

local environment agency plan

DOVE

ENVIRONMENTAL OVERVIEW
AUGUST 1999



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Foreword

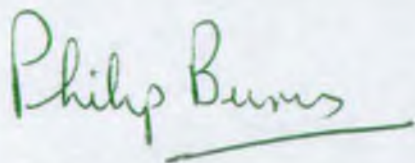
I am delighted to introduce the Consultation Draft for the Dove Local Environment Agency Plan. This is the third LEAP to be produced in the Upper Trent Area of the Midlands Region and looks at environmental issues within the River Dove catchment.

The Agency in consultation with key organisations has identified a number of environmental issues relevant to this area. We need to confirm that we have addressed all current issues and the options to resolve them, taking into account the often conflicting demands on the environment by its users.

The LEAP process will provide a vision for the environmental needs of the River Dove area. It will provide a framework within which we can seek to develop new partnerships with organisations and bodies with whom we wish to share a common approach on environmental issues.

This report is published as part of our commitment to being open and consulting with others about our work. This will be part of a major consultation exercise and marks the start of a three month period of consultation. Following the consultation period the Agency will produce a five year action plan which will set out a costed programme of work by the Agency and other organisations. Annual reviews over the five year period will report on significant achievements and progress being made on the issues.

Your views are extremely important. Only by letting us know your opinions will we be able to make a real difference to your local environment. I look forward to hearing from you.



Philip Burns
Area Manager
Upper Trent Area
Midlands Region
Environment Agency



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This document provides an overview of the environment of the Dove catchment. It brings together and examines information on the various pressures on the local environment and its consequent state. The Environmental Overview supports the Draft Dove Local Environment Agency Plan (LEAP) which was launched for public consultation on 4 May 1999. The LEAP identifies issues that arise as a result of the pressures and proposes actions to help resolve these.

Measuring the state of the environment is a fundamental aspect of the Environment Agency's work. In order to provide a structural way of monitoring and assessing the state of the environment the Agency has developed a framework of six basic Viewpoints which reflect the different possible ways of looking at the environment. These are described in Section 2 as:

- Land use and environmental resources
- Biological populations, communities and biodiversity
- Compliance with standards, targets and classification schemes
- The health of environmental resources
- Environmental change at long term reference sites
- The aesthetic quality of the environment

The Viewpoints framework provides the means of identifying the basic questions that need to be answered and can be used as a tool to help assess the rate of progress towards achieving the objective of sustainable development. It aims to improve the overall integration of the activities of organisations with environmental monitoring responsibilities. The framework provides the basis for assessing priorities for action and charting progress of environmental management plans and targets, and producing information on the environment for all of those who have an interest in it.

The pressures on the environment can be thought of as different sets of stresses, and the manner in which they affect the state of the environment as causing different strains upon it. The pressures themselves arise from both natural forces and from human influences. The aims of the Stresses and Strains framework is to allow the Agency to assess and analyse the extent and magnitude of the pressures and their impacts. This will help the Agency to prioritise and manage the stress more effectively.

In this overview, pressures on the environment are described in Section 3 as:-

- Natural forces
- Societal influences
- Abstractions and removals
- Usage, releases and discharges
- Waste arisings and disposal
- Illegal practices

CONTENTS	Page No.
1.0 INTRODUCTION	i
2.0 DOVE VIEWPOINTS	1
2.1 LAND USE AND ENVIRONMENTAL RESOURCES	2
2.1.1 Administrative areas and land use planning	2
2.1.2 Geology and topography	5
2.1.3 Climate and air quality	6
2.1.4 Agriculture	7
2.1.5 Industry	11
2.1.6 Minerals	11
2.1.7 Contaminated land	12
2.1.8 Catchments and flood defence	13
2.1.9 Water resources	16
2.1.10 Conservation, landscape and heritage resources	19
2.2 THE STATUS OF KEY BIOLOGICAL POPULATIONS, COMMUNITIES AND DIVERSITY	26
2.2.1 Biodiversity Action Plans	26
2.2.2 Habitats	27
2.2.3 Species	28
2.2.4 Fisheries	31
2.2.5 Invasive species	32
2.2.6 Indicator species	33
2.2.7 River Habitat surveys	34
2.3 COMPLIANCE WITH ENVIRONMENTAL QUALITY STANDARDS, TARGETS AND POLICIES/STRATEGIES	35
2.3.1 Air quality standards	35
2.3.2 Process Industries Regulation (PIR)	38
2.3.3 Radioactive substances regulation	40
2.3.4 Waste management and regulation	40
2.3.5 European water quality Directives	42
2.3.6 UK water quality objectives	45
2.3.7 Water resources objectives and standards	51
2.3.8 Flood defence standards of service	55
2.3.9 Flood warning standards of service	56
2.3.10 Nature conservation standards	57
2.4 HEALTH OF THE ENVIRONMENT	58
2.4.1 Introduction	58
2.4.2 Air ozone	59
2.4.3 Natural radiation	60
2.4.4 Acidification	60
2.4.5 Water	61
2.4.6 Alder disease	62
2.5 LONG TERM REFERENCE SITES	64
2.5.1 Air quality monitoring	64

2.5.2	Environmental change network	64
2.5.3	Harmonised monitoring sites	65
2.6	AESTHETIC QUALITY	66
2.6.1	Introduction	66
2.6.2	Tranquil areas	66
2.6.3	Landscape assessments	67
2.6.4	Litter	68
3.0	DOVE STRESSES AND STRAINS	69
3.1	NATURAL FORCES	70
3.1.1	Climate change	70
3.1.2	Flooding	71
3.2	SOCIETAL INFLUENCES	72
3.2.1	Population	72
3.2.2	Households	72
3.2.3	Development pressures	75
3.2.4	Surface water management	76
3.2.5	Water demand management	77
3.2.6	Transport	77
3.2.7	Energy	80
3.2.8	Heavy industrial processes	82
3.2.9	Recreation	82
3.3	ABSTRACTIONS AND REMOVALS	83
3.3.1	Minerals	83
3.3.2	Water abstraction	83
3.4	USAGE, RELEASES AND DISCHARGES	85
3.4.1	Industrial emissions	85
3.4.2	AMP3 and the National Environment Programme	86
3.4.3	Intermittent and diffuse pollution	87
3.4.4	Integrated pollution control	88
3.4.5	Consented discharges to water	89
3.4.6	Pesticides	90
3.5	WASTE ARISING AND DISPOSAL	93
3.5.1	Management of wastes	93
3.5.2	Waste arisings	93
3.5.3	Waste management facilities	95
3.5.4	Recovery	97
3.6	ILLEGAL PRACTICES	97
3.6.1	Pollution incidents	97
3.6.2	Fly tipping	102
3.6.3	Fish kills	102
3.6.4	Unlicensed waste sites	102

