposal (Tonnes/Annum)
Household and Commercial	235,000	17,000	235,000
Civic Amenity and Commercial	122,000		98,000
Industrial and Commercial	725,000	228,000	478,000
Special	14,000	unknown	7,000
Construction and Demolition	525,000	unknown	451,000
Clinical	4,000	0	1,000
TOTAL	1,625,000	245,000	1,270,000

Household Waste - The Agency applauds Leicester City Council's new initiative to encourage householders to segregate their recyclable waste by providing green bags and a doorstep collection service.

As the main component of household waste is putrescible matter, there is considerable scope for composting. The County Council in Leicestershire and some of the Districts have been responsible for setting up home composting schemes.

Anaerobic digestion offers another means of managing the putrescible waste from

household and industrial sources. The Waste Disposal (Management) Plan for Leicestershire includes a policy for the assessment of anaerobic digestion for potential inclusion as the energy from waste element of the Council's waste management strategy.

Waste Management -Landfill Sites - In order to assist in predicting future requirements for landfill an assessment of remaining and future void capacity is essential. The Leicestershire Waste Disposal (Management) Plan 1996 -2006 contains a debate on the future requirement for landfill space in the area. The actual remaining life of any one landfill will be dependent on a number of factors including:

- * Number of sites competing.
- * Operationing limits set by the licence.
- * The quantity of waste requiring disposal.

With regard to the quantity of waste for disposal, as waste minimisation, reuse and recycling initiatives become established the quantity of waste requiring disposal should decrease. Indeed it is recognised that the current level of landfilling is not sustainable in the long term and there is a finite amount of void space available. However no matter how well developed alternative options for managing waste become, some waste will always need landfilling.

Treatment Facilities - The area has a total of 4 licenced treatment sites. These sites are generally used for the storage of solvents and acids. -No untreated waste- classified as special waste is disposed of from these sites.

6.1.2 Integrated Pollution Control

Targets

The Agency's duty is:

- * In authorising a process we are under a duty to ensure that certain objectives are met, including that the Best Available Techniques Not Entailing Excessive Cost (BATNEEC) are used to prevent, or minimise, the release of substances prescribed under the Environmental Protection Act (EPA) 1990.

Integrated Pollution Control (IPC) is applied to the largest, technically complex and potentially most polluting industrial processes in the area. In authorising a process, the Agency is under a duty to ensure that certain objectives are met, including that the BATNEEC are used to prevent or minimise the release of prescribed processes to land, air or water. In addition, the Best Practicable Environmental Option (BPEO) should be used where the releases from the processes could be more than one of those environmental media (land, air or water). This will aim to ensure that the overall impact on the environment is minimised.

Virtually all the regulated processes under the Environment Protection Act 1990 (EPA) have ongoing improvement programmes. It is through these that the Agency promotes a specific strategy for reducing the impact, or potential impact of the process on the environment. Information concerning these processes is available from the Agency's public register. In addition, there is an annual Chemical Release

Inventory for all IPC sites.

Current state

Within the plan area there are 11 regulated processes. These have been described in Section 5.2 (see table 5 and Map 9). All sites have their own improvement programmes, which they are currently implementing. The Agency collects data on air emissions to assess the impact on air quality of these sites. We are not responsible for the regulation of air quality per se, as this falls to the local authorities, who have wider powers in this respect.

6.1.3 Radio active substances

Targets

The Agency's main aim with respect to radio active substances is to:

- * Minimise radioactive releases to the environment.

This is done by applying a criterion that releases shall be as low as reasonably achievable and ensuring that the best practicable means are implemented to achieve this.

Current state

Within the area, 103 section 7 and 16 section 10 registrations are regulated by the Agency. These include 3 large hospitals in Leicester, 3 main universities and various industrial manufacturing and pharmaceutical research establishments. There are no facilities authorised to incinerate low level radioactive wastes from the establishments mentioned above - this waste is transported by road to sites outside the area which hold authorisations to incinerate the waste. There are no licensed nuclear sites in the area.

6.2 Air

Targets

The Government launched its National Air Quality Strategy in August 1996. This sets out a new set of eight air quality standards which are to be complied with by 2005. The duty for managing air quality improvements is clearly laid upon local authorities and discussions are taking place between the parties as to how these improvements are to be achieved.

The Agency will be assisting local authorities in the development of their action plans to control air quality. Further information on these plans can be obtained from the Environmental Health Departments in the local authorities.

Air emissions

The Agency collects data on air emissions to assess the impact on the environment of the emissions to air from its IPC sites. We are not responsible for the regulation of air quality, as local authorities have wider powers in this respect.

Current State

As part of the Government's National Air Quality Strategy every local authority has to review current air quality and compare this with standards and objectives laid out in the strategy. As part of this requirement the local authorities are also required to provide information on air quality.

The existing European Union Air Quality Standard for nitrogen dioxide is 200mg/m³ (expressed as the 98th percentile) and for sulphur dioxide it is 120mg/m³ (expressed as the median daily value).

The monitoring results for 1994 for Leicester show 17 exceedances of the existing limit for sulphur dioxide and no exceedances for nitrogen dioxide. Monitoring data for the period April 1995 to March 1996 shows that there were no exceedances for either sulphur dioxide or nitrogen dioxide.

The Leicester State of Environment Report has been prepared by the Leicestershire Environment Forum as the first stage in preparing a Local Agenda 21 for the county. The Forum has representatives from business, environmental bodies, academic organisations, public bodies and local groups. Within the report air quality is considered and a number of local issues identified and improvement proposals made.

As a comparison to these EC Air Quality Standards Table 8 below shows the proposed objectives of the Air Quality Strategy.

The Agency must ensure that the operation of all existing and any new processes authorised under Part A (of the Environmental Protection Act 1990) do not result in these air quality objectives being breached.

Table 8 - The proposed objectives of the Air Quality Strategy

Pollutant	Standard		Objective
	Concentration	Measured as	
Benzene	5ppb	running annual mean	to be achieved by 2005
1,3 Butadiene	1ppb	running annual mean	to be achieved by 2005
Carbon Monoxide	10 ppm	running 8 -hour mean	to be achieved by 2005
Lead	0.5mg/m ³	annual mean	to be achieved by 2005
NO ₂	104.6 ppb 20 ppb	1 - hour mean annual mean	104.6 ppb, measured as 99.9th percentile to be achieved by 2005
Ozone	50 ppb	running 8 - hour mean	50 ppb, measured as 97th percentile to be achieved by 2005
PM ₁₀	50mg/m ³	running 24 - hour mean	50 mg/m ³ , measured as 99th percentile to be achieved by 2005
SO ₂	100 ppb	15 minute mean	100 ppb, measured as 99.9th percentile to be achieved by 2005

6.3 Water

6.3.1 Water Quantity

Targets

The Agency's principle aim in relation to water quantity is to:

- * Manage water resources through conservation, redistribution and augmentation of surface and ground water supplies in order to achieve the right balance between the needs of the environment and those of the abstractors.

In groundwater units where resources are available, further licensing of new abstractions is possible, but the objective is to ensure that this is not beyond the sustainable limit.

Current state - surface water

Extensive development of water resources within the area has been restricted primarily due to the relatively flat, slightly undulating topography which is not favourable to the development of large reservoirs.

The majority of water used for public water supply therefore comes from outside the area.

Other water supply demands are met by abstractions from the Soar and Wreake, primarily for spray irrigation, mineral washing and industrial usage.

Current state - groundwater

The geology of the area is dominated by impermeable clays with only very small areas of permeable rocks which form exploitable aquifers, which are shown in table 9 below.

Groundwater resource development is restricted to two public water supply boreholes located in the western part of the plan area in the Coalville area. However due to the fragmented and limited nature of the underlying Sherwood Sandstones, there is no potential for any large scale development. Elsewhere in the area, groundwater resources associated with the sand and gravel deposits in the Soar and Wreake valleys have been partially developed for agriculture and small industrial usage.

Table 9 - Groundwater units and classifications

Unit Number	Unit Name	Category
F01	Diseworth	D
F01	Coalville (part in area)	D

Category A: No Resource available

Category B: Special study needed; presumption against large licences

Category C: Special study - no presumption

Category D: Resources available

6.3.2 Water Quality

Targets

The Agency's principal aim for water quality is:

- * To achieve a continuing overall improvement in the quality of rivers, estuaries and coastal waters through the prevention and control of pollution. In achieving this we aim to ensure that the polluter pays principle is upheld.

River Quality Objectives

The Agency has strategic targets for all significant rivers known as River Quality Objectives (RQOs). These objectives provide a basis for water quality management decisions and are based on a classification scheme known as the Rivers Ecosystem (RE) classification. The RE scheme comprises five quality classes which reflect the chemical quality requirement of different types of river ecosystems.

Table 10 describes the Water Quality Criteria of the RE Classification.

TABLE 10 - River Ecosystem classification : water quality criteria

Class	Dissolved Oxygen % saturation 10 %ile	BOD (ATU) mg/l 90 %ile	Total Ammonia mg N/l 90 %ile	Un-ionised Ammonia mg N/l 95 %ile	pH lower limit as 5 %ile; upper limit as 95 %ile	Hardness mg/l Ca CO ₃	Dissolved Copper µg/l 95 %ile	Total Zinc µg/l 95%ile
RE1	80	2.5	0.25	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5	-	6.0 - 9.0	≤10 >10 and ≤50 >50 and ≤100 >100	5 22 40 112	300 700 1000 2000
RE5	20	15.0	9.0	-	-	-	-	-

Class RE 1: Water of very good quality (suitable for all fish species).
 Class RE 2: Water of good quality (suitable for all fish species).
 Class RE 3: Water of fair quality (suitable for high class coarse fish populations).

Class RE 4:	Water of fair quality (suitable for coarse fish populations).
Class RE 5:	Water of poor quality (which is likely to limit coarse fish populations).
Unclassified:	Water of bad quality (in which fish are unlikely to be present), <u>or</u> insufficient data available by which to classify water quality.

For each designated stretch of water medium and long term RE Class targets are proposed. The medium term objectives are designed to be realistic and achievable and include a date by which the target water quality should be met. Where work is planned in the area to improve water quality, the date assigned to the medium term objective reflects the date by which the improvements should have taken place. Long term targets are set for planning the maintenance and improvement of water quality.

Ultimately, the RE targets may be given a statutory footing by the setting of Statutory Water Quality Objectives (SWQOs) by the Secretary of State. The Agency would be required, as far as practicable, to ensure that such targets were met. A pilot scheme is currently in progress on the Worcestershire Stour to test the operation of SWQOs.

RQOs are established for stretches of river defined according to their upstream and downstream limits. Physical features such as tributaries, weirs, or significant discharges often mark the ends of river stretches since they could potentially affect the quality of the classified watercourse.

Details of the RQOs assigned to river stretches along with compliance and the monitoring data upon which compliance is assessed, are included on the Public Register, information on which can be obtained from the Area Office.

Some consents for water company STPs are based on historical needs and performance rather than target river quality targets. Improvements in effluent quality are needed to meet these targets and one of the roles of the Agency, in conjunction with the DoE, is to negotiate future investment by the water companies. Asset Management Plans (AMP) are produced which specify the improvement work programmed for the period of the plan. The second stage of these plans (AMP2) was agreed in 1994 and it is this plan that governs the priorities for investment for the period covered by the Soar LEAP.

Current state

Table 11 details the stretches of water covered by this LEAP, together with the RE targets assigned to them. For each stretch, three RE designations are given:

The actual quality of the river over the last three years (1993 - 95) in terms of an RE class as shown in Table 11.

Where the current quality is less than the desired medium or long term quality, action is required by the Agency, either to investigate the causes of the problem or to assess the need for investment to be programmed in future AMPs. (See issue 12)

Medium Term Objectives: targets which should be met within the five year period of the LEAP. This objective assumes that all consented discharges in each river stretch discharge to the limit of their consents both in terms of quality and volume.

In practice, the majority of STPs discharge effluents well within their consent limits and as a result, the Medium Term Objective for a river can actually be worse than the Current Quality RE class. Such cases highlight rivers which are not adequately protected and require further investment to ensure that Long Term Objectives are met.

Long Term Objectives: this refers to the quality target beyond the period of the plan. The Agency is committed to reaching or maintaining these targets.

Stretches which significantly fail to meet their RE class are discussed as issues in section 3. At present there are no stretches in the plan area which significantly fail to meet their RE objectives. Map 20 represents how the current water quality of the plan area compares with the long term RE targets. Three categories are shown, Compliant, marginal failure and significant failure. The Long Term Objectives for watercourses are shown in brackets where they are different from the Medium Term Objectives.