4.0 CONCLUSIONS

Table 1	Administrative details	2
Table 2	Agricultural land classification	9
Table 3	Holdings by EC farm type	9
Table 4	Agricultural land use	10
Table 5	Minerals	11
Table 6	Abstraction licences by subcatchment	16
Table 7	Indicator species in the Dove catchment	33
Table 8	Limits and Objectives: National Air quality Strategy	37
Table 9	IPC Authorised sites	39
Table 10	Rivers ecosystem classification	45
Table 11	GQA scheme classification	46
Table 12	Length of river in GQA grade	46
Table 13	River stretch quality	47
Table 14	Water resource obligations	54
Table 15	Flood defence standards of service	56
Table 16	Flood warning classification	57
Table 17	Area of tranquility (Sq Km)	67
Table 18	% of area which is tranquil	67
Table 19	Average size of tranquil area (Sq km)	67
Table 20	Population statistics	72
Table 21	Housing figures	73
Table 22	Development plans	76
Table 23	Contribution from road transport to UK emissions	78
Table 24	Delivered energy, 1995	80
Table 25	Energy use by sector, 1995	80
Table 26	IPC Authorisations by industry sector	89
Table 27	Pesticide use	91
Table 28	Waste arisings	93
Table 29	Waste management facilities	96
Table 30	Landfill sites	96
Table 31	Water pollution incidents by source (1997)	98
Table 32	Water pollution incidents by type (1997)	100
Map 1a	Local Administration	
Map 1b	LEAP Location	
Map 2	Geology	
Map 3	Topography	
Map 4	Rainfall	
Maps 5a-i	Air Quality Pollutants	
Map 6	Agricultural land classification	
Map 7	Holdings by EC farm type	
Map 8a-b	Landcover	
Map 9	Flood risk areas	
Map 10	Groundwater management areas	
Map 11	Countryside character areas	
Map 12	Protected areas	
Map 13	National Trust Property	
Map 14	Air quality – CO	

Map 15	Air quality – SO ₂	
Map 16	Air quality – NO _x	
Map 17	Air quality – VOC's	
Map 18	Air quality – PM10's	
Map 19	Chemical river quality	
Map 20	Biological river quality	
Map 21	Groundwater vulnerability	
Map 22	Radon	
Map 23	Tranquil areas – East Midlands	
Map 24	Tranquil areas – West Midlands	

Figure 1	Agricultural land classification	
Figure 2	Holdings by EC farm type	
Figure 3	Alder distribution	63
Figure 4	Harmonised monitoring site – N Oxidised (mg/l)	65
Figure 5	Harmonised monitoring site – Organophosphate (mg/l)	65
Photograph 1	Alder disease	62

2.0 Introduction

The framework for measuring the state of the environment has been derived from the Agency publication "*Viewpoints on the Environment*". This has identified six viewpoints from which the Agency monitors the environment:

- **Land use and environmental resources**, which looks at the quantity of environmental resources available, including land use and water resources, together with changes to these over time and the depletion of non-renewable resources.
- **Key biological populations, communities and biodiversity**, which looks at the variety of life that exists and considers the number and extent of key indicator species.
- **Compliance with environmental standards and targets**, which looks at compliance with standards set by EC Directives, national legislation, international agreements and classification schemes.
- **The health of the environment**, which concentrates on specific issues of concern in relation to the health of environmental resources. This includes issues such as eutrophication, acidification, hormone disruption and environmental toxicology, and interfaces with human health.
- **Long term reference sites**, which looks at the available data sets and considers integrated information on long-term trends at specific sites.
- **Aesthetic quality of the environment**, which considers issues such as landscape, light pollution, litter and odour. These are often new and subjective ways of looking at the environment but relate to the issues deemed most important by the public.

2.1 Land Use and Environmental Resources

2.1.1 Administrative Areas & Land Use Planning

2.1.1.1 Administration

Local administration for the Dove catchment is shared between two county councils, five district councils and the Peak District National Park Authority. The Peak District National Park Authority controls development on land within the Peak District National Park. These are listed in table 1 below and shown on Map 1a.

Table 1- Administrative Details

Local administration in the plan area		
County Councils	National Authority	District/Borough Councils
Derbyshire Staffordshire	Peak District National Park Authority	High Peak District Council Derbyshire Dales District Council South Derbyshire District Council Staffordshire Moorlands District Council East Staffordshire Borough Council

The boundary of the Dove catchment is based on the natural river catchments and ensures geographic/area continuity of the essential activities carried out in the planning and management of the Agency's Flood Defence, Water Resources and Environment Protection functions. Some information however, has been gathered on an administrative boundary basis by predecessor organisations or is held in such a format by partner organisations (e.g. Local Authorities) and was not necessarily available or applicable to geographic catchments. Therefore, a degree of approximation and judgement has had to be exercised. The location of the Dove LEAP within the Midlands Region of the Agency is shown in Map 1b.

2.1.1.2 Land Use Planning

The planning of the Agency's activities and actions in the Dove LEAP area has to be related to development planning by Local Planning Authorities (LPAs). The Agency is consulted by LPAs in the preparation of development plans and on certain types of planning applications on a case-by-case basis; LPAs are required to consult the Agency on certain planning applications, whereas for others, formal consultation is at the discretion of LPAs. The Agency has produced guidance on ensuring good liaison with and consultation by LPAs.

The high quality of the natural and man-made environment of the Dove catchment is an asset to be conserved. As such, it is a major constraint to development. This calls for positive conservation policies coupled with development strategies which encourage "Sustainable Development". Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

When considering planning applications for all forms of development, wherever potentially relevant, the LPAs must have regard to:

- Wildlife, ecological and geological interests, these include;
 - Sites of special scientific interest (SSSI's)
 - Local nature reserves
 - Special areas of conservation
 - Sites of countywide importance
- Habitat management
- Species protected by law
- Protection of the landscape e.g. special landscape areas
- Protection of important undeveloped land
- Protection of other landscape features e.g. river corridors
- Protection of archaeological sites and features
- Protection of best quality agricultural land
- Conservation of historic parks and gardens
- Listed buildings

Much of the Dove catchment lies within the Peak District National Park. One of the primary purposes of the National Park is to protect some of the country's wildest and most beautiful landscapes. If these special qualities are to be protected, careful control needs to be exercised over potentially harmful development not only within the National Park boundary but also on land which is conspicuous from within the Park.

Local plans and the requirements of the Derbyshire and Staffordshire Structure plans will have provided an additional 3,700 dwellings between 1991 and 2001. Housing development will be concentrated around Cheadle, with around 550 new dwellings proposed for the town by 2001, and Ashbourne. Other smaller developments are proposed for Uttoxeter, Rolleston, Hilton and Rocester. Proposed development land for commercial activity is also concentrated around Cheadle and Ashbourne.

Major road improvements have been undertaken in the catchment, with the recent completion of the A50 trunk road which follows the route of the River Tean and the lower reaches of the River Dove. The Doveridge bypass and A518 Uttoxeter bypass have also recently been completed. Other proposed road schemes include the Alton and Denstone relief road and A521 / 522 Cheadle inner bypass.

Approximately 40% of the catchment now benefits from designation by the European Union as eligible for Objective 5B assistance. This results in EU funding being available to assist in the development of the rural economy. Matched funding (up to 50%) can be used to support economic and business development, farm diversification, infrastructure, tourism and environmental enhancement. Future European funding is likely to be focussed through the new Regional Development Agencies.



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- Dove Boundary
- Urban Areas
- RailWays
- Local Authorities
- DERBYSHIRE DALES DISTRICT
- EAST STAFFORDSHIRE DISTRICT
- HIGH PEAK DISTRICT
- SOUTH DERBYSHIRE DISTRICT
- STAFFORDSHIRE MOORLANDS DISTRICT



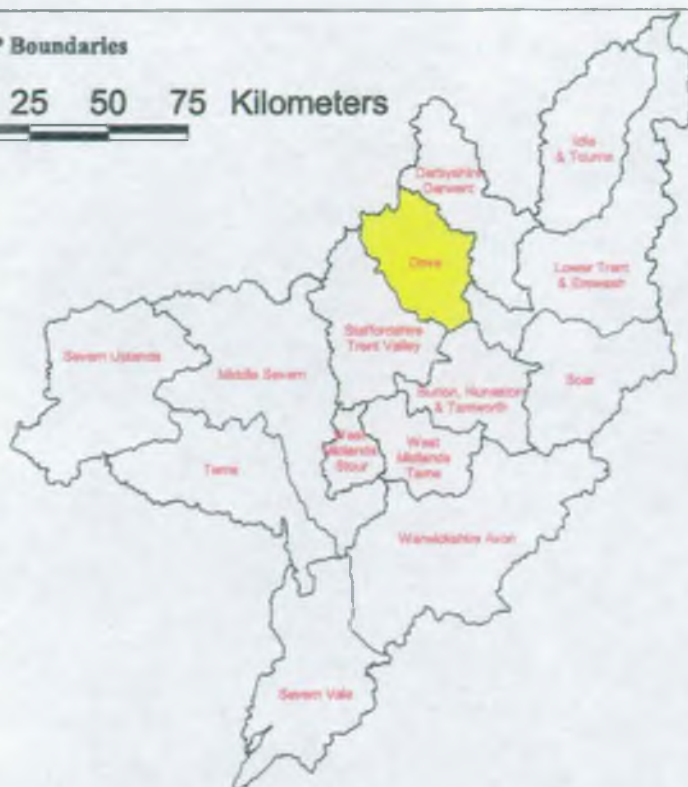


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LEAP Boundaries

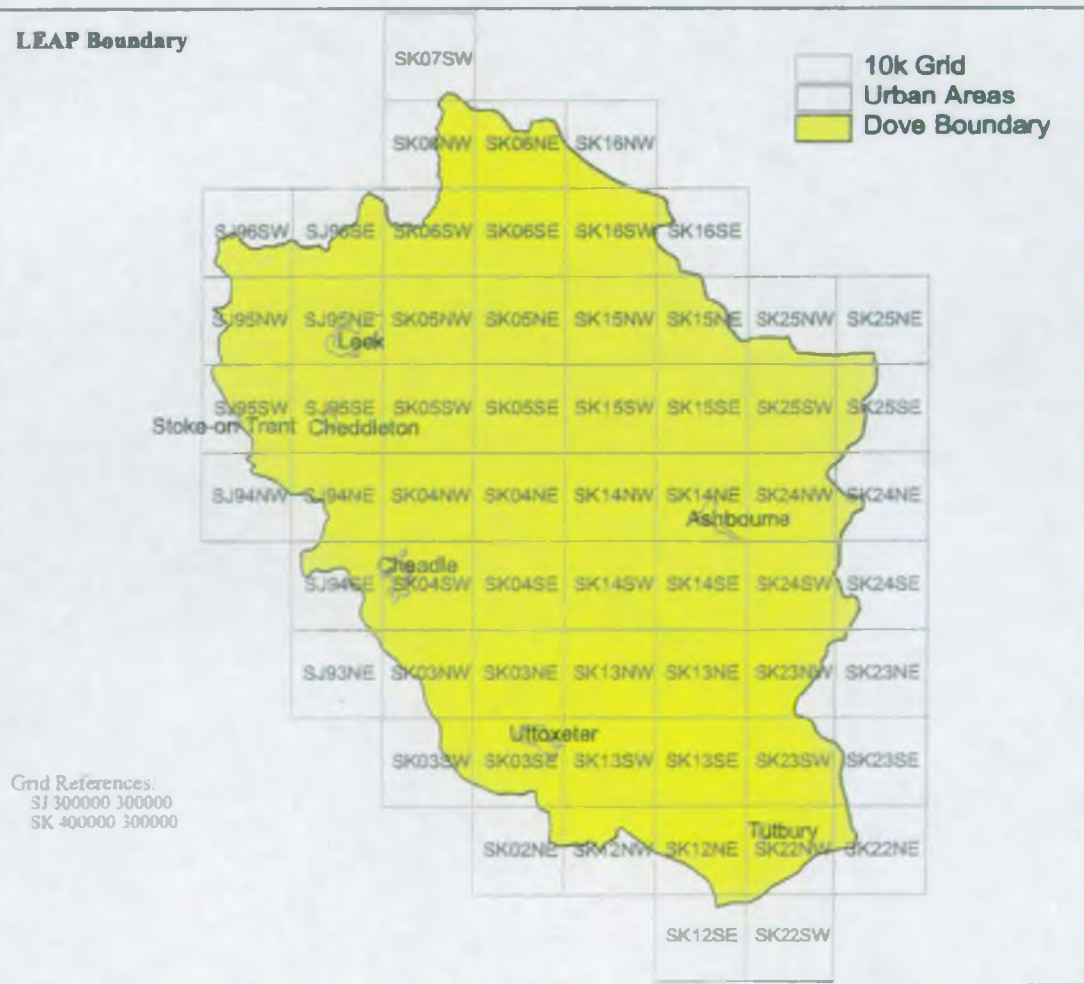
25 50 75 Kilometers



Environment Agency Regions

0 5 10 15 20 Kilometers

LEAP Boundary



2.1.1.3 Regional Development Agencies

Regional Development Agencies were formed on 1 April 1999 to:

- Further the economic development and regeneration of its area
- To promote business efficiency, investment and competitiveness in its area
- To promote employment in its area
- To enhance the development and application of skills relevant to employment in its area
- To contribute to the achievement of sustainable development in the United Kingdom where it is relevant to its area to do so

The Regional Development Agencies Act 1998 states explicitly that the RDA's purpose should apply as much in relation to the rural parts of its area as in relation to the non-rural parts of its area.

The Dove Catchment is covered by two Regional Development Agencies, the West Midlands RDA covers Staffordshire and the East Midlands RDA covers Derbyshire.

West Midlands – Advantage West Midlands, this is the RDA for the UK's manufacturing commercial and rural heartland. It brings together a wealth of experience and expertise to promote the West Midlands distinctive competitive advantage and work with the regions many diverse communities towards a new-era of opportunity and accelerated growth.

East Midlands Regional Development Agency, this Agencies brief includes job creation, skills improvement, increasing competitiveness and attacking social exclusion.

2.1.2 Geology and Topography

The geology of the catchment can be sub-divided into three distinctive areas. Within each, the underlying rocks exert a controlling influence on the local landscape and the interaction between ground and surface waters.

The northern half of the catchment is dominated by Carboniferous Limestones and Namurian Gritstones. These are the oldest exposed rocks in the area, outcropping to form the uplands of the Staffordshire Moorlands and Derbyshire Peak District. A localised area of coal measures strata also occurs around Cheadle, east of Stoke on Trent. Much of the southern half of the catchment is underlain by mudstones and marls of Triassic age. These give rise to an area of lower, more uniform relief. Between these two contrasting areas lies a narrow central belt of Triassic Sandstones, extending from around Cheadle in the west towards Ashbourne in the east. A further outcrop occurs west of Leek in the Churnet Valley. The Geology of the catchment is shown on Map 2.