TABLE 11 - River Ecosystem class objectives

Watercourse	Stretch Details	Reach (KM)	River Quality Objectives				Biological GQA Class
			Current Quality	Medium Term Objective	Long Term Objective	Compliance	1995
SOAR	CLAYBROOK MAGNA TO CONF. SOAR BK	4	RE2	RE3 (1996)	RE3	C	C
	CONF. SOAR BK TO STONEY STANTON STP	5.8	RE2	RE2 (1996)	RE2	C	B
	STONEY STANTON STP TO THURLASTON BK	2.7	RE2	RE3 (1996)	RE3	C	B
	THURLASTON BK TO CONF. WHETSTONE BK	3.5	RE2	RE3 (1996)	RE3	C	C
	WHETSTONE BK TO CONF. R SENCE	1.2	RE2	RE3 (1996)	RE3	C	C
	CONF. R SENCE TO GRAND UNION CANAL	3	RE2	RE4 (1996)	RE3	C	C
	GRAND UNION CANAL TO FB AT BELGRAVE	10	RE3	RE3 (1996)	RE3	C	D
	FB AT BELGRAVE TO CONF. MELTON BK	1.5	RE2	RE3 (1996)	RE3	C	C
	CONF. MELTON BK TO WANLIP STP OUTFALL	6.5	RE3	RE3 (1996)	RE3	C	C
	WANLIP STP OUTFALL TO B6046 BR, BARROW	9	RE4	RE4 (1996)	RE4	C	C
	B6046 BK BARROW TO CONF. WOOD BK	11	RE2	RE3 (1996)	RE3	C	C
	CONF. WOOD BK TO CONF. LONG WHATTON BK	3	RE2	RE3 (1996)	RE3	C	C
	CONF. LONG WHATTON BK TO CONF. R TRENT	21.3	RE1	RE3 (1996)	RE3	C	C
SOAR BROOK	BURBAGE TO CONF. R SOAR	6.9	RE2	RE3 (1996)	RE3	C	C
BROUGHTON ASTLEY BK	BROUGHTON ASTLEY STP TO CONF. R SOAR	2.3	RE3	RE4 (2001)	RE4	C	C
THURLASTON BK	CONF. NORMANTON BK TO CONF. R SOAR	4	RE2	RE3 (1996)	RE3	C	B
NORMANTON BK	NEWBOLD VERDON STW TO NORMANTON PK BR	12	RE2	RE4 (1996)	RE4	C	C
	NORMANTON PK BR TO THURLASTON BK	2	RE2	RE2 (1996)	RE2	C	B
EARL SHILTON BK	EARL SHILTON STP TO THURLASTON BK	1.6	RE3	RE4 (1996)	RE4	C	E
ENDERBY BK	ENDERBY STP TO CONF. R SOAR	1.5	RE2	RE3 (1996)	RE3	C	C
WHETSTONE BK	NARBOROUGH STP TO CONF. R SOAR	0.5	RE2	RE4 (1996)	RE4	C	C
SENCE	BILLEDON BR TO RD BR. NR GAULBY	3.5	RE2	RE3 (1996)	RE3	C	D
	RD BR, GAULBY TO CONF. BURTON BK	8.5	RE2	RE3 (1996)	RE3	C	B
	BURTON BK TO WAIN BR. N HARCOURT	4.5	RE2	RE3 (1996)	RE3	C	C
	WAIN BR NEWTON HARCOURT TO WIGSTON STP	8	RE2	RE3 (1996)	RE3	C	C
	WIGSTON STP OUTFALL TO FORD AT BLABY	3	RE3	RE5 (1996)	RE4	C	D
	FORD AT BLABY TO CONF. R SOAR	2.5	RE3	RE5 (1996)	RE4	C	D
BURTON BK	GAULBY STP OUTFALL TO GREAT GLEN	4.6	RE1	RE2(1996)	RE2	C	B
	GREAT GLEN TO CONF. R SENCE	0.8	RE4	RE4 (1996)	RE4	C	C
FLECKNEY BROOK	FLECKNEY STP OUTFALL TO CONF. R SENCE	1.5	RE4	RE5 (1996)	RE4	M	D
COUNTSTHORPE BK	ARNESBY STP TO CONF PEATLING PARVA	1.5	RE2	RE4 (1996)	RE4	C	B
	PEATLING PARVA TO COUNTSTHORPE STP	5	RE1	RE2 (1996)	RE2	C	C
	COUNTSTHORPE STP TO CONF. R SENCE	0.5	RE2	RE4 (1996)	RE3	C	C
LUBBETHORPE BK	TRIB. BRAUNSTONE TO CONF. R SOAR	1.2	RE2	RE3 (1996)	RE3	C	D
WASH BROOK	OADBY STP OUTFALL TO CULVERT EXIT, A50	2.5	RE3	RE5 (1996)	RE4	C	D
	CULVERT EXIT NR. A50 TO CONF. R SOAR	2	RE4	RE5 (1996)	RE4	C	D
WILLOW BROOK	HOUGHTON STW TO HUMBERSTONE FB	4.8	RE2	RE2 (1996)	RE2	C	C
	HUMBERSTONE FB TO CONF. LEICS CANAL	11.2	RE3	RE4 (1996)	RE4	C	D

Watercourse	Stretch Details	Reach (KM)	River Quality Objectives				Biological GQA Class
			Current Quality	Medium Term Objective	Long Term Objective	Compliance	1995
EVINGTON BK	STOUGHTON STP TO CONF. WILLOW BK	5.5	RE2	RE3 (1996)	RE3	C	D
MELTON BROOK	FB AT KEYHAM TO TRIB FROM SCRAPTOFT	3.8	RE2	RE2 (1996)	RE2	M	C
	TRIB. FROM SCRAPTOFT TO CONF. R SOAR	4.8	RE4	RE3 (1996)	RE4	C	D
EYE	FORD AT COSTON TO GARTHORPE RD BRIDGE	2	RE1	RE2 (1996)	RE2	C	B
	GARTHORPE RD BRIDGE TO CONF. LANGHAM BK	3.7	RE2	RE2 (1996)	RE2	C	B
	CONF. LANGHAM BK TO TRIB. FROM FREEBY	1	RE2	RE2 (1996)	RE2	C	B
	CONF. TRIB FROM FREEBY TO SCALFORD BK	7	RE2	RE2 (1996)	RE2	C	B
WREAKE	CONF. SCALFORD BK TO MELTON MOWBRAY STP	2.5	RE2	RE3 (1996)	RE3	C	B
	MELTON MOWBRAY STP TO CONF. WELBY BK	3.5	RE2	RE4 (1996)	RE3	C	C
	CONF. WELBY BK TO ASFORDBY STP OUTFALL	2	RE2	RE3 (1996)	RE3	C	C
	ASFORDBY STP TO FB NR GABLES FM HOBY	4.5	RE2	RE3 (1996)	RE3	C	C
	FB NR GABLES FM TO QUENIBOROUGH BK	8	RE2	RE3 (1996)	RE3	C	B
	CONF. QUENIBOROUGH BK TO CONF. R SOAR	4	RE3	RE3 (1996)	RE3	C	B
LANGHAM BK	A606 RD BR LANGHAM TO LANGHAM STP	1	RE2	RE3 (1996)	RE3	C	C
	LANGHAM STP OUTFALL TO CONF. ASHWELL BK	7	RE2	RE4 (1996)	RE4	C	C
	CONF. ASHWELL BK TO CONF. R EYE	8.2	RE1	RE2 (1996)	RE2	C	B
ASHWELL BROOK	RD BR AT ASHWELL TO CONF. LANGHAM BK	1.1	RE2	RE3 (1996)	RE3	C	C
WHISSENDINE BK	COLD OVERTON STW TO DS COLD OVERTON	1	RE2	RE3 (1996)	RE3	C	C
	DS COLD OVERTON TO CONF. LANGHAM BK	7	RE2	RE2 (1996)	RE2	C	C
PICKWELL BK	PICKWELL STP TO CONF. WEST ARM	1.8	RE2	RE4 (1996)	RE4	C	D
	FB. SOMERBY TO CONF. EAST ARM	2.8	RE1	RE3 (1996)	RE3	C	D
	CONF. OF E & W TRIBS TO CONF. LANGHAM BK	6	RE1	RE2 (1996)	RE2	C	C
WYMONDHAM BK	WYMONDHAM STP TO CONF. LANGHAM BK	3	RE2	RE2 (1996)	RE2	M	B
BURTON BK	BURTON BRIDGE TO BURTON LAZARS STP	1.7	RE2	RE2 (1996)	RE2	M	C
	BURTON LAZARS STP TO CONF. R EYE	0.5	RE2	RE4 (1996)	RE4	C	C
THORPE BK	WALTHAM STP TO FB NR GOLDSMITH GRANGE	3	RE2	RE2 (1996)	RE2	C	C
	FB NR GOLDSMITH GRANGE TO CONF. R EYE	5	RE1	RE2 (1996)	RE2	C	C
SCALFORD BK	SCALFORD STW OUTFALL TO CONF. R EYE	6	RE2	RE2 (1996)	RE2	C	C
QUENIBOROUGH BK	CONF. GADDESBY BK TO QUENIBOROUGH STP	1.1	RE2	RE2 (1996)	RE2	C	C
	QUENIBOROUGH STP TO CONF. R WREAKE	0.9	RE4	RE3 (1996)	RE3	C	C
GADDESBY BK	OWSTON STP TO CONF. BURROUGH TRIB.	4.2	RE2	RE3 (1996)	RE3	C	B
	CONF. BURROUGH TRIB. TO GADDESBY TRIB	4	RE2	RE2 (1996)	RE2	C	D
	GADDESBY TRIB. TO CONF. QUENIBOROUGH BK	6.9	RE2	RE2 (1996)	RE2	C	D
TRIB. OF GADDESBY BK	BURROUGH ON THE HILL STP TO GADDESBY BK	1.3	RE1	RE3 (1996)	RE3	C	C
TRIB2 OF GADDESBY BK	THORPE SATCHVILLE STP TO GADDESBY BK	3	RE2	RE3 (1996)	RE3	C	C

Watercourse	Stretch Details	Reach (KM)	Quality Objectives				Biological GQA Class
			Current Quality	Medium Term Objective	Long Term Objective	Compliance	1995
SYSTON BK	HUNGARTON STP TO CONF. MINOR TRIB. BEEBY	4.2	RE2	RE2 (1996)	RE2	M	C
	TRIB. BEEBY TO CONF. R WREAKE	8	RE2	RE2 (1996)	RE2	C	D
ROTHLEY BK	THORNTON BAGWORTH STP TO THORNTON BK	1.8	RE2	RE4 (1996)	RE4	C	C
	CONF. THORNTON BK TO TRIB. FROM DESFORD	4	RE2	RE3 (1996)	RE3	C	C
	TRIB. FROM DESFORD TO M1 RD BR. RATBY	3.9	RE2	RE4 (1996)	RE3	C	C
	M1 RD BR RATBY TO MINOR RD BR ANSTEY	5.2	RE2	RE3 (1996)	RE3	C	C
	MINOR RD BRIDGE ANSTEY TO CONF. R SOAR	8.4	RE2	RE2 (1996)	RE2	C	B
MARKFIELD BK	THORNTON RES. TO CONF. ROTHLEY BK	1.8	RE1	RE2 (1996)	RE2	C	C
QUORN BROOK	RAILWAY BR WOODHOUSE TO CONF. R SOAR	2.7	RE2	RE2 (1996)	RE2	M	D
SWITHLAND BK	ROECLIFFE HILL TO CONF. QUORN BK	6	RE1	RE2 (1996)	RE2	M	A
BRADGATE BK	B591 ULVERSCROFT TO SWITHLAND RES.	11.8	RE1	RE2 (1996)	RE2	C	A
WALTON BK	BURTON ON THE WOLDS STP TO CONF. R SOAR	3.5	RE2	RE4 (1996)	RE4	C	C
HOTON BROOK	HOTON STW OUTFALL TO CONF. R SOAR	2.8	RE2	RE4 (1996)	RE4	C	D
WOOD BK	A6004 RD CULVERT TO LOUGHBOROUGH STP	1.2	RE3	RE5 (1996)	RE5	C	D
	LOUGHBOROUGH STP TO CONF. R SOAR	1.5	RE3	RE5 (1996)	RE5	C	B
BLACK BROOK	B5350 RD BR CHARLEY TO BLACKBROOK RES.	4.3	RE2	RE2 (1996)	RE2	C	A
	BLACKBROOK RES. TO GRACE DIEU BROOK	5.2	RE1	RE3 (1996)	RE3	C	A
	CONF. GRACE DIEU BROOK TO CONF. R SOAR	5.9	RE3	RE4 (1996)	RE4	C	C
GRACE DIEU BK	DISUSED BR GRACE PRIORY TO SNARROWS STP	0.5	RE2	RE3 (1996)	RE3	C	B
	SNARROWS STP TO FOREST LANE BELTON	2.5	RE3	RE5 (1996)	RE4	C	E
	FOREST LAND BELTON TO CONF. BLACK BK	3.3	RE3	RE4 (1996)	RE4	C	E
LONG WHATTON BK	CONF. WESTMEADOW BK TO LONG WHATTON STP	2.4	RE2	RE2 (1996)	RE2	M	C
	LONG WHATTON STP TO CONF. R SOAR	1.6	RE4	RE5 (1996)	RE4	M	D
WESTMEADOW BK	FB AT THRINGSTONE TO LONG WHATTON BK	8.9	RE1	RE2 (1996)	RE2	C	B
KINGSTON BK	FB ABOVE WYALL TO STONE BR EAST LEAKE	7.7	RE2	RE2 (1996)	RE2	C	C
	STONE BR E LEAKE TO RD BR WEST LEAKE	3.5	RE2	RE3 (1996)	RE3	C	C
	MINOR RD BR WEST LEAKE TO CONF. R SOAR	4	RE3	RE3 (1996)	RE3	M	C
HEMINGTON BK	FOOTBRIDGE TO CONF. R SOAR	1.8	RE3	RE3 (1996)	RE3	C	C

CANALS

GRAND UNION	CONFLUENCE R SOAR, ZOUCHE TO R SOAR	0.8	RE2	RE3 (1996)	RE3	C	O
	BISHOPS MEADOW TO PILLINGS LOCK	6.6	RE3	RE4 (1996)	RE4	C	O
	R WREAKE TO SOAR, THURMASTON NORTH	2.3	RE2	RE3 (1996)	RE3	C	C
	FOOTBRIDGE AT BELGRAVE TO HITCHCOCK'S WEIR	2.1	RE4	RE4 (1996)	RE4	C	D
	HITCHCOCK'S WEIR TO UPPERTON RD BRIDGE	2.6	No Data	-	RE4	No Data	C
	KING'S LOCK TO WISTOW HALL, FLECKNEY	13.6	RE2	RE2 (1996)	RE2	C	O

KEY:

FB Footbridge
 CONF Confluence
 BK Brook
 RD BR Road bridge
 STP Sewage Treatment Plant
 R River