The topography of the catchment is dominated by the southern extremity of the Pennines and drainage is generally in a southern and eastern direction. The upland valleys tend to be narrow and deep. The lower reaches of the River Dove meander across a wide floodplain before its confluence with the River Trent.

The River Dove rises on the southern side of Axe Edge approximately 3 miles (5Km) south west of Buxton. The river flows from a height approximately 550m to 50m above sea level where it joins the River Trent. The Churnet rises north of Leek and to the east of The Roaches at a height of 450m above sea level. From Tittesworth Reservoir it flows around Leek and through the Churnet Valley. The hills rise above the wooded valley and provide a landscape of high quality.

At Rocester the River Churnet joins the River Dove and the landscape opens out into a broad floodplain. The lower Dove valley is flanked on its southern side by the Needwood Forest, with Marchington Cliff being a major topographical feature. The topography of the catchment is shown on Map 3.

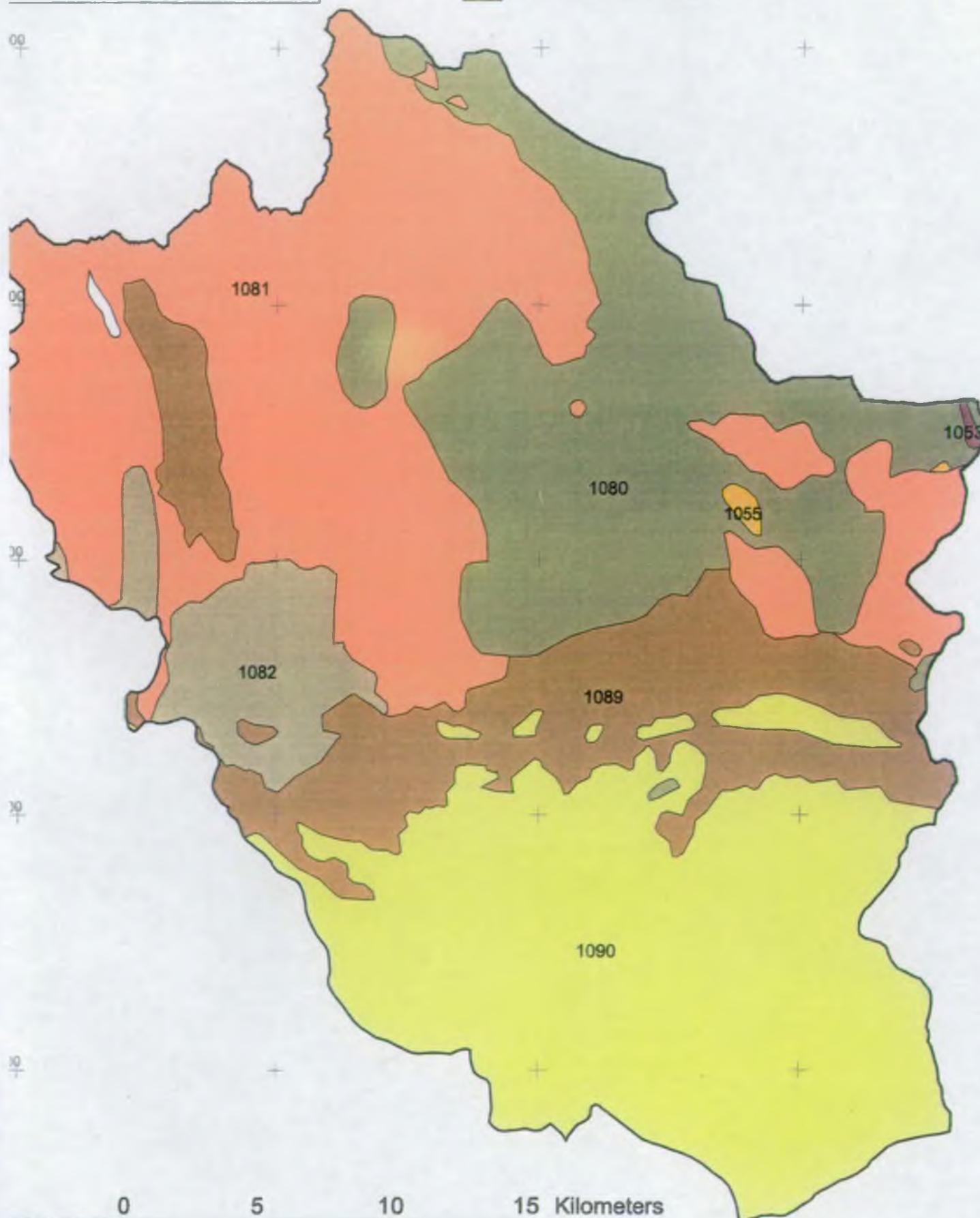
Dove
Local Environment Agency Plan
Map 2 : Solid Geology



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- Dove Boundary
- Solid Geology
- 1053 Basalt & Spillite
- 1055 Tuff & Agglomerate
- 1080 Tournaisian & Visean
- 1081 Namurian
- 1082 Lower Westphalian
- 1089 Permian & Triassic Sandstones
- 1090 Triassic Mudstones



2.1.3 Climate and Air Quality

2.1.3.1 Climate

The climate of the plan area is influenced by its location to the Peak District and the varying topography. The wind direction is typical for the UK with prevailing south westerly winds and dominant north easterlies.

2.1.3.2 Rainfall

The average annual rainfall for the Dove catchment is 936mm, this is higher than the annual average for England of 836mm. The rainfall for the area is shown on Map 4.

2.1.3.3 Evapotranspiration and Soil Moisture Deficit

Evapotranspiration is the process whereby water is lost as vapour to the atmosphere from open water surfaces and as transpiration from vegetation. A small but important proportion is also lost during the summer months from areas of bare soil and wherever the water table is at a relatively shallow depth. The average annual potential evapotranspiration rate is 589mm and average actual evapo-transpiration rate being 537mm for the area.

Soil Moisture Deficit is a measurement of the quantity of water the soil is capable of absorbing before saturation and run-off occurs. The average Soil Moisture Deficit for the area is 405mm.

2.1.3.4 Air quality

Air pollution can adversely affect human health, ecosystems and vegetation, as well as deterioration of buildings and materials. Air pollution is not just a local issue and many air pollution and air quality issues are regional or global. Ozone-depletion in the upper atmosphere, or stratosphere, is a consequence of the transport of certain chemicals, particularly compounds such as chlorofluorocarbons (CFCs), from human activities. Depletion of the ozone layer exposes us to higher ultra-violet radiation with consequential effects on weather and climate.

Regional pollutants include sulphur dioxide and low level ozone. Sulphur dioxide (SO₂) can cause respiratory problems and contributes to acid rain which damages vegetation and buildings. Low level ozone is produced by complex reactions include Volatile Organic Compounds (VOCs), nitrogen oxides (NO_x) and sunlight in the lower atmosphere near to ground level. Low level ozone is a secondary pollutant which can cause smog, damage vegetation and exacerbate health problems such as asthma. Plants are especially sensitive to ground level ozone.

For most pollutants, the main sources of emissions to atmosphere are from fossil-fuel combustion and vehicles. Road transport is a significant, and in most urban areas, the main source of emissions of all the pollutants covered by the UK National Air Quality Strategy (see 2.3.1) with the exception of SO₂. Combustion plants which provide power are the dominant source of SO₂, and also produce NO_x, VOCs, some particulates and other pollutants. Smaller combustion plants have less impact at national level but can affect local air quality.

Emissions vary dramatically in different areas, depending on the geography, industry and traffic. There is considerable local variation between urban and rural areas, and between residential, commercial and industrial areas. Maps 5a-5i are extracted from Regional Air Quality maps. For any detailed analysis or interpretation always refer to the Regional maps.

The local authorities are currently involved in producing local air quality strategies in order to address problems of air pollution. This is discussed in section 2.3.1.

2.1.4 Agriculture

2.1.4.1 Soil Type

The areas described below correspond to countryside character areas, map 11 shows the boundaries of these areas.

White Peak

The area consists of gently rolling plateau overlain by acidic wind blown deposits dissected by steep sided dales. In some of the Dales nutrients are constantly being washed down the steep slopes or deposited by flooding rivers giving a rich and wet soil. At the top of the dale slopes, thinner more acidic soils are found.

Leadmining has been occurring in this area since the Roman times. As a result there are small heaps of worked spoil, scattered along the lines of old mines on both daleside and plateau fields, that contain high levels of heavy metals.

During times of glaciation pockets of silica sand were deposited in pockets on the limestone.

South West Peak

The high altitude and heavy rainfall has created acidic soils. In the north, large areas are covered by blanket peat deposits

In this area dry heath occupies the lower moor, where the peat is thin, or on the more peaty mineral soils. Occurring on the lower valley sides are peaty flushed alluvium. Much of the upland area of the South West Peak is covered by peat deposits up to two metres in depth.

Potteries and Churnet Valley

The core of this area is the heavily dissected by the Churnet Valley, which is associated with the Carboniferous and Triassic sandstones, overlain in the main with brown earth and podzols.

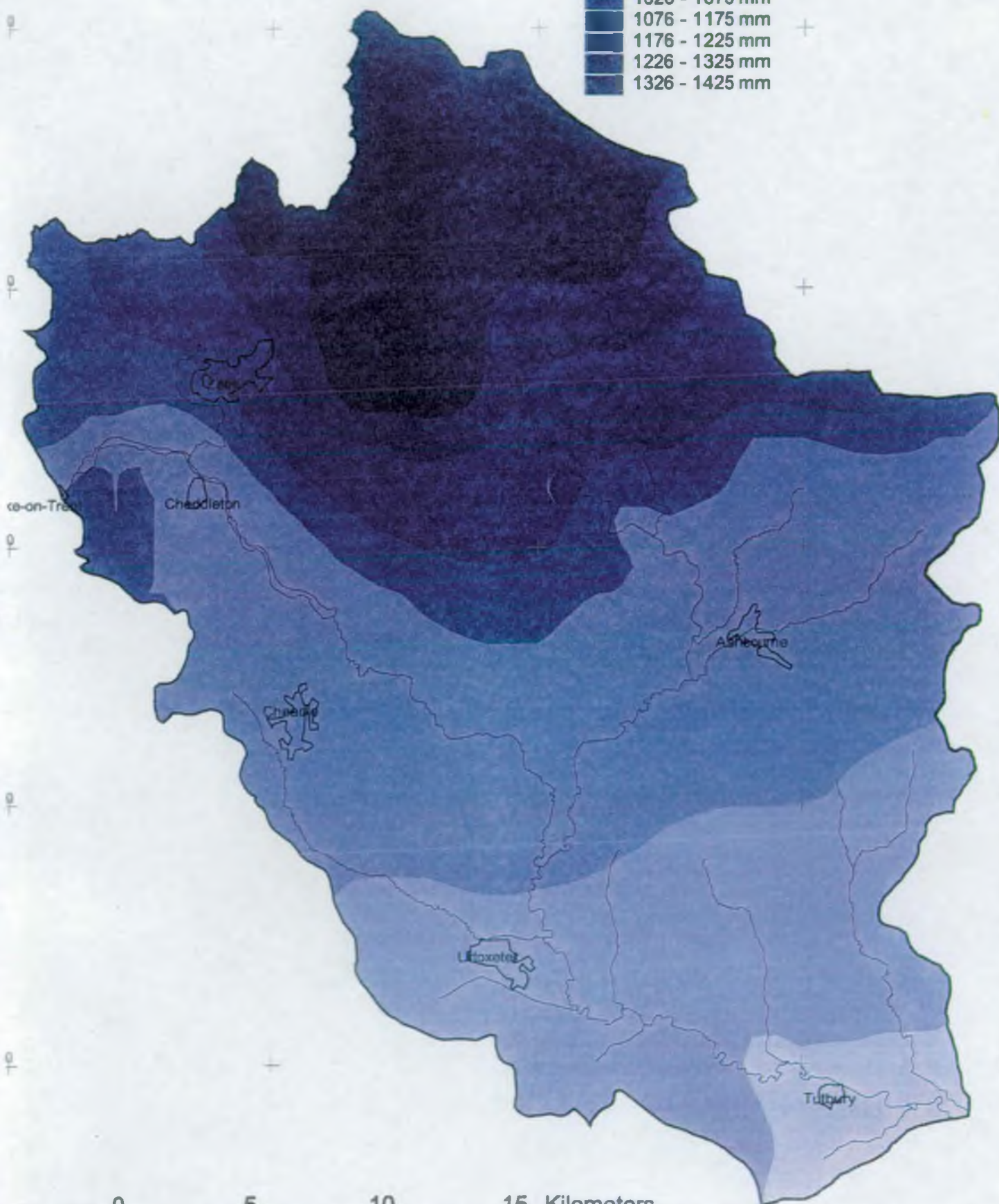
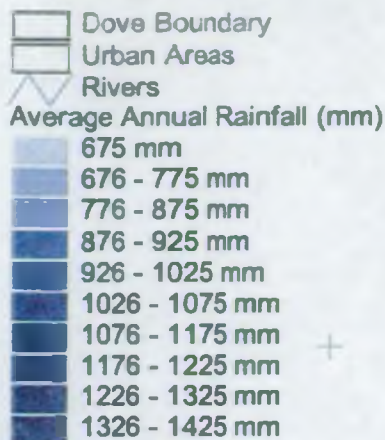
Needwood and South Derbyshire Claylands

To the south of the area, where remnants of the Needwood Forest remain, the calcareous clays of the Mercia Mudstones and thick overlying glacial till produces heavy, poorly drained soils. To the north of the Needwood, on both Derbyshire and Staffordshire sides there is less drift and the gently rolling landscape is dissected by numerous small valleys, with the exposed Mudstones producing red and pink soils that are more easily cultivated.