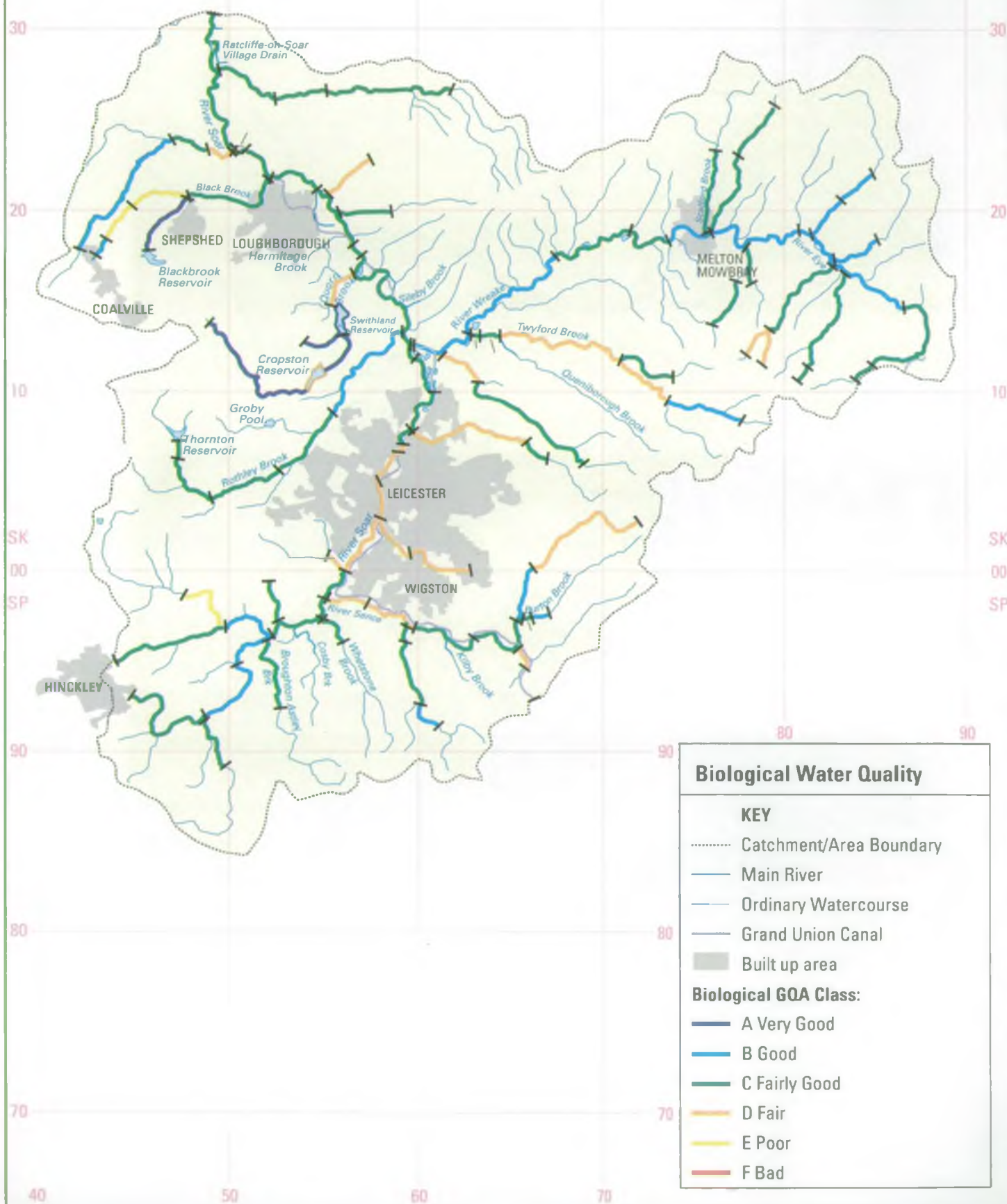
----- Catchment/Area Boundary
 — Main River
 — Ordinary Watercourse
 — Grand Union Canal
 ■ Built up area
 ■ Compliant
 ■ Marginal Failure
 ■ Significant Failure
 — No Data

RE4 (RE3) **Medium Term Objective**
(With Long Term Objective in Brackets
where Different)

**Soar
Local Environment Agency
Plan
Map 21**



**ENVIRONMENT
AGENCY**



EC Directive Reporting

EC Directives apply to the quality of surface water for potable (drinking)water abstraction, to support fish life and to control the discharges of dangerous substances. Relevant directives are listed in Appendix 5.

6.3.3 Flood defences

Targets

The Agency's principal aims in relation to flood defence are to:

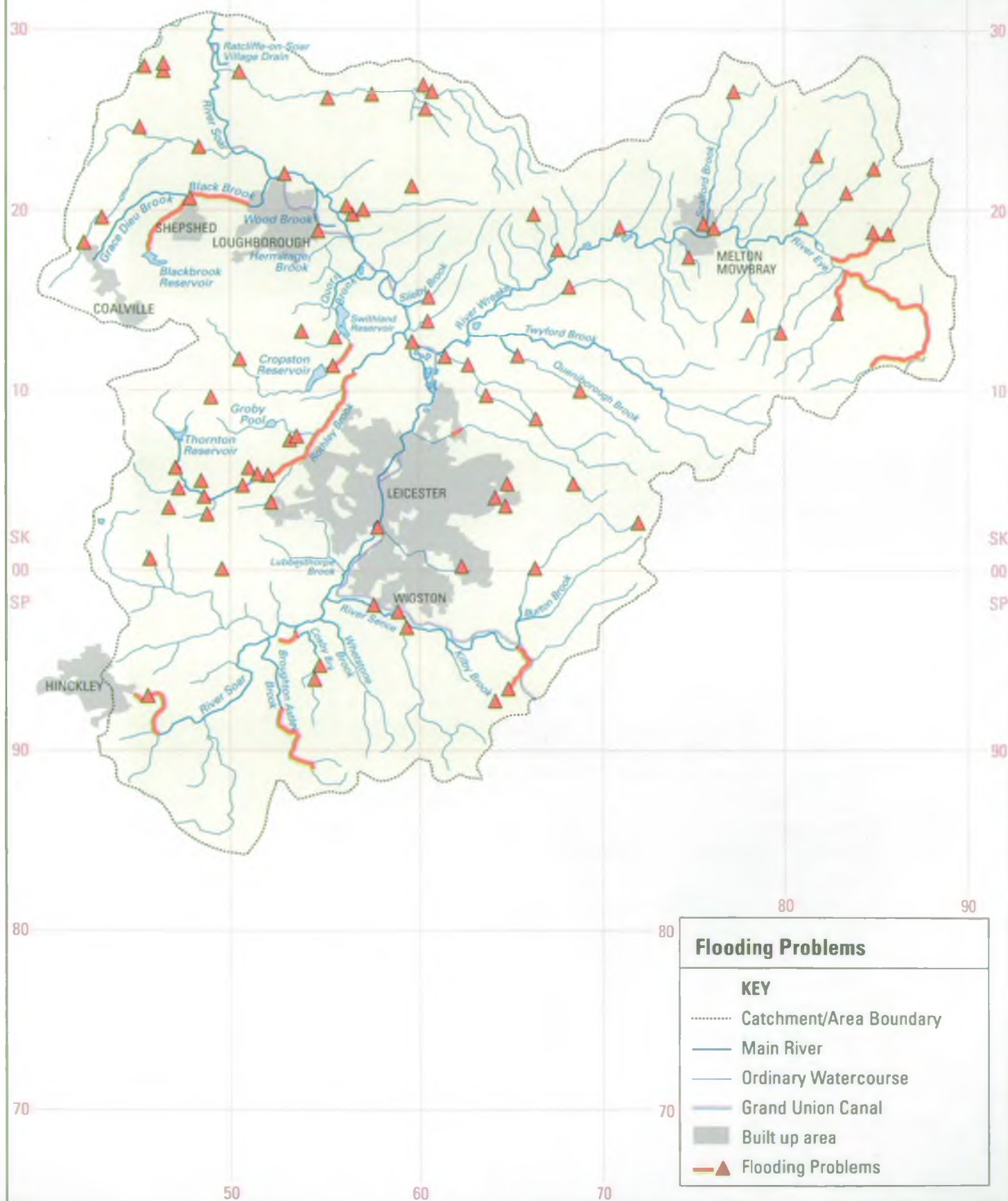
- * Provide effective protection for people and property against flooding from rivers.
- * Provide adequate arrangements for flood forecasting and warning.

To achieve these aims the Agency seeks to:

- * Maintain river defences and structures to appropriate standards.
- * Develop and implement the flood defences strategy through a systematic approach for assessing capital and maintenance requirements and develop medium and long-term plans for those defences owned and maintained by the Agency.
- * Encourage development of information technology and extension of facilities which will further improve the procedure for warning of, and responding to, emergencies.
- * Support Research and Development which will assist in identifying future flood defence needs.
- * Review best practices for all operational methods and the identification and justification of work, thus increasing efficiency and enhancing value for money.
- * Heighten general awareness of both Planning Authorities and developers of the need to control development in floodplains.
- * Identify opportunities for the enhancement of environmental, recreational and amenity facilities when undertaking flood defence works.

Current state

The current Standards of Service on the Rivers Soar, Sence, Wreake and Rothley Brook are indicated on Map 13. In general, the Standards of Service provided to these rivers have been assessed and found to be in line with the target SOS determined by the Agency as acceptable for the adjacent land use. Flood Defence aims to ensure that the existing defences are maintained to the required standard through an annual maintenance programme and asset surveys, which are due to commence in 1998/99. A recent hydrodynamic model of the River Soar has identified some properties at risk and it is proposed to investigate the feasibility of protecting these areas (see Issue 13).



Flooding Problems - the June 1990 Flooding Survey for the River Soar identified 13 flooding problems on main river in the Soar plan area of which 5 have been resolved by recent NRA and Agency Flood Alleviation Schemes. 98 problems were also identified on ordinary watercourses, but the total number of problems that have been resolved is currently being established through consultation with the relevant Local Authorities. The flooding problems are listed in Table 12 and identified on Map 22.

Table 12 - Flooding problems

Council	Main River	Ordinary watercourse	Total
Blaby DC	3	10	13
Charnwood BC	2	19	21
Harborough DC	0	15	15
Hinckley and Bosworth BC	0	13	13
Leicester City Council	1	3	4
Melton BC	0	17	17
North West Leicestershire DC	0	8	8
Oadby and Wigston DC	1	1	2
Rushcliffe BC	0	7	7
Rutland DC	0	3	3
Totals	7	96	103

It is not always possible to resolve flooding problems, as a solution to a problem may just shift it to a different location. A number of ordinary watercourses in the Soar catchment have inadequate channel capacity and would require substantial improvement schemes in order to increase their flow carrying capacity. The costs of such schemes cannot usually be justified in terms of the benefits and the impact of such schemes on the local habitat of the watercourses are likely to be unacceptable from an environmental aspect. Other problems include undersized culverts and bridges, heavy siltation and obstructions in the watercourses which cause localised flooding. The probability of many of the flooding problems on ordinary watercourses occurring could be greatly reduced by regular maintenance, which is the responsibility of the riparian owner.

6.4 Conservation and recreation

6.4.1 Conservation

Targets

The strategic objectives are:

- * To promote and further the conservation interests of the water environment, and to safeguard the conservation interests of designated sites.
- * To maintain river corridors in as natural a state as possible in order to preserve their ecological diversity.
- * To protect the landscape, together with archaeological, architectural, engineering and historical features associated with rivers and wetlands in the plan area.
- * To safeguard designated sites and, where appropriate, access to these sites.
- * To assess the environmental impact of all Agency activities and ensure that any adverse impacts are minimised and mitigated.
- * To safeguard the quality and quantity of water sufficient for this use.

Whilst the Agency has the above strategic objectives with regard to conservation, it is difficult to apply specific conservation targets in that there are no statutory objectives. In the absence of such targets, at a minimum, the Agency's principal aim in relation to conservation is:

- * To conserve and enhance wildlife, landscape and cultural heritage.

To achieve this aim, the Agency seeks to:

- * Assess and monitor conservation interest of inland and coastal waters and associated lands, river corridors and wetlands.
- * Ensure that the Agency's regulatory, operational and advisory activities take full account of the need to sustain and further conservation.
- * Incorporate the enhancement of targets habitats and species outlined in the UK Biodiversity Action Plans, when consistent with the purposes of enactments relating to Agency functions.
- * Promote conservation to enhance the quality of the aquatic and related environment for the benefit of wildlife and people.

In pursuance of the Government's commitment to biodiversity conservation, the Agency will be developing targets for species and habitats of conservation concern. These will relate to the targets for key wetland species as identified in the UK Biodiversity Action

Plan, emphasising the contribution that the Midlands Region can make to national targets. Following the Government's response to the UK Biodiversity Steering Group in May 1996, the Agency will be the "contact point" for a number of such water-related species and habitats.

Targets for the Soar area

In implementing the broad strategy in the Soar plan area, a number of specific targets are relevant:

- * To monitor habitats and associated flora and fauna of inland waters and associated lands - or river corridors and wetlands.
 - * To work with planners and developers to ensure that future development does not reduce the conservation value of the river and, where possible improves it.
 - * To undertake environmental assessment of all Agency works and identify opportunities for increasing the conservation value of rivers and wetlands and for improving the quality of the water-related landscape in association with these works.
 - * Carry out Agency consenting practices and respond to development proposals in a manner that ensures that natural features such as emergent vegetation, meanders, pool and the landscape are preserved and enhanced where appropriate, and features of archaeological, architectural, engineering or historic interest are preserved.
-
- * Seek opportunities for the Agency to carry out capital and revenue projects to protect or improve the physical character of the water environment.
 - * Liaise with other bodies to support and promote initiatives for the maintenance, enhancement and rehabilitation of wetlands and river corridors.
 - * Seek opportunities, where appropriate, to control livestock access to river banks, thus minimising bank damage and allowing regeneration of bankside vegetation in order to maintain habitat, shade cover and natural vegetation for the benefit of wildlife in the river corridor.
 - * Safeguard rare and protected species within the catchment and obtain additional information on the distribution and abundance of such species.
 - * To maintain a variable flow regime in an appropriate channel cross section where the monthly average flow reflects the natural flow condition in the river and flows do not decline below the historic monthly 95 percentile flows, except during extreme drought conditions.
 - * To maintain ground and surface water quality and level so that sensitive wetland ecosystems are protected.

Current state

The impact of man on the ecology of the plan area has resulted in the significant loss of a variety of natural and semi- natural habitats and wildlife. Woodland cover has been reduced to one of the lowest figures in the country; heathland, unmanaged grassland and hedgerows have all suffered varying, but significant degrees of degradation.

The loss of wetland resources along the Soar valley is also of concern. Wetland habitats in the area have been lost at an alarming rate to drainage, flood defence, agriculture and through a lack of proper management.

The status and distribution of native Atlantic Stream crayfish in certain parts of the plan area, is threatened. Non- native species are thought to be impacting on the native population.

Water voles are declining nationally and are thought to have declined dramatically in the area over the past 20 years. Mink are thought to have contributed to this decline.

Riverside management in some areas is in need of improvement, particularly the remaining Lowland Wet MG4 Grassland. Agricultural grant schemes could be used to achieve this.