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 Dove Boundary
 Urban Areas
● Urban

O3 no. days \geq 50 ppb

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 23 - 26
 26 - 29

 29 - 32
 32 - 35
 35 - 38
 38 - 365
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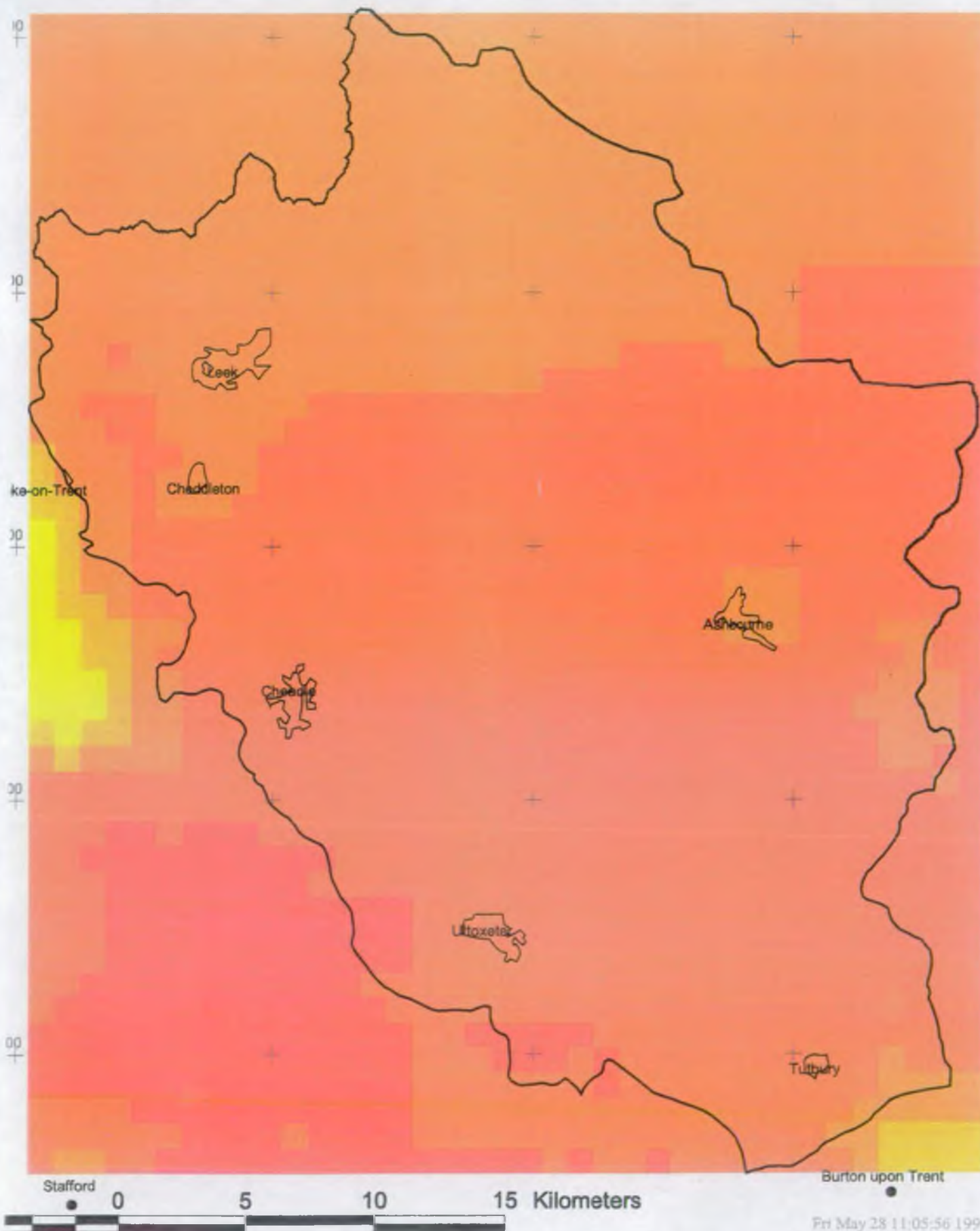
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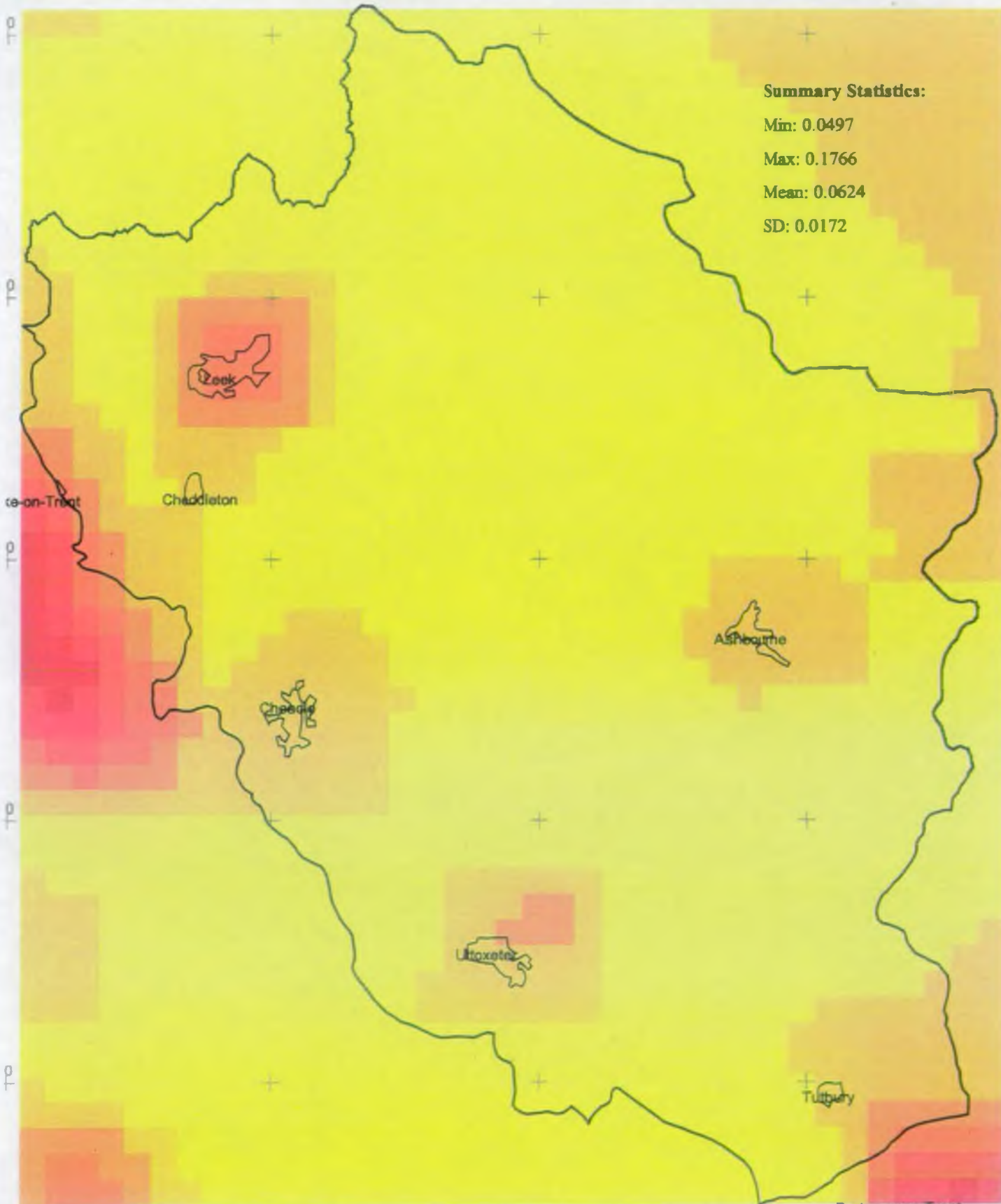
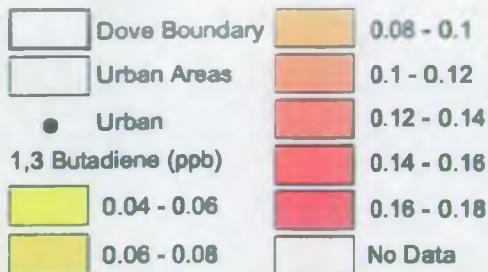