Previous land drainage and flood defence schemes have also degraded riverine habitats, resulting in a loss of structural diversity.

6.4.2 Recreation

Targets

Setting realistic targets for recreation poses problems in that there are no recognised standards for the amount or nature of recreational use of rivers. Targets are likely to be based on the demand for facilities, although it has to be recognised that some recreational uses may be antagonistic to other river users or damaging to the environment. Any set targets must therefore take account of these factors and also fulfil the objectives laid down in the Agency Conservation Strategy.

The strategic objectives for recreation are:

- * To ensure that works on river channels do not prejudice recreational activities as far as is practicable and, where appropriate, take opportunities to enhance recreational facilities.
- * To promote the use of water and associated land for recreational purposes commensurate with the interests of other users and subject to the Agency's conservation duties.
- * To protect and promote public access to watercourses, including facilities for the disabled, within the framework of existing local authority policies for visitor management, and without unreasonably constraining other users.

- * To safeguard the quality and quantity of water so it is sufficient for its recreational use.

The control over the provision of recreational facilities rarely rests with the Agency and the achievement of objectives will therefore depend on obtaining the agreement of landowners and other interested parties.

The Agency's principal aim in relation to recreation is to:

- * Develop the amenity and recreational potential of inland and coastal waters and associated lands.

To achieve this aim the Agency seeks to:

- * Maintain, develop and improve recreation use of Agency sites.
- * Take account of recreation in proposals relating to any Agency functions.
- * Promote the use of water and associated land for recreation purposes.

Targets for the Soar area

In implementing the broad strategy in the Soar area a number of specific targets are relevant:

- * To maintain and improve water quality in order that the amenity value of the watercourses may be enhanced and protected.
- * To maximise public access to land in the Agency's ownership, places of natural beauty and to buildings, sites of archaeological, architectural, engineering and historic interest.
- * To promote the use of river corridors as a recreational facility without compromising other uses.
- * Promote suitable access and associated facilities for identified recreational uses where there is no conflict with conservation interest.
- * To safeguard existing recreational uses and where practicable, incorporate recreational facilities into Agency schemes being designed for other reasons.
- * To work with planners and developers to ensure that future development does not reduce the recreation value of rivers, and where possible improves it.
- * To encourage the development of footpath access along Agency owned river bank.

In pursuance of these aims the Agency seeks to:

- * Take into account the needs of persons who are sick or disabled.
- * Maintain and enhance the diversity of natural river features and other riverine habitats.
- * Maintain and enhance the diversity of aquatic vegetation and of the river corridor in general.
- * Take account of recreational use when setting water quality objectives, and minimum flows/levels and when determining planning applications and applications for effluent discharge or abstraction.
- * Open land under Agency ownership up to wider recreational use by the public where recreation potential has been identified.

Current state

Angling is the most popular waterbased activity with clubs controlling most of the fishing along the Soar and the Wreake. In addition, the gravel pits and reservoirs in the plan area offer both coarse and game fishing.

Water based recreation is also dominated by pleasure boating, which takes place along the Soar and the Grand Union Canal Navigation. The navigation system is currently controlled by British Waterways, who carry out a lot of work to maintain the navigation and its associated facilities. Some canoeing and rowing also takes place on some reaches of the Soar and its tributaries.

The plan area is well served with public Rights of Way, which are currently considered to be under used by walkers and cyclists. The Charnwood Forest, by comparison, is well utilised by the public for walking and bird watching.

It is likely that recreation in the plan area will increase with time. However it is important that a balance is struck between the demands of recreation and those of conservation, as well as respecting the rights of riparian landowners.

6.4.3 Fisheries

Targets

The general aim for all fisheries is

- * To ensure that natural mixed healthy sustainable fish populations are present in all watercourses where those species have historically been shown to be present.

Trends in fish stock abundance can be identified and comparisons made with 'expected' abundances based upon habitat characteristics. A Fisheries Classification system based on this concept is currently under development and will be used to generate fish population targets in the future. The Agency has documented its Fisheries Strategies for all appropriate river reaches in the Midlands Region. It will use its legislative powers to ensure that the objectives for individual river reaches are achieved.

The strategic objectives are:

- * To maintain, improve and develop fisheries.
- * To sustain a natural fish population appropriate to the catchment.
- * To safeguard habitats suitable for thriving fish populations.
- * To provide suitable conditions for successful angling.
- * To improve angling by implementing measures to increase fish stocks where possible without adversely affecting water quality or nature conservation interests.
- * To safeguard the quality and quantity of water sufficient for thriving fisheries.

Targets for the Soar area

The fisheries targets for the Soar area are to:

- * Control illegal fishing by bailiffing.
- * Monitor fish populations by a scientific programme.
- * Maintain habitats for fish and where possible improve them.
- * Maintain fish abundance and improve this wherever possible, such as fish stocking where this is biologically viable.

Current state

The River Sence in its lower reaches suffers from habitat degradation with a low to moderate biomass. The upper river is a diverse, high biomass fishery.

The River Wreake is generally a high quality profile fishery which suffers from localised habitat degradation. A high range of species is found here.

The River Soar is a good fishery throughout its length. As the river flows downstream, the physical habitat becomes less important to the fish because the water is deeper. This means a trout population in the upper reaches gives way to a dace/chub population, then to a roach/ bream population in the lower reaches. Table 13 below gives fishery survey information for rivers in the area.

Table 13 - Fishery survey information

River	Site	No of Species	Biomass g/m ²
Soar	Ramsdale Farm	7	16-46
	Croft	8	20-56
	Bluebank Lock	7	4-8*
	Abbey Park	5	2*
	Watermead Park	8	25
	Cossington Mill	12	4*
	Cotes Mill	8	12-24*
Wreake/Eye	Hams Bridge	4	16
	Brentingby	2	33
	Egerton Park	3	18
	Crows Weir	6	11
	Brooksby	7	13
	Rearsby	6	39
	Lewin Bridge	6	1*
Sence	Wistow Hall	5	22
	Kilby Bridge	9	29
	Foston Lodge Farm	9	53
	Glendale	5	3*

NB the sites marked * are too deep or wide for an accurate measure to be made of biomass.

The Agency's principal aim as set out in The Environment Act 1995,

'...in discharging its functions the Agency is required, so as to protect or enhance the environment, taken as a whole, in order to play its part in attaining the objective of sustainable development, as guided from time to time by ministers.'

Our Objectives

Ministers have issued statutory guidance on sustainable development. This includes our seven main objectives:

- * An integrated approach to environmental protection and enhancement, taking into consideration the impact of all activities and natural resources.
- * Delivery of environmental goals without imposing disproportionate costs on industry or society as a whole.
- * Clear and effective procedures for serving its customers, including the development of single points of contact with the Agency.
- * High professional standards, using the best possible information and analytical methods.
- * Organisation of its own activities to reflect good environmental and management practice, and provision of value for money for those who pay its charges, as well as for taxpayers as a whole.
- * Provision of clear and readily available advice and information on its work.
- * Development of a close and responsive relationship with the public, including local authorities, other representatives of local communities and regulated organisations.

In order to achieve these objectives the Agency will use its statutory powers and work in collaboration and partnership with various organisations and individuals. This will include local government, industry, conservation groups, the farming community and the general public.

The Agency's work is described below:

- * **Flood Defence** has the role of protecting people and the developed environment from flooding by providing effective defences and protecting the natural floodplain.

Safeguarding life is its highest priority and to meet this aim it runs a flood forecasting and warning service as well as providing defences. Flood Defence also has an aim to protect and enhance the natural environment by promoting works that are sustainable and work with nature. (see further detail below).

- * **The Water Resources** function comprises the conservation, redistribution and augmentation of surface and groundwater supplies. It includes the powers to encourage water conservation, to promote transfer schemes and to balance the needs of water users and the environment by issuing licences to abstract water from rivers

and boreholes.

* **Pollution Prevention and Control** - this involves:

- Integrated Pollution Control (IPC) which is applied to the largest, technically most complex and potentially polluting industrial processes regulated by the Agency.
- Radioactive Substances - regulating the disposal of radioactive material, including that from licenced nuclear sites, and regulating and accumulation, keeping and use of radioactive materials, except from licenced nuclear sites.
- Water Quality. We aim to achieve a continuing overall improvement in the quality of rivers, estuaries and coastal waters through pollution prevention and control. In achieving this we aim to ensure that the dischargers pay the costs of the consequences of their discharges.
- Waste Regulation setting consistent standards for waste management practice to regulate the treatment, storage, movement and disposal of controlled waste. The Agency also has a requirement to register and monitor those who produce waste imposing obligations to re-use, recover or recycle products and materials.
- Reporting on the extent of contaminated land and contributing to its management (primarily undertaken by local authorities). Abandoned mine operators are also required to work with the Agency so that steps can be taken to prevent minewater pollution in the future.

* **Fisheries.** The Environment Agency is responsible for maintaining, improving and developing fisheries. This is carried out by licensing, regulation and enforcement activities schemes which cover salmon, coarse and eel fisheries. The Agency also enhances fisheries by improving habitats, fish stocks and providing advice to fishery owners.

* **Navigation.** This function is responsible for managing and improving over 800km of inland waterways. It aims to make these resources widely available to the public for water or land based recreational use. The Agency must also take account of **Recreation** and access. Over 1,000 sites in our control are managed for recreational use. We also have a general duty to promote recreational use of water and land throughout England and Wales.

* **Conservation.** In fulfilling all its functions the Environment Agency is required to contribute to the conservation of nature, landscape and archaeological heritage. We have a regard to conserving and enhancing flora, fauna, geological or physiographical features when carrying out our pollution control functions, and a duty to further conservation when carrying out our other functions. We also have a duty generally to promote the conservation of flora and fauna dependant on the aquatic environment.

APPENDIX 2 Environmental monitoring carried out by the Agency

Rainfall

Rainfall is measured by daily raingauges, some of which send information via the Agency to the Meteorological Office. They are read by observers who send returns monthly for data quality control and archiving. In addition, 6 automatic raingauges record short duration rainfall intensity on data loggers and are also contacted by the computer based forecasting system.

River levels and flows

Levels are continuously monitored at 6 sites from which flows can be derived at 6 sites, including two ultrasonic gauges and three electromagnetic gauges. One further flow measurement station is not currently in use. Five of these gauges have telemetry outstations, allowing automatic data retrieval by telephone, providing up to date information for abstraction control, river regulation and flood warning operations. More extensive low flow surveys, based on spot gaugings are undertaken during drought periods.

Groundwater levels and other monitoring

The Agency determines groundwater quality from a network of boreholes across the region. The boreholes are principally located on Major Aquifers, and to a lesser extent on Minor Aquifers. As a consequence of the low vulnerability of groundwater within this area, there is only a single Agency Groundwater Chemistry Network site monitored in the plan area.

Surface Water Quality

Chemical monitoring

Water quality samples are taken on a monthly basis from a network of 70 key sites on rivers and canals in the plan area. The samples are analysed for a wide range of substances, the results being used to assess compliance with a range of EC Directives, Rivers Ecosystem classification targets and for General Quality Assessment purposes (see section 6). In addition to the routine monitoring of river quality, samples of consented discharges are regularly taken and analysed to assess compliance against targets set by the Agency. Samples are also taken during the investigation of pollution incidents, both to help track down sources of pollution, and as evidence against offenders.

Biological monitoring

In addition to the chemical monitoring of watercourses, the quality of surface waters is also assessed by using the invertebrate community present, as an indicator of overall water quality. Scoring systems are used for the species found, with high scores being given to species known to be intolerant of pollution, and lower scores given to species which can live in fairly polluted water. A high total score indicates a river of consistently good quality, while a lower score indicates one which is chronically or intermittently polluted.

Biological monitoring is routinely carried out twice yearly at 18 sites on the River Soar itself and another 70 sites on the tributaries, which are generally matched with chemical sampling sites. In addition, catchment surveys are carried out on an ad-hoc basis as well as work to investigate poor routine site results and post pollution impact assessments.

Flood defence

The main data collection for flood defence purposes is the hydrometric data from Agency gauging stations. During flood events, additional data is collected by Agency Flood

Defence personnel reading gauge boards or recording flood levels. This data is subsequently used to calibrate or recalibrate computer models of main rivers

Conservation and recreation

River corridor surveys have been completed for the majority of the main rivers in the plan area, and river habitat surveys have also been undertaken.

Fisheries

Fisheries monitoring is carried out in a rolling programme every three years. 48 sites are electric fished. Six sites on canals are also monitored. At the moment, these are reported as results on a standalone basis, but in future a fisheries Classification system will be used. This system compares actual with expected figures, and will be in effect from 1 April 1997.

Waste

The monitoring of boreholes at licensed waste management sites is the responsibility of the waste operator, and the data is provided to the Agency. The Agency will periodically undertake audits of the data by carrying out check monitoring.

Air

Within the Soar plan area there are two automatic (continuous) monitoring sites: Bottesford (start 1/10/77) monitoring ozone, and Leicester city centre (start 4/1/94) monitoring ozone, oxides of nitrogen, carbon monoxide, sulphur dioxide and PM₁₀ particulate matter. Local authorities in the catchment area have air quality monitoring programmes tailored to the needs and likely pollutants and potential in their area.

General information and Standards of Service land use bands and targets

The Nature of Flooding

The river network carries surplus water from land to the sea as part of the natural water cycle. Rivers and watercourses can only cope with a certain maximum flow and when this is exceeded flooding occurs. Flooding can be caused by prolonged rainfall, thunderstorms or rapid snowmelt. The peak flow of a flood is measured and expressed in terms of the frequency at which that flow is statistically likely to recur, for example 1 in 10 years or 10% chance in any one year.

Individual watercourses will respond differently to the same rainfall conditions due to variations in catchment areas and land use. For example, an urbanised catchment with a high proportion of paved surfaces and drains, will have rivers whose levels respond relatively quickly to rainfall. The more open countryside of a rural catchment will often allow more of the rain to soak into the ground and thus slow down runoff, so river levels will rise less rapidly but remain at the higher level longer.

Localised flooding may also occur where watercourses become blocked at particular points such as under bridges or in culverts. Often debris gathering at these points includes garden waste and other rubbish which has been deposited on river banks, and this can be a major problem in urban areas. Flooding can also occur where surface water drains are unable to discharge into swollen watercourses, or further back in the surface water drainage system where their capacity is exceeded.

When watercourses flood, water flows into the floodplain. These natural floodplains (which are as much a part of the river system as the channel which carries normal flows) provide extra capacity for the storage and passing downstream of flood water. This capacity is reduced if significant areas of floodplain have been raised, embanked, or built upon. The loss of storage volume can lead to higher river levels elsewhere and for this reason it is not possible (or desirable) to alleviate flooding in all areas. The priority for flood alleviation lies in urban areas as undeveloped floodplains should be allowed to play their natural role as the continuity between the river and its floodplain as an essential part of the water cycle.

A key aim of the Agency is to provide effective protection for people and property against flooding from rivers and to provide adequate arrangements for flood forecasting and warning.

Regulation

Main River

All watercourses are classified as either 'main river' (which is defined on maps held by the Agency and MAFF) or 'ordinary watercourse' (sometimes referred to as 'non-main river'). In broad terms main river includes all watercourses which contribute significantly to a catchment's drainage though ordinary watercourses may be more significant locally. The legislation dealing with main rivers is the Water Resources Act 1991 and is supplemented by local Byelaws. The Agency supervises all flood defence matters but has special powers to carry out or control work on main rivers.

Local authorities and in some areas Internal Drainage Boards (IDBs) are responsible for flood defence on ordinary watercourses. The appropriate legislation relating to ordinary watercourses is to be found in the Land Drainage Act 1991.

Proposed revisions to main river are dealt with through a consultation and advertising process with the decision whether to main a river, or not, being made by MAFF.

Flood Risk Areas - DoE Circular 30/92 - Section 105 Surveys

It is preferable to avoid increased risk from flooding through control of development than to have to carry out works to alleviate problems once they occur. The relevant authority for controlling development in the floodplain is not the Agency but the Local Planning Authority (LPA) through the Town and Country Planning Act 1990 process.

LPAs and the Agency are required by the Department of the Environment in Circular 30/92, on Development and Flood Risk, to liaise closely on flooding and surface water runoff matters. The aim is to ensure that flooding risks that might arise from a development are recognised and made an integral part of the decision making process undertaken by LPAs. Flooding and drainage issues are also to be taken fully into account during the preparation of land use development plans.

In this respect the Agency has responsibility to prepare surveys under Section 105 of the Water Resources Act 1991 to define the nature and extent of flood risks.

Table 12 and Map 22 show flooding problems, identified in the 1990 survey, in the area covered by the plan.

Land Drainage Consents

The Agency's consent is required for works on or near the bank of a main river. This includes construction in, over, under or within 8 metres of the watercourse including such activities as the planting of trees and mineral extraction. On ordinary watercourses, consent is only required for building any structure that would affect the flow. These powers are used to ensure that people both upstream and downstream of the proposed works are not exposed to an increased risk of flooding.

Access along river banks for staff and equipment needs to be preserved wherever possible, especially for emergency works. To ensure this access is kept clear we will not grant a consent to any development within 8 metres of a main river watercourse which would compromise flood defence work activities.

In deciding whether to issue a consent we will also take into account whether the proposed works conserve and enhance the environment.

Surface Water Control

Surface water runoff is likely to be increased to some degree as a result of development as more impermeable surfaces such as roofs and pavements are created. The impacts of such development, however small, add up and can lead to significant problems in due course. Increases in both the amount and rate of water reaching rivers can, if not managed, lead to greater risk of flooding. We will seek to ensure new development is carefully located and designed. Where appropriate we will require measures to control surface water to be incorporated into the overall development.

Water Level Management Plans

Recent guidance has been issued by the government on the preparation of Water Level Management Plans for Sites of Special Scientific Interest or other areas of high ecological

or landscape importance. Where we are the operating authority, we will liaise with English Nature to prepare a plan to ensure appropriate key water levels are safeguarded.

Reservoirs Act Supervision

The supervision and inspection of large reservoirs holding more than 25,000 m³ above the adjacent lowest ground level is defined in the provisions of the Reservoirs Act 1975. The definition does not require the reservoir normally to hold water and therefore a flood storage area, if large enough, may come within the definition. It is proposed that the Environment Agency will take over the enforcement role of all reservoirs from the local authorities on 1 April 1997, or when the Deregulation Order comes into place. This will place a duty on the Agency to supervise reservoir inspection by a qualified engineer each year to ensure they are in a safe condition.

Operations

Agency Owned Structures

River control structures generally control water levels upstream but can be adjusted to allow storm water to pass downstream. We and our predecessor organisations have constructed a significant number of gates, weirs, pumping stations and other such structures to complement river channel improvements.

Privately Owned Structures

Privately owned structures are common on watercourses, for a variety of traditional water uses such as operation of mills, creation of navigation channels and fish farming and amenity. By law these must be maintained and operated properly by their owners if they affect river levels and flows. The condition of privately owned structures can be of concern.

Flood Defence Standards of Service

As an aid to decisions on priorities for works we have determined Standards of Service for flood defence based on land usage within the floodplain. Five "land use bands", have been established, based on the presence and concentration of certain features of land use. These include housing, commercial property, agriculture, highways and other transport networks. Such features are each allocated a financial value (based on the potential losses that would ensue if the features were subject to flooding) which allows comparison of different features on the same basis.

Each land use band has a target for the maximum flood risk to which it should be exposed. The standards are expressed in terms of the frequency at which a flood is likely to occur which exceeds the magnitude for which protection is available or should ideally be provided.

For example, a standard of 1 in 50 years means that, for any given year, the likelihood of a flood flow occurring which significantly affects key land use features, is 50 to 1 or 2% in any one year.

Descriptions of land use bands are given in Table 14 below. Map 13 shows the various land use bands for main river in the area covered by this plan.

A comparison of the target and actual standards of service allows improvement and maintenance works to be prioritised towards those rivers which do not meet their target standards.

Table 14 - Standards of Service land use bands and targets

Land use band	Description of typical land use	Targets standard of protection (return period)	
		Fluvial	Saline
A	High density urban areas containing significant amounts of both residential and commercial property at risk.	1:50 - 1:100	1:100 - 1:200
B	Medium density urban areas, some parks and open spaces, or high grade agricultural use at risk.	1:25 - 1:100	1:50 - 1:200
C	Low density urban areas or rural communities. Typically large areas of high grade agricultural land with some properties also at risk from flooding.	1:5 - 1:50	1:10 - 1:100
D	Generally farmland with occasional properties at risk. Medium productivity agriculture which may also be prone to the effects of waterlogging.	1:1.25 - 1:10	1:2.5 - 1:20
E	Typically low grade agricultural land or public open space, often grassland or scrub, with very few properties at risk.	<1:2.5	<1:5

Routine Maintenance Regime

The Agency does not own watercourses (except in a few specific locations where flood defence structures have been constructed and their ownership retained). The ultimate responsibility for the upkeep of a watercourse rests with the person who owns the land on the side of the river (also known as the riparian owner).

We have permissive powers, on main river, to undertake works and exercise our powers in this respect according to available resources and priorities. Regular maintenance is essential if the river system are to operate properly at times of high water levels. Such maintenance works include vegetation control, repairs to earth embankments and other floodwalls, obstruction and blockage removal and dredging. Maintenance can contribute significantly to reducing the risk of flooding.

Failure to maintain, nationally, over 36,000 km of main river defences and 800 km of sea defences would result in their deterioration and put at risk over 850,000 properties and the two million people who rely on them for protection from flooding.

Emergency Response

At times of high water levels in addition to our floodwarning role (see Section 5) our operational priorities are to patrol the defences, check and operate flood defence structures, remove blockages and carry out any emergency repairs needed.

District Councils have permissive powers to offer assistance to owners and occupiers during floods. This may include placing sandbags, moving possessions, evacuating people. Each Council has a different policy on the type and amount of help they give.

The fire service provides help in flood emergencies if they are able to do so. The local station will be able to advise the public on what help is, or is likely to be, available and whether or not a charge will be made.

Depending on the location the County Council or the Local Unitary Authority are responsible for public highways and would deal with any flooding problems associated with road drainage: All County Councils and Unitary Authorities have Emergency Planning Officers who may become involved in more serious flood events.

Public surface water sewerage systems are the responsibility of the local Water Company, who may sometimes use Councils as their agents.

Improvements

Capital Works

In addition to general maintenance work, the Agency can build new flood defences if flooding is a serious problem in a particular area. Nowadays we usually only build new defences to protect built up areas from flooding. All schemes must be technically, economically and environmentally sound. We keep a list of schemes called a Programme of Capital Works which helps us to plan for the future.

Duty of Care for Conservation

All new schemes and maintenance works are carried out after consultation with our conservation staff to ensure that the work is done in an environmentally acceptable manner. Under the legislation three main areas have to be considered, namely to take into account the impact of proposals on natural features, to have regard to protection features of historic interest, and to further the conservation and enhancement of flora, fauna and other natural features.

The promotion of waste prevention involves educating the public, commerce and industry through the distribution of leaflets and guidance, visits to companies and schools, seminars and involvement with business clubs.

Effective regulation means maintaining a consistent approach to the day to day control of waste. This involves monitoring the treatment, keeping, moving and disposal of controlled waste as well as the investigation of unauthorised activities. The objective of regulation is to prevent the pollution of the environment or harm to human health. The Department of Environment's Waste Management Paper No. 4 provides guidance on the targets for the frequency of inspections on controlled waste activities.

There is a need to improve information about waste management, not just waste statistics, but also on environmental pollution. A strong well informed base is needed to obtain an overview of the state of the environment for the Agency to provide informed advice to the Government in the preparation of the National Waste Strategy.

Waste Targets

The Department of the Environment's White Paper on waste 'Making Waste Work' sets out the government's policy framework for the management of waste. The various waste management options have been ranked into the hierarchy which gives a broad indication of their relative environmental impacts. The White Paper identifies ways in which waste can be managed in a more sustainable way and sets targets for achieving that aim. These targets aim to move the emphasis in our waste management practices further up the waste hierarchies shown below:

The Waste Hierarchy

REDUCTION
RE-USE
RECOVERY (Recycling, Composting, Energy Generation)
DISPOSAL

The government's strategy includes both general targets and targets relating to particular waste streams. The targets which the Agency will play a major role in achieving, and will endorse as targets for the area are:

- * To stabilise the production of household waste at its 1995 level.
- * To reduce the proportion of controlled waste going to landfill by 10% over the next 10 years; and to make a further similar reduction in the following 10 years.
- * To recycle 25% of household waste by the year 2000.
- * 75% of companies with more than 200 employees to have published environmental policies covering waste issues by the end of 1999.
- * 50% of companies with more than 200 employees to have management systems in place to give effect to their environmental policies by the end of 1999.

The Agency will need to develop strong contacts with local waste disposal and collection authorities to ensure the success of recycling and the sustainable management of household waste.

In carrying out these and other functions to the highest standards on all issues related to sustainable waste management, the Agency will make a contribution to achieving sustainable development policies. The government's objectives will be implemented through encouragement and cooperation with local authorities, and more directly through strengthening links with industry. The control of potential pollution from waste will continue to be effected through waste management licensing and site inspections, supported by strong enforcement action where this is necessary, to ensure that the "polluter pays" principle is upheld.

Household Waste

There is potential for increasing the amount of household waste that is recycled by the Districts to meet the Government's 25% target by the year 2000. This depends on a number of factors which include the availability of suitable sites for collection banks, the strength of the markets for the materials collected and the degree of public participation.

Materials such as paper, glass, cans and textiles are collected for recycling via 'bring-banks' provided by the District Council, by various voluntary groups, local charities and by the household reclamation sites provided by the County Council. Household reclamation sites also provide facilities for scrap metals, used engine oil, unwanted household chemicals and CFC's.

Commercial and Industrial Waste

Commercial and industrial wastes arise in liquid solid and sludge form. The types of waste and the quantity produced in the area is a function of both the type of industry and commerce carried out in that area and the degree of industrialisation.

Reused wastes include wood, animal and food waste, waste oils and solvents. Wood is mainly used as a secondary raw material for the production of chipboard. Food wastes are used as secondary raw material for the production of animal foods or soaps. Waste engine oils are cleaned and re-used as oils or they may be blended and used as secondary fuels. Solvent wastes are filtered and re-used.

Whilst all wastes can become hazardous if not handled and managed, some wastes are recognised as requiring particular precautions and therefore have to be handled in accordance with certain procedures. Such wastes are termed special wastes and include flammable and toxic wastes.

Clinical Waste

Clinical waste arises from two sources, namely hospitals and associated Health Authority premises and from other sources such as residential homes, veterinary and dental practices and private hospitals. The wastes are segregated for disposal purposes through a system of coloured bags. Apart from small quantities of household type material, all the clinical waste in the area is disposed of by incineration through the National Health Service Trusts contracts.

Construction and Demolition Waste

This waste consists of rubble, hardcore, soil and subsoil from the building trade, the construction industry and local authorities. The waste can be very variable, from clean soil or hardcore to a mixed nature containing wood, paper, plaster, metal and other similar materials.

Constructon and demolition wastes have considerable potential for recycling. The recycling and reuse of these materials can make a significant contribution to the rate of extraction of minerals and aggregates. The Government have recognised this potential and the Agency will persue ways and means of increasing recycling in order to reduce the quantity being taken to landfill.

Waste Management -Landfill Sites

The actual remaining life of any one landfll will be dependent on a number of factors including:

- * number of sites competing
- * operationing limits set by the licence
- * the quantity of waste requiring disposal

With regard to the quantity of waste for disposal, as waste minimisation, reuse and recycling initiatives become established the quantity of waste requiring disposal should decrease. Indeed it is recognised that the current level of landfilling is not sustainable in the long term and there is a finite amount of void space available. However no matter how well developed alternative options for managing waste become, some waste will always need landfillling.

The Environment Agency's ability to act to maintain and, where necessary, improve the environment is dictated by National and European Community (EC) Legislation. The legislation imposes duties on the Agency that it must carry out. Other provisions take the form of powers that the Agency uses to fulfil its duties and meet its aims. This combination of duties and powers determines the broad allocation of effort and resource.