Environmental Agency Plan
 Appendix 5b: Air Quality Pollutants



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Summary Statistics:

Min: 0.0497

Max: 0.1766

Mean: 0.0624

SD: 0.0172

Stafford

0

5

10

15 Kilometers

Burton upon Trent

Fri May 28 11:06:31 1999

3000

400000

410000

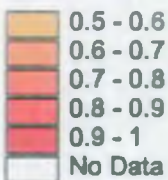
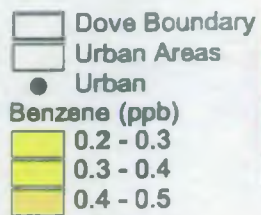
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ip 5c : Air Quality Pollutants



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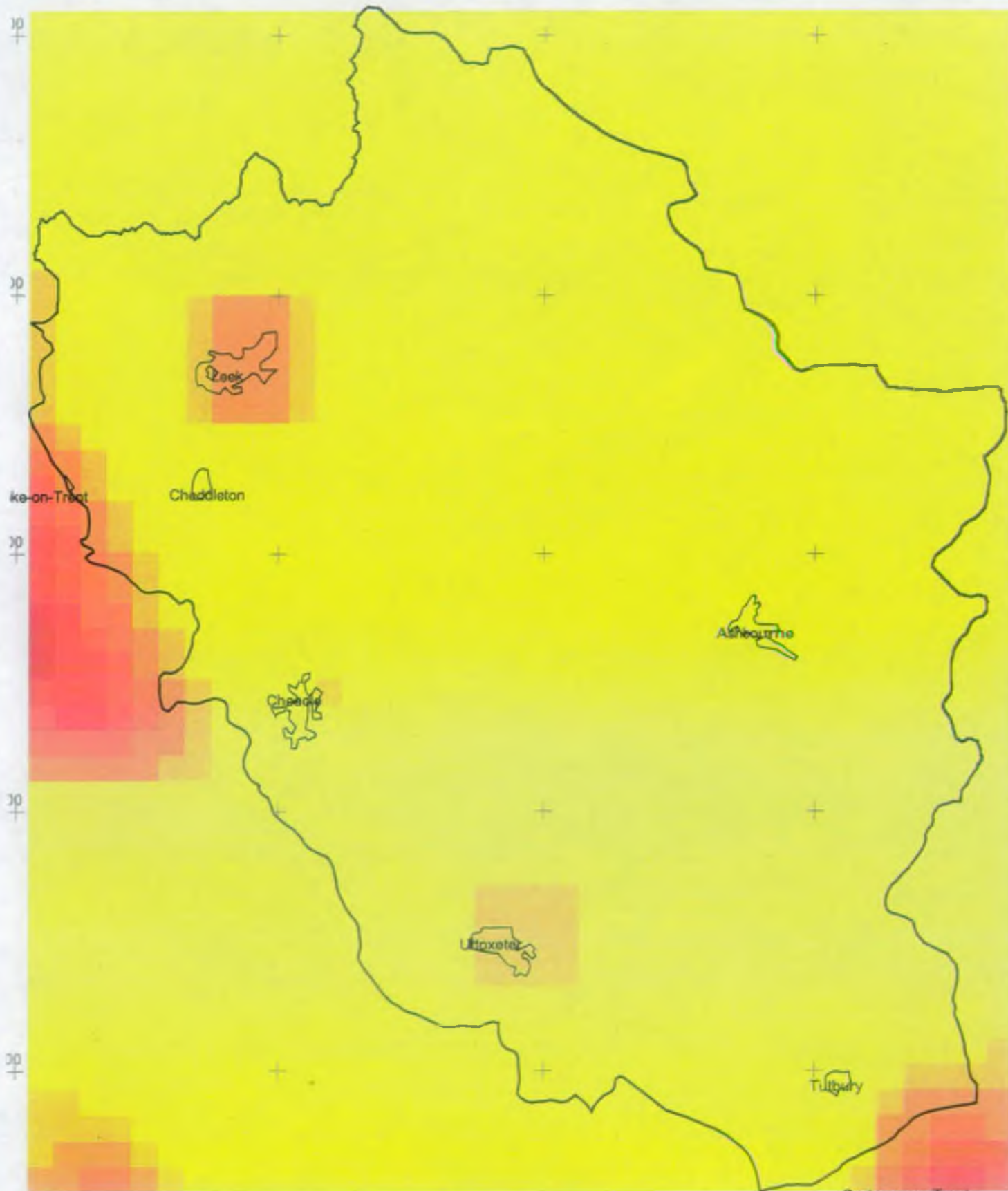
Summary Statistics:

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Max: 0.9173

Mean: 0.3522

SD: 0.0850



Stafford

0

5

10

15 Kilometers

Burton upon Trent

Fri May 28 11:06:24 1999

ve
al Environment Agency Plan
p 5d : Air Quality Pollutants



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- Dove Boundary
- Urban Areas
- Urban
- CO (ppm)
- 0.15 - 0.18
- 0.18 - 0.21