National Legislation

Environmental Protection Act 1990 (and Regulations)
Environment Act 1995
Water Resources Act 1991 (WR Act 1991)
Land Drainage Act 1991
Salmon and Freshwater Fisheries Act 1975
Police Act 1964 and the Police and Criminal Evidence Act 1984
Wildlife and Countryside Act 1981
The Conservation (Natural Habitats) Regulations 1994

European Legislation

The Agency is responsible for enforcing some EC Directives. A directive is an item of legislation which is legally binding on Member States. A summary of the most relevant directives is given below:

Dangerous Substances Directive (76/464/EEC)
Freshwater Fisheries Directive (78/659/EEC)
Surface Water Abstraction Directive (75/440/EEC)
Urban Waste Water Treatment Directive (91/271/EEC)
Nitrate Directive (91/676/EEC)
Habitats Directive (92/43/EEC)

APPENDIX 6 Pollution incidents and supporting data

Pollution Incidents

The Agency deals with a wide range of pollution incidents. Pollution of the environment is a criminal offence and the Agency will prosecute whenever necessary.

Water Pollutions

During 1996, 582 pollution incidents were reported and investigated in the Soar plan area. Of these 3 were classed as major (Category 1) incidents and 10 as being significant (Category 2) incidents. Table 15 summarises the pollution incident data for 1996 by cause and type.

Table 15 - Pollution Incidents 1996

-Type	Category 1	Category 2	Category 3	TOTAL
Industrial & Commercial	2	2	90	94
Water Utility Companies	0	2	117	119
Agriculture	0	1	19	20
Other	1	5	228	234
Unsubstantiated				115
	3	10	454	582

Type	Category 1	Category 2	Category 3	TOTAL
Chemical	2	1	58	61
Oil	0	5	174	179
Sewage	0	1	86	87
Agriculture	0	1	23	24
Other	1	2	113	116
Unsubstantiated				115
	3	10	454	582

Category 1: A major incident involving one or more of the following:

- Potential or actual persistent effect on water quality of aquatic life
- Closure of potable water, industrial or agricultural abstractions necessary
- Extensive fish kill or significant adverse effect on conservation site
- Excessive breaches of consent conditions

- Extensive remedial measures necessary
- Major effect on amenity value

Category 2: A significant pollution which involves one or more of the following:

- Notification to abstractors necessary
- Significant fish kill
- Measurable effect on invertebrate life
- Water unfit for stock
- Bed of watercourse contaminated
- Amenity value to the public, owners or users reduced by odour or appearance

Category 3: A minor pollution incident which results in localised impact only. The following criteria may apply:

- No notification of abstractors necessary
- Mortality of less than 10 fish
- No observable effect on invertebrate life
- Minimal environmental impact and amenity value only marginally affected

Category 4: (Unsubstantiated)

A reported pollution incident which upon investigation proves to be unsubstantiated, with no evidence of a pollution incident having occurred.

The Agency responds to reports of pollution incidents at all times and has a 24 hour emergency hotline for members of the public to report any water, air or land-related incidents.

Environment Agency Emergency Hotline: 0800 80 70 60

APPENDIX 7 Results of informal issues consultation

Introduction

During May 1996, all city, county, district and borough councils in the Soar LEAP area were contacted, together with 160 other organisations who have an interest in the local environment. In total over 175 organisations were contacted

This pre consultation exercise was designed to focus on key groups and organisations that were likely to have information on and ideas about the sort of environmental problems facing the area. 47 of the 175 consultees responded (27%). A breakdown of these responses is given in the table below.

Overall comments on the issues raised was supportive. Some specific additional issues did arise from the pre consultation responses and these have been incorporated into the issues as described in section 3 where appropriate.

Table 16 - Responses to pre consultation on issues

Classification of Consultees	No. of Consultees	No. of Responses	Response Rate (%)
Water Companies and water interest groups	11	2	18
Nature conservation groups	14	5	36
Environmental, archaeology and heritage interest groups (Inc LA Depts)	16	7	44
Local authorities:- Planning and development	16	8	50
Industry/ agricultural interest groups	28	7	25
Countryside, landowners and forestry groups	8	3	38
Recreational groups	42	7	17
General consultees	28	7	25
Local industry	12	1	8
Total	175	47	27

Soar Consultee List - February 1997

Acresford Sand & Gravel
 ADAS
 Anglers Conservation Association
 ARC Central
 Asfordby Society of Anglers
 Awworth & Cossal Angling Club
 B&C Defence Works Services
 BEAM Services Ltd
 Blaby District Council
 British Waterways
 British Hydrological Society
 British Trust for Ornithology
 British Trust for Conservation Volunteers
 British Aggregates Construction Materials Industries
 British Association for Shooting & Conservation
 British Sub Aqua Club
 British Canoe Union
 Broome Angling Club
 BSAIF
 Bullimores
 Butterley Aggregates
 CBI - East Midlands
 Charnwood Wildlife Project
 Charnwood Borough Council
 Civil Aviation Authority
 Clean Rivers Trust
 Coal Contractors Ltd
 Cobden Angling Club
 Council for the Protection of Rural England
 Country Landowners Association
 Countryside Commission
 Crown Estates Commissioners
 Defence Works Service
 Department of the Environment
 East Midlands Rowing Council
 East Midlands Tourist Board
 East Midlands International Airport
 East Midlands Regional Sports Council
 ECC Quarries Ltd
 English Heritage
 English Nature (HQ)
 English Nature
 Environ
 ETSU
 Everard Bardon Ltd
 Farming & Wildlife Advisory Group
 Forestry Authority
 Friends of the Earth
 Greenhills Angling Club

Greenpeace
 Greenways Landfill
 H J Banks Ltd
 Hanson Brick Ltd
 Harborough District Council
 Hepworth Building Products Ltd
 Hinkley & Bosworth Borough Council
 Housebuilders Federation (Midlands Region.)
 Istock Building Products Ltd
 IDB - (Kingston Brook)
 Infrastructure Services Unit (NE)
 Inland Waterways Association
 Institute of Sport & Recreation Management
 Institute of Packaging
 Institute of Terrestrial Ecology
 Institute of Hydrology
 Institute of Waste Management
 Institute of Civil Engineers
 Jelson Angling Club
 Kegworth Angling Club
 Kegworth Angling Society
 Landmark Northwest Leicestershire
 Leicester Footpaths Association
 Leicester City Council
 Leicester & District Amalgamated Society of Anglers
 Leicester Angling Federation
 Leicester Urban Fringe Countryside Management Project
 Leicester & Rutland Trust for Nature Conservation Ltd
 Leicestershire Association of Parish & Local Councils
 Leicestershire County Council
 Leigh Environmental Ltd
 Long Eaton Victoria AC
 Long Eaton Federation AC
 Loughborough Soar Angling Society
 Loughborough Naturalists Club
 MAFF
 Melton Borough Council
 MP - Blaby (A Robathan)
 MP - Bosworth - (D Tredinnick)
 MP - Rushcliffe (RtHon Kenneth Clarke QC)
 MP - Leics South (James Marshall)
 MP - Leics West (H Greville Janner QC)
 MP - Harborough (E Garnier)
 MP - Leics NW - (David Ashby)
 MP - Loughborough (Rt Hon Stephen

Dorrel)
 MP - Rugby (James Pawsey)
 MP - Rutland & Melton (A Duncan)
 MP - Leics East (K Vaz)
 National Trust
 National Forest
 National Farmers Union
 National Association of Clay Industries
 National Association of Waste Disposal
 Contractors
 National History Museum
 Natural History Museum
 Nottingham Civic Society
 Nottingham AA
 Nottinghamshire Constabulary
 Nottinghamshire Association of Local
 Councils
 Nottinghamshire County Council
 Nottinghamshire Wildlife Trust
 Nottinghamshire Birdwatchers
 Office of Water Services
 Otter Trust
 Parish Council - (Normanton on Soar)
 Quorn Anging Society
 Railtrack
 Reabank Manufacturing Company Ltd
 Ready Mixed Concrete Ltd
 Redhill Boat Club
 Redland Aggregates Ltd
 Regional Sports Council
 Residential Boat Owners Association
 RJB Mining (UK) Ltd
 Road Haulage Association
 Royal Yacht Association - (East Mids)
 RSPB
 Rugby Borough Council
 Rural Development Commission
 Rushcliffe Borough Council
 Rutland District Council
 Salmon & Trout Association
 Sand & Gravel Association
 Severn Trent Water
 Shaftsbury Angling Club
 Shank's & McEwan (Waste Services) Ltd
 Sileby Mill Boatyard
 Sileby Independent
 Sneinton Civic Society
 Soar Boating Club
 Soil Association
 Soil Survey & Land Research Centre
 Sustrans
 Sutton Bonnington Anglers
 Swithland Sand & Gravel Ltd
 Tarmac Quarry Products Ltd

Tarmac Roadstone Ltd
 The Coal Authority
 The Ramblers Association
 The Institute of Sport & Recreation
 Management
 The Tidy Britain Group
 The Historic Narrowboat Owners Club
 Tilcon Ltd
 Trent Boating Association
 University of Aston
 University of Newcastle
 University of Birmingham
 University College London
 University of Nottingham
 Wanlip Gravels Ltd
 Warws & W Mids Metropolitan
 Association of Parish & Town Councils
 Water Services Association
 Welford Marina
 Wessex Water
 West Midlands Conservancy
 Wigston Angling Society
 Wildlife Trust
 Williamson Cliffe Ltd
 Wreake AC
 Zingari AC

APPENDIX 8 Glossary and Bibliography

Abbreviation	Full Name
BC	Borough Council
BW	British Waterways
CC	County Council
CoCo	Countryside Commission
DC	District Council
EN	English Nature
EP	English Partnerships
FWAG	Farming and Wildlife Advisory Group
IWA	Inland Waterways Association
LA	Local Authorities
LPA	Local Planning Authorities
LRTNC	Leics and Rutland Trust for Nature Conservation
MAFF	Ministry of Agriculture, Fisheries and Food
MPA	Minerals Planning Authority
NF	National Forest
PHABSIM	Physical HABitat SIMulation computer model
RBC	Rushcliffe Borough Council
STP	Sewage Treatment Plant
STW	Severn Trent Water Ltd
WT	Wildlife Trusts

Abstraction	The removal of water from any source, either permanently or temporarily.
Abstraction Licence	A statutory document issued by the NRA to permit removal of water from a source of supply. It can limit the quantity of water taken daily etc.
Acid Deposition	The removal from the atmosphere by trees, plants, and the earth's surface of sulphur and nitrogen containing compounds.
Acidification	The detrimental effect of acid rain on soils and freshwater.
Acid Rain	Rain, snow, fog and mist contaminated by sulphur and nitrogen.
Agenda 21	A comprehensive programme of worldwide action to achieve a more sustainable pattern of development for the next century. UK Government adopted the declaration at the UN Conference on Environment and Development (the Earth Summit) held in Rio de Janeiro in 1992.
Agrochemicals	Chemical substances used in agricultural production including fertilisers, herbicides, fungicides and insecticides.
Algae	Microscopic (sometimes larger) plants, which may be floating or attached. Algae occur in still and flowing water.
Algal blooms	Rapid growth of phytoplankton in marine and freshwaters which may colour the water and may accumulate on the surface as a green scum. Decomposing dead cells consume large quantities of oxygen in the water which may result in the waters becoming anaerobic. Some blooms (such as certain species of blue-green algae) may produce poisons.
Alleviation of Low Flows (ALF)	The strategy for resolving environmental problems (eg caused by over-abstraction) in certain catchments.
Alluvial Deposits	Sedimentary deposits resulting from the action of rivers. Typically fine grained material carried by the river and deposited in areas such as flood plains.
Ambient	Relating to the immediate surroundings eg ambient concentrations of pollutants, ambient temperature.

Ameliorate	Cause something to become better.
Ammonia	A chemical compound found in water often as a result of pollution by sewage effluents. It is widely used to determine water quality. Ammonia detrimentally affects fish.
AMP3	An acronym for the third Asset Management Plan produced by the Water Companies for the Office of Water Services (OFWAT). It sets out the water industry investment programme for the period 1995 to 2005.
Anaerobic	The absence of oxygen. Conditions suitable only for organisms which do not require free oxygen or air for respiration.
AOD (Above Ordnance Datum)	Land levels are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as 'Ordnance Datum'. Contours on Ordnance Survey maps of the UK show heights in metres above Ordnance Datum.
Aquatic	Pertaining to the water environment.
Aquifer	A water bearing-stratum situated below ground level. The water contained in aquifers is known as groundwater.
Artesian	Groundwater which reaches the surface under it's own pressure.
Artificial Recharge	The filling or recharging of an aquifer by means other than natural infiltration of precipitation and runoff (eg by use of treated river water).
Asellus	Water louse, a crustacean particularly susceptible to toxic substances.
Asset Management Plan	Water Companies' Strategic Business Plans - initiated (eg AMP 23 by OFWAT) as part of the periodic review of water company charges.
Atom	The smallest quantity of an element that can take part in a chemical reaction.
Attenuation	Breakdown or dilution of a contaminant in water.
Augmentation	The addition of water by artificial input. (Usually to "top up" low flows in summer by either groundwater pumping or via reservoir release.)
Avifauna	Birds.
Base Flow	The proportion of river flow that is provided by groundwater discharge from an aquifer.
Benthic	Referring to animal and plant life on the bed of a stream, lake or other water body.
Benzene	A carcinogenic organic compound found in petrol and emitted mainly from car exhausts.
Bioaccumulation	The accumulation by living organisms of materials from their surroundings such that the concentrations of these materials in the organisms are higher than in the surrounding medium.
Biochemical Oxygen Demand (BOD)	A standard test which measures over 5 days the amount of oxygen taken up by aerobic bacteria to oxidise organic (and some inorganic) matter.
Biodegradable	Capable of being decomposed by bacteria or other biological means.
Biodiversity	Diversity of biological life, the number of species present.
Biomass	Total quantity or weight of organisms in a given area or volume - e.g. fish biomass is measured as grammes per square metre (gm ²).
Biomass estimates	Measure of density usually expressed as grammes per square metre (g/m ²) or gm ² .
Biosphere	That part of the earth and atmosphere in which organisms live.
Bivalve	A twin-shelled mollusc.
Blue-Green Algae	Ubiquitous, usually microscopic plankton with properties characteristic of both bacteria and algae. In still, calm conditions they can grow to excess to form dense blooms and scums, and are known to produce chemicals toxic to mammals.
Borehole	Well sunk into a water bearing rock.
Breach	A failure of a flood defence.
Brundtland Report	Report of the 1987 World Commission on Environment and Development.

BS7750	British Standard covering the production and implementation of Environmental Management Systems.
Buffer Zone	Strip of land 10-100m wide, alongside rivers which is removed from intensive agricultural use and managed to provide appropriate habitat types.
Cadmium	A very toxic heavy metal with a wide variety of uses.
Calcareous	Of, or containing, carbonate of lime or sandstone.
Carbon Dioxide	Gas present in the atmosphere and formed during respiration, the decomposition and combustion of organic compounds (eg fossil fuels, wood etc). A greenhouse gas.
Carbon Tetrachloride	An organic solvent commonly used as a dry-cleaning agent.
Carr	Wet woodland usually composed of alder and willow.
Carrying Capacity	Size of a channel relating to the amount of water and the flow it can contain within its banks.
Catchment	The total area from which a single river system collects surface run-off.
CFCs	Chlorofluorocarbons. Volatile but inert (without active chemical or other properties) compounds of carbon and (mainly) chlorine and fluorine. Important greenhouse gases and ozone layer depleters.
Channel Morphology	The physical shape or form of river channels arising from hydrological processes, and from basin development at the catchment scale.
Chloroform	An organic solvent commonly used throughout industry.
Coarse Fish	Freshwater fish other than salmon and trout.
Coliform (Faecal Coliforms)	A group of bacteria distinguished by their ability to degrade lactose to produce acid and gas. They are used as indicators of possible contamination of water by sewage.
Combined Sewer Overflow (CSO)	An overflow structure which permits a discharge from the sewerage system during wet weather conditions, and consists of both foul and surface water discharge.
Compensation Flow	The flow in a watercourse, maintained below dams, to compensate for impounding.
Confined Aquifer	An aquifer which is overlain by rocks of low permeability so that the movement of water is restricted and the groundwater within the aquifer is confined under pressure. A confined aquifer is termed artesian when boreholes drilled into it overflow without being pumped.
Confluence	The point at which two rivers meet.
Conjunctive Use	Combined use of different sources of water (usually surface water and groundwater).
Consent (Discharge)	A statutory document issued by the NRA. It can authorise entry and indicate any limits and conditions on the discharge of an effluent to a Controlled Water. A land drainage consent is an approval for specified structural works in areas under NRA control.
Conservation Notice	Issued to ensure that water resources are not adversely affected by mineral, civil engineering, and other uses exempt under the Water Resources Act 1991.
Consumptive Use	Water which is abstracted but not returned to the catchment, either because it evaporates or is exported for use in another catchment.
Controlled Waste	Industrial, household and commercial waste, as defined in UK legislation. Controlled waste specifically excludes mine and quarry waste, wastes from premises used for agriculture, some sewage sludge and radioactive waste.
Controlled Waters	All rivers, canals, lakes, groundwaters, estuaries and coastal waters to three nautical miles from the shore, including the bed and channel which may for the time being be dry.
Countryside Stewardship Scheme	Scheme set up by the Countryside Commission in which land-owners are grant aided to manage their land in an environmentally sensitive manner.
Countryside Structure Plans	Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.
Critical Load	A quantitative estimate of exposure to pollutants below which no significant harmful environmental effects result.
Crown	The activities and properties owned by the Crown and Central Government are often exempt from the requirements of much of the legislation pertaining to the water environment. Exemption is

	likely to be removed under Environment Act.
Crude Sewage	Untreated sewage.
Cryptosporidium	A microscopic parasite which can cause disease in humans.
Culvert	Drain or covered channel carrying water across or under a road, canal etc.
Cumees	Cubic Metres per Second: equivalent to 86.4 thousand cubic metres per day.
Cyprinid fish	Coarse fish eg.Roach, Dace and Bream.
Dangerous Substances	Substances defined by the European Commission as in need of special control. This is because they are toxic, accumulate and concentrate in plants and animals, or do not easily break down into less dangerous substances. They are classified as List I or List II.
Demand	The requirement for water for human use.
Demand Centres	A generally discrete area of public water supply demand in which specific abstraction sites can be used to meet demand throughout that area.
Demand Management	Activities to manage the amount of water required from a source of supply; includes measures to control waste and/or to discourage use.
Derogate	Loss or impairment of a water resource, action causing such loss or impairment.
Derogation	A legal term that describes a diminution of the water rights of existing water users due to a new abstraction.
Determinand	A general name for a characteristic aspect of water quality. Usually a feature which can be described numerically as a result of scientific measurement.
De-watering	Removal of groundwater to reduce flow rate or diminish pressure.
Dichlorvos	A soluble organophosphorus insecticide which is used as a fumigant in crop protection and for controlling louse in the salmon farming industry.
Diffuse Pollution	Pollution without a single point source eg. acid rain, pesticides, urban run-off etc.
Diffuse Source	Pollution from non-point sources.
Dioxins	A group of 210 closely related chemicals which can be formed as by-products in some chemical processes and in various combustion processes such as waste incineration and coal burning.
Direct Re-use	Use of treated effluent from a sewage treatment plant directly as a source of water for another use, usually with further treatment.
Discharge capacity	The volume of water per unit of time able to be conveyed by a channel or pipe.
Discharge consent	See consent.
Dissolved Oxygen (DO)	The amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is an important, but highly variable, indicator of the 'health' of the water. It is used to classify waters.
Drought Order	Drought Orders are made by the Secretary of State upon application by the NRA or a water undertaker (Water Company), under powers conferred by Act of Parliament, to meet deficiencies in the supply of water due to exceptional shortages of rain.
Dry Weather Flow (Sewage Treatment Plants)	For sewage works, this is calculated by adding estimates of the domestic sewage discharge (which is the population multiplied by the per capita consumption) plus any industrial discharges plus infiltration into the sewer.
Dry Weather flow (River)	For the river, the Dry Weather Flow is taken to be what is known as the 95 percentile low flow (or Q95) which means the river is higher than Q95 for 95 percent of the time.
EC Directive	A type of legislation issued by the European Union which is binding on Member States in terms of the results to be achieved but which leaves to Member States the choice of methods.
EC Regulation	European Community legislation having legal force in all member states.
Ecology	The study of relationships between an organism and its environment.
Ecosystem	A functioning, interacting system composed of one or more living organisms and their effective environment, in biological, chemical and physical sense.

Effective Rainfall	Total rainfall minus direct evaporation and the water used by plants for transpiration. This is equivalent to the total resource of a catchment.
Effluent	Liquid waste from industry, agriculture or sewage treatment plants.
Effluent Re-use	The use of effluent treatment to appropriate standards for various uses from low grade (grey water) uses to potable supply. The term generally refers to indirect use of treated effluent - effluent mixed to a large degree with other raw water.
Emergency Overflow (EO)	Discharge of crude sewage from sewerage system because of mechanical or electrical breakdown of pumps.
Emergent Vegetation	Plants with roots in the river bed but which emerge from the water. Examples include reeds, iris and bulrush.
Environmental Indicator	A measure which can be used to assess the present state of the environment by looking at trends over time.
Environmental Quality Standard (EQS)	The concentration of a substance which must not be exceeded if a specific use of the aquatic environment is to be maintained.
Environmentally Sensitive Area (ESA)	An area where traditional farming methods may be supported by grant aid from the Ministry of Agriculture, Fisheries and Food (MAFF) to support distinctive landscape, wildlife habitats or historic features.
Ephemeral Flow	River flow which dries at some times of the year (eg winterbournes).
European Inland Fisheries Advisory Commission (EIFAC)	An agency of the United Nations Food & Agriculture Organisation (FAO).
Eutrophic	A description of water which is rich in nutrients. At worst, such waters are sometimes beset with unsightly growths of algae.
Evapotranspiration	Water lost by evaporation and water taken up and lost by plants.
Fauna	Animal life.
Field capacity	Maximum amount of water that can be retained in the soil following natural drainage.
Fish Biomass	A measure of the quality of a fishery as found in terms of surveys, weight by area ie g/m ² .
Fissure	A crack or open break in rocks.
Flash (or Flashy)	An upland river or river catchment area where rainfall moves rapidly from the land surface to the river, causing sudden high flows shortly after the peak rainfall event.
Flood Defences	Anything natural or artificial that protects against flooding, to a designed return period.
Floodplain	This includes all land adjacent to a watercourse over which water flows or would flow but for flood defences in times of flood.
Floodplain encroachment	Development on low-lying land adjacent to a river where water is naturally stored during flood conditions.
Flora	Plant life.
Flow Regime	The statistical pattern of a river's constantly varying (daily) flow rates.
Fluvial	Relating to the freshwater river.
Foreshore	The part of the shore that lies between the limits of high and low tides.
Forestry Authority (FA)	Advisory and Regulatory arm of the Forestry Commission.
Forestry Enterprise	The commercial arm of the Forestry Commission.
Freshwater Fish	For the purposes of the Salmon & Freshwater Fisheries Act 1975, fish other than Salmon, Brown Trout, Sea Trout, Rainbow Trout and Char.
Gammarus	Common freshwater Crustacean - common name Freshwater Shrimp.
Gauging Station	A site where the flow of a river is measured.
General Quality Assessment (GQA)	A new scheme replacing the NWC Classification system. It provides a means of assessing and reporting environmental water quality in a nationally consistent and objective way.

The chemical grades for rivers introduced in 1994 uses BOD, Ammonia and Dissolved Oxygen limits for water quality between A (Good) and F (Bad). Other grades for estuarine and coastal waters are being developed and aesthetic components will be measured and graded by a system under trial now.

Geomorphology	Scientific study of land forms and of the processes that formed them.
Glacial Deposits	Term used to describe all unconsolidated superficial deposits overlying solid rock left by glacial activity.
Global Warming	The increase in the average temperature of the earth, thought to be caused by the build up of greenhouse gases.
Gravity outfall	Discharge through a pipe or sluice with no pumping.
Green Belt	Any zone of countryside immediately adjacent to a town or city, defined for the purpose of restricting outward expansion of the urban area.
Groundwater	Water which saturates a porous soil or rock substratum (or aquifer). Water held in storage below ground level.
Groundwater Protection Policy	Agency policy which controls activities having the potential to pollute ground water resources.
Habitat	The customary and characteristic dwelling place of a species or community.
Heavy Metals	A loose term covering potentially toxic metals used in industrial processes.
Hectare	Unit of area 100m x 100m, equal to 2.471 acres.
Herbicide	Substance used to control weeds.
House Equivalents	System by which areas of land and property are allocated a value in terms of numbers of houses.
Hydraulic Continuity	The degree of interconnection between two potential sources of water, eg a river and an aquifer or two clearly defined aquifers.
Hydrocarbons	Compounds of hydrogen and carbon which react in the presence of sunlight and oxides of nitrogen to produce photochemical oxidants.
Hydrogeology	Branch of geology concerned with water within the Earth's crust.
Hydrology	The study of water on and below the earth's surface.
Hydrometric	The measurement of water.
Igneous	One of the three main groups of rock types. They are rocks that have crystallised from a magma (molten rock).
Impounded	The holding back of water behind a dam. Strictly a structure which raises water levels above their "normal" height. May need a licence and/or Land Drainage Consent from the NRA.
Impoundment Reservoir	Surface water storage area formed by construction of a dam and supplied only by natural inflow from the upstream catchment.
Integrated Pollution Control	An approach to pollution control in the UK which recognises the need to look at the environment as a whole, so that solutions to particular pollution problems take account of potential effects upon all environmental media.
Interceptor/Separator	A device for separating oil from water and containing it, which when used as part of a drainage system limits the amount of oil discharging to watercourses and to the ground from roads and garages etc.
Internal Drainage Boards (IDBs)	Authorities responsible for dealing with land drainage within a district. They are primarily concerned with agricultural land drainage but also may be involved with water supply to their district for agricultural purposes.
Intrusion	A body of rock, usually igneous, which is emplaced within pre-existing rocks.
Invertebrate fauna	Animals which lack a vertebral column - used for biological classification. Especially macro-invertebrates (animals of sufficient size to be retained in a net with a specified mesh size).
Integrated Pollution Control	A system of pollution control, administered by the Agency that applies to the most potentially polluting or technologically complex industrial and other processes in UK. IPC deals with releases of all media (air, land and water) and uses the principles of BATNEEC and BPEO.

IPC Authorisation	An authorisation issued by the Agency prescribed by the Environmental Protection Act 1990 covering certain operation of processes .
Isobyet	A line on a map joining places of equal rainfall amount.
Landfill	Site used for waste disposal into/onto land.
Leachate	Liquor formed by the act of leaching.
Macroinvertebrate	Animals without backbones eg leeches, snails worms, insects.
Macrophytes	Any plant observed by the naked eye and nearly always identifiable. This definition includes all higher aquatic plants, vascular cryptograms and bryophytes, together with groups of algae which can be seen to be composed predominantly of a single species.
Main River	The watercourse shown on the statutory 'Main River maps' held by NRA and MAFF. The NRA has permissive powers to carry out works of maintenance and improvement on these rivers.
Managed Retreat	The deliberate abandoning of an existing tidal defence in order to obtain economic and ecological advantage. A new defence may be constructed landward of the old line.
mAOD	A measure of altitude. Metres above ordnance datum.
Marginal Land	Typically land of poor quality for agricultural use, due to adverse soil, site or climate.
Mean Annual Flood	Mean of the annual peak discharges in the period of record.
Mean High Water Spring Tides (MHWS)	A datum level used in mapping.
Mercury	A very toxic heavy metal with a wide variety of uses.
Microbiology	The study of micro-organisms (eg bacteria, viruses).
Minimum Acceptable Flow (MAF)	The minimum acceptable flow as defined in Section 21 of the Water Resources Act 1991.
Minimum Maintained Flow (MMF)	The flow at a control point downstream of an intake on a regulated river that must be maintained at all times.
Minimum Residual Flow (MRF)	Target flow set locally and not legally defined.
Mitigation	Refers to the environmental impact of scheme development or operation and the actions which may be taken to reduce or ameliorate such impacts.
Models	Usually theoretical frameworks, often using computers, which use mathematical formulae to describe in a simplified way the complexity of the water environment.
Monoculture	Production of only one type of crop.
Morphology	The form of the structure of plants and animals.
National Nature Reserve (NNR)	An area of national importance for nature conservation.
Natural Flow Regime	The river flow pattern experienced prior to the influence of man, with no abstraction from or discharges to the catchment.
Nitrate Sensitive Areas (NSA)	An area where nitrate concentrations in sources of public drinking water exceed, or are at risk of exceeding the limit of 50 mg/l laid down in the 1980 EC Drinking Water Directive, and where voluntary, compensated agricultural measures were introduced in 1990 as a means of reducing those levels.
Nitrate Vulnerable Zone (NVZ)	An area where nitrate concentrations in sources of public drinking water exceed, or are at risk of exceeding the limit of 50 mg/l laid down in the 1991 EC Nitrate Directive, and where compulsory, un-compensated agricultural measures will be introduced from 1996 as a means of reducing those levels.
Non-Calcareous	Rock containing less than 30% calcium carbonate.
Noxious	Poisonous or harmful.
Nutrient	Substance providing nourishment for plants and animals eg nitrogen, phosphorus.
OFWAT	Office of Water Industry's Financial Regulator of Water Service Companies .

Organic	Generally any substance containing carbon as part of its chemical make-up.
Organochlorines	Any organic compound containing chlorine, for example PCBs and pesticides such as DDT and lindane.
Outage	A term used by the Water Companies to describe the loss of public water supply source yields due to planned or unplanned maintenance and the temporary loss of supply due to pollution.
Outfall	The point at which a river discharges to a downstream source eg estuary, sea; it may also include an outfall structure to prevent sea waters backing up the system.
Oxidation	Usually a chemical reaction with oxygen, producing oxides.
Oxide	Any compound of oxygen with another element.
Particulates	Fine solid particles found in the air or in emissions.
Pathogen	A substances or organism that causes disease.
PCBs	Polychlorinated biphenyls, a group of widely used compounds containing chlorine.
Perennial Flow	River flow present through the entire year.
Permeability	The ease at which liquids (or gases) can pass through rocks or a layer of soil.
Permissive powers	Powers which confer on the NRA the right to do things but not the duty to do them.
persons/km²	Number of people per square kilometre
Pesticides	Substances used to kill pests, weeds, insects, fungi, rodents etc.
pH	Quantitative expression of acidity or alkalinity of a solution.
Phenols	A class of aromatic compounds with one or more hydroxyl (-OH) groups directly attached to the benzene nucleus.
Photosynthesis	Process in which energy of sunlight is used by green plants to build up complex substances from Carbon Dioxide and water with the release of Oxygen.
Physical Habitat Simulation System (PHABSIM)	A suite of computer programmes used for the specification of ecologically acceptable flows.
Piezometers	An observation well designed to measure the elevation of the water-table at a particular level.
Piscivorous	Fish eating. (eg birds such as cormorants)
Plankton	The single celled and simple organisms which form the basic resource of the water environment food chain.
Polychlorinated biphenyls (PCB)	A group of widely used compounds containing chlorine. PCBs can accumulate in food chains and at high concentrations are thought likely to produce harmful side effects, particularly during the reproductive cycle of some marine mammals.
Porosity	The volume of water which can be held within a rock or soil, expressed as the ratio of the volume of the voids to the total volume of the material.
Potable Water	Water of a suitable quality for drinking.
Precipitation	Deposition of moisture including dew, hail, rain, sleet and snow.
Prescribed Flow	A flow set to protect lawful downstream users and the aquatic environment.
Prescribed Process	Under IPC, processes described in regulations, that are the most potentially polluting or technologically complex industrial and other.
Prescribed Substance	Under IPC, a potentially polluting or harmful substance discharges which should be prevented, minimised or rendered harmless.
Prime Sites	Sites of importance for nature conservation, designated by County Wildlife Trusts and in some cases English Nature and Local Authorities. Non statutory.
Private Water Undertaking	Supply of water by an individual or company other than a Water Undertaker.
Prohibition Notice	A legal notice that can be issued by the NRA to (1) prevent a discharge occurring (2) require a consent application to be made or (3) allow a discharge subject to certain conditions.

Public Water Supply	The supply of water by companies appointed as Water Undertakers by the Secretary of State for the Environment under the Water Industry Act 1991.
Putrescible Waste	Solid waste which will produce leachate when chemically and or biologically degraded.
Q95	The flow of a river which is exceeded on average for 95% of the time.
RAMSAR	Wetland site of International Importance that is designated under the Ramsar* convention (*a town in Iran where the international convention originally agreed in 1975 to stem the progressive encroachment on, and loss of, wetland).
Raw Water	Water in its natural state; before treatment.
Raw Water Transfer	The transfer of water from one resource to another in order to meet or anticipate demand. It is usually part of a scheme such as a reservoir or pipeline.
Reach	A length of a river.
Recharge	Water which percolates downwards from the surface into groundwater aquifers.
Red Data Book Species	The most threatened species in Great Britain.
Red List Substance	Substance which has been selected for monitoring on the basis of its persistency toxicity and ability to bioaccumulate.
Regulated River	A river where the flow is augmented through the addition of water from another source.
Remote-sensing Scanner	Formally called a Compact Airborne Spectral Imager, this instrument senses and records 288 bands of reflected water colour, for later comparison to results of water quality samples.
Renewable Energy	Energy produced from resources which are unlimited or rapidly replenished eg. wind, water, sunlight, wave power or waste.
Return Period	Refers to the frequency of a rainfall or flooding event. Flood events are described in terms of the frequency at which, on average, a certain severity of flow is exceeded. This frequency is usually expressed as a return period in years, eg. 1 in 50 years.
Revocation Notice	A legal notice issued by the Agency to cancel a discharge consent.
Riffle	A shallow area in a river where the substrate is composed of gravel and the flow is faster.
Riparian	Of, or on, land contiguous to the river.
Riparian Owner	Owner of riverbank and/or land adjacent to a river. Normally owns riverbed and rights to midline of channel.
Rising Groundwater	Resulting in some locations from the natural recovery of an aquifer following a reduction in groundwater abstraction.
River Corridor	The continuous area of river, river banks and immediately adjacent land alongside a river and its tributaries.
River Habitat Survey (RHS)	An inventory survey of physical features of the river and adjacent habitat.
River Quality Objectives (RQO)	The level of water quality that a river should achieve, in order to be suitable for its agreed use. Is being replaced by Water Quality Objectives (WQO's).
Salmonella	These are anaerobic rod shaped bacteria of the Enterobacteriace family. All members of the genus <i>Salmonella</i> are intestinal animal pathogens. <i>Salmonella typhi</i> and to a lesser extent <i>Salmonella paratyphi</i> are primarily human pathogens. They are well adapted to water as a mode of transmission and cause typhoid and paratyphoid respectively.
Salmonid Fish	Game fish eg. trout and salmon.
Scheduled Ancient Monument (SAM)	The key sites nationally for archaeology, designated by the Secretary of State for National Heritage, through English Heritage.
Secondary Treatment	Biological degradation of effluent which has already received Primary Treatment. the process may also involve some chemical and physical treatment.
Self/Natural Purification	Organic polluting load discharged into a water body is gradually "treated" due to the activities of micro-organisms. This self-purification requires sufficient concentrations of oxygen.
Septic tank	A tank used for the treatment of sewage from properties without mains drainage. The sewage is settled and some bacterial treatment occurs. Discharge of effluent is usually to a soakaway system.

Set-Aside	The EC set-aside scheme was first introduced for the crop year 1991/92 as part of the Common Agricultural Policy reform to allow farmers to remove land from production by receiving compensation. Eligible crops are a wide range of arable crops, principally cereals.
Sewage	Liquid waste from cities, towns and villages which is normally collected and conveyed in sewers for treatment and/or discharge to the environment.
Sewerage	System of sewers usually used to transport sewage to a sewage treatment works.
Silage	A winter feed for cattle. Silage is produced throughout the summer by bacterial action on freshly cut grass or other crops stored in silos.
Siltation	At low velocities water will deposit the material being carried in suspension. The slower the velocity the finer the material deposited. A deposit of clays and silt is very difficult to remove naturally as it requires turbulent and high velocities.
Site of Special Scientific Interest (SSSI)	A site given a statutory designation by English Nature or the Countryside Council for Wales because it is particularly important, on account of its nature conservation value.
Sludge	The accumulation of solids from treatment processes. Sludge can be incinerated or spread on farm land.
Slurry	Animal waste in liquid form.
Soakaway	System for allowing water or effluent to soak into ground, commonly used in conjunction with septic tanks.
Soft Option	Measures such as beach recharge which do not require walls and expansive structures to protect against flooding. They are soft because they absorb the energy of the waves and thus require continual maintenance.
Soil Moisture Deficit	The drying out of soil, occurring when the loss of water by evapotranspiration is greater than rainfall.
Source Protection Zones	A Source Protection Zone (SPZ) is the area over which recharge is captured by an abstraction borehole. SPZs are designated by the NRA and are delineated to protect potable water supplies against the polluting effects of human activity.
Sparte	A sudden increase in water quantity, such as a flood, causing a river to be in a swollen fast-flowing condition.
Special Protection Area (SPA)	Statutory protected habitats for wild birds under EC Regulations.
Spray Irrigation	The watering of crops by spraying. Can have a high impact on water resources.
Springs	Natural emergence of groundwater at the surface.
Statutory Consultee	In both the NRA's and other agencies' legislation there are requirements for consultation. Comments and objections which are received are noted but do not usually have the power to, in themselves, prevent the controlling authority from making a decision. An exception to this is where the NRA is a Statutory Consultee for IPC where the NRA's requirements would be taken as the minimal acceptable.
Statutory Powers	Powers conferred (eg on the NRA) where it has a duty to do things.
Statutory Water Quality Objectives (SWQO)	Methods of classifying waters and targets for individual waters that have been given statutory force through the issue of Regulations by the Secretary of State under the WaterResources Act 1991.
Storm Sewage Discharges	The discharge of untreated sewage in times of heavy rainfall and high flows.
Strata	A term applied to rocks that form layers or beds. Can also be applied to successive layers of any deposited substance eg. atmosphere, biological tissue.
Substrate	The base material, usually a rock or deposit, upon which a habitat is formed.
Surface Water	Water collecting on and running off the surface of the ground.
Suspended Solids	The density of undissolved matter which is held by a water body. It will vary with the turbulence and velocity of the water.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
Sustainable Management	The interpretation of the principles of sustainable development at a local/regional level within the

boundaries of national and international political, economic and environmental decisions.

S105 Surveys	Section 105 of the Water Resources Act 1991 allows for Standards of Service, Assets and Flood Risk Surveys.
Taxa	Groups of similarly classified animals and plants.
Telemetry	A means of directly collecting data from remote sites.
Terrestrial Habitats	Land based habitats such as river banks which are affected or interact with the water environment.
Tetrachloroethylene	A chlorinated organic solvent commonly used as a dry-cleaning agent.
THMs	Trihalomethanes are compounds consisting of one carbon atom, one hydrogen atom and three halogen (eg fluorine, chlorine, bromine or iodine) atoms, some of which are formed during chlorination of water. Trichloromethane (chloroform) occurs most frequently in water supplies.
Topography	Physical features of a geographical area.
Total Treated Water Losses	The sum of the loss of water from company distribution systems (trunk mains and distribution losses), customer supply pipes and general domestic leakage.
Trace Elements	Elements which occur in minute quantities as natural constituents of living organisms and tissues. They are however, generally harmful in large quantities. Trace elements include lead, silver, cobalt, iron, zinc, nickel, selenium and manganese.
Trade Effluent	Effluent derived from a commercial process/premises.
Transfer Station	A place where refuse, collected from premises, is compacted into large containers and transported onward for disposal.
Transmissivity (T)	The rate at which water moves through a unit depth of aquifer at a given gradient. It can be defined by: $T = k \times b$, where k = hydraulic conductivity (speed of water movement in soil expressed in metres per day), and b = saturated aquifer thickness.
Transpiration	Loss of water through evaporation by plants.
Trichlorobenzene	A chlorinated organic solvent.
Trichloroethylene	A chlorinated organic solvent used as a dry-cleaning agent.
Turbidity	Measure of the light scattering properties of the water caused by suspended matter.
Two stage channel (with low level berm)	A deeper channel for normal flows with a higher channel, formed by a low level berm, for flood flows.
Unconfined Aquifer	An aquifer in which the groundwater forms a free water table within the porous rock.
Underground Strata	A term used to signify geology under the surface soil layer. If groundwater exists, or if water is being discharged to the ground, the geology underneath the soil layer is known in the various Acts of Parliament as 'underground strata'.
Upper Tier	An absolute limit (generally based on a multiplication of the 95%ile limit) set in discharge consents. Mainly used on Water Service Companies Sewage Treatment Works.
Velocity	The speed of movement of water past a point. Velocity is measured in metres per second (m/sec).
Washlands	Extensive semi-natural area of flood plain adjacent to a river, where water is stored in time of flood. Structures can be added to control the amount of water stored in the washland and time its release to alleviate peak flood flows in areas downstream.
Watercourse	A stream, river, canal or channel along which water flows.
Water Delivered	The quantity of water at the point of delivery to customers, including measured/unmeasured commercial and household uses. Water delivered to households includes losses on the customers' premises (eg supply pipe, losses, leaking valves etc.)
Water Resource	The naturally replenished flow or recharge of water in rivers or aquifers.
Water Table	Top surface of the saturated zone within the aquifer.
Water Transfer Scheme	An infrastructure provided to transfer water from one river system to another.
Weir	A dam built across a river to raise upstream levels.

Wetland	An area of low lying land where the water table is at or near the surface for most of the time, leading to characteristic habitats.
Willow Croya	Bundles of willow stakes used to alter the velocity, halt bank erosion and increase upstream habitat diversity.
Winter Storage Reservoir	Reservoirs built by farmers to store water during the winter months when it is "plentiful" for re-use during the summer.
Yield	The reliable rate at which water can be drawn from a water resource.
Zooplankton	Animal organisms consisting mainly of small crustaceans and fish larvae. the animal constituent of plankton.
1-2 dichloroethane	A chlorinated solvent used as a de-greasing agent.
1:10 Year Drought/Flood	A drought/flood event with a statistical probability of occurring once in a ten year period (other periods may be specified in a similar way).
95%ile Limit	A numerical limit, specified in a discharge consent, which must be achieved or bettered for at least 95% of a specified time period.

MANAGEMENT AND CONTACTS:

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

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

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

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

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