- 0.21 - 0.24
- 0.24 - 0.27
- 0.27 - 0.3
- 0.3 - 0.33
- 0.33 - 0.36
- No Data

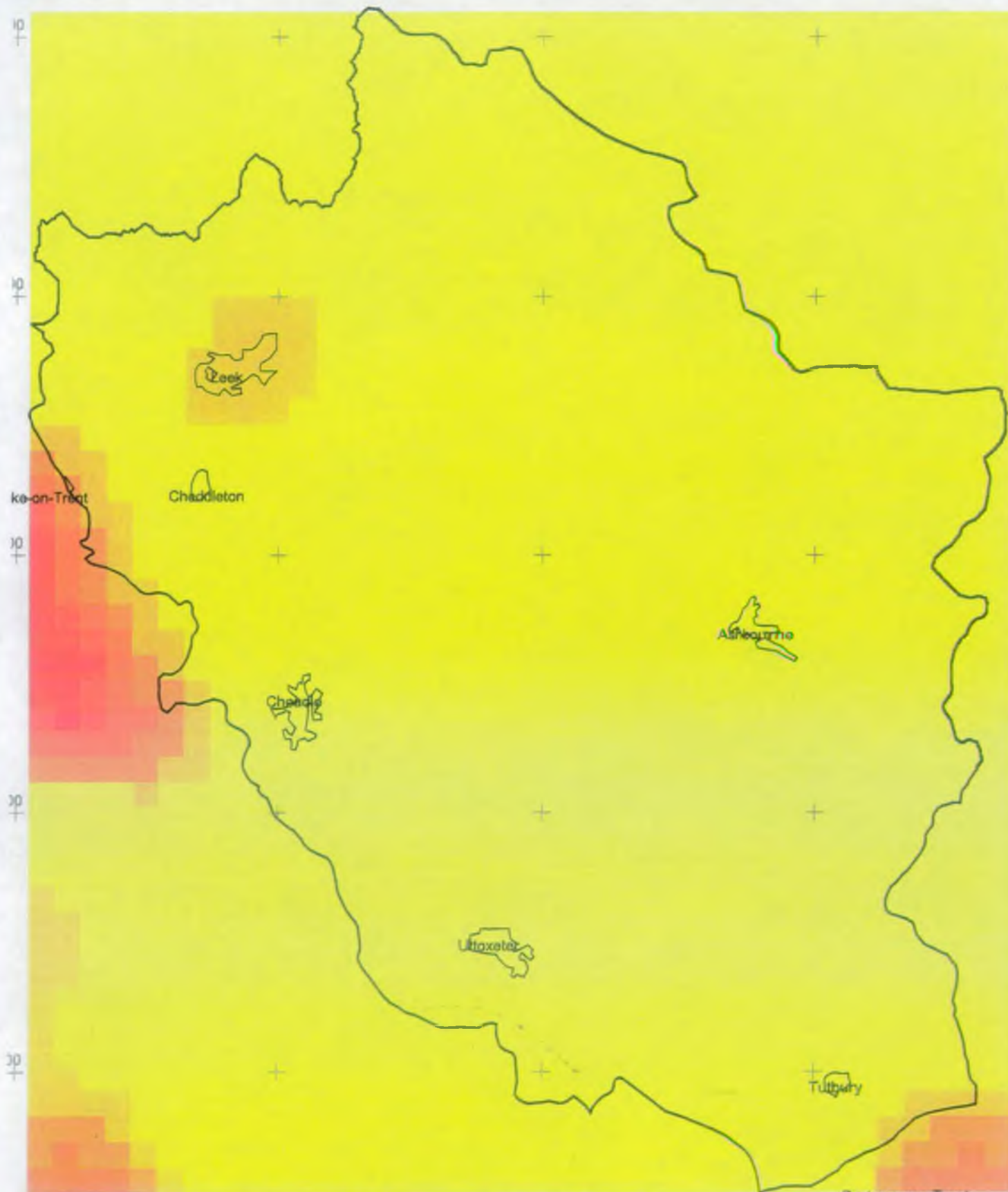
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Max: 0.3255

Mean: 0.1617

SD: 0.0228



Stafford 0 5 10 15 Kilometers

Fri May 28 11:05:52 1999

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400000

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420000

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- Dove Boundary
- Urban Areas
- Urban
- Lead (ngm-3)**
 - 12 - 15
 - 15 - 18
 - 18 - 21

- 21 - 24
- 24 - 27
- 27 - 30
- 30 - 33
- 33 - 36
- 36 - 39
- No Data

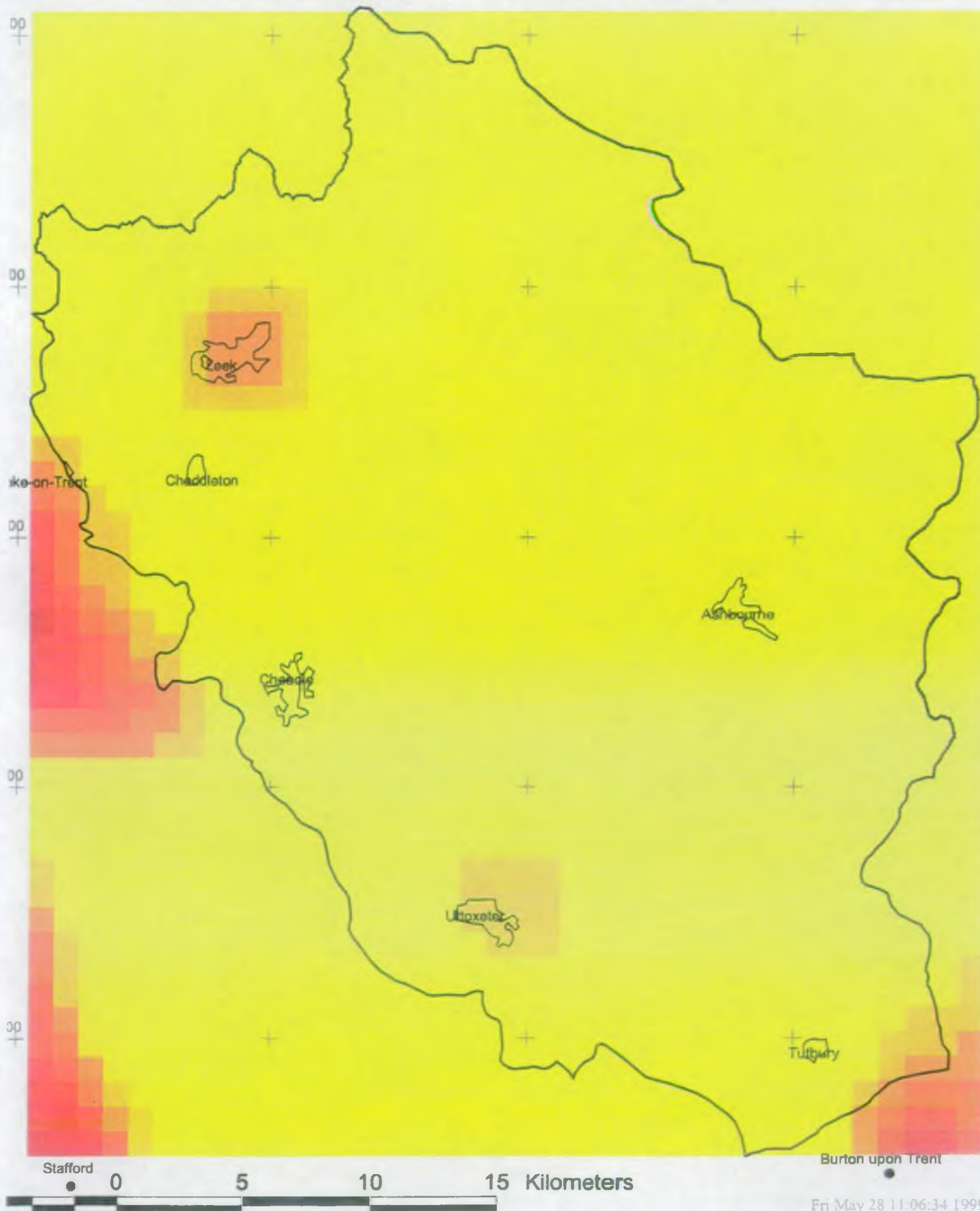
Summary Statistics:

Min: 12.0588

Max: 38.6160

Mean: 15.2540

SD: 3.2690

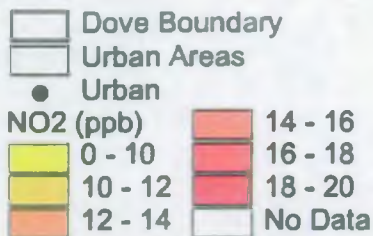


Local Environment Agency Plan
 Map 5f : Air Quality Pollutants



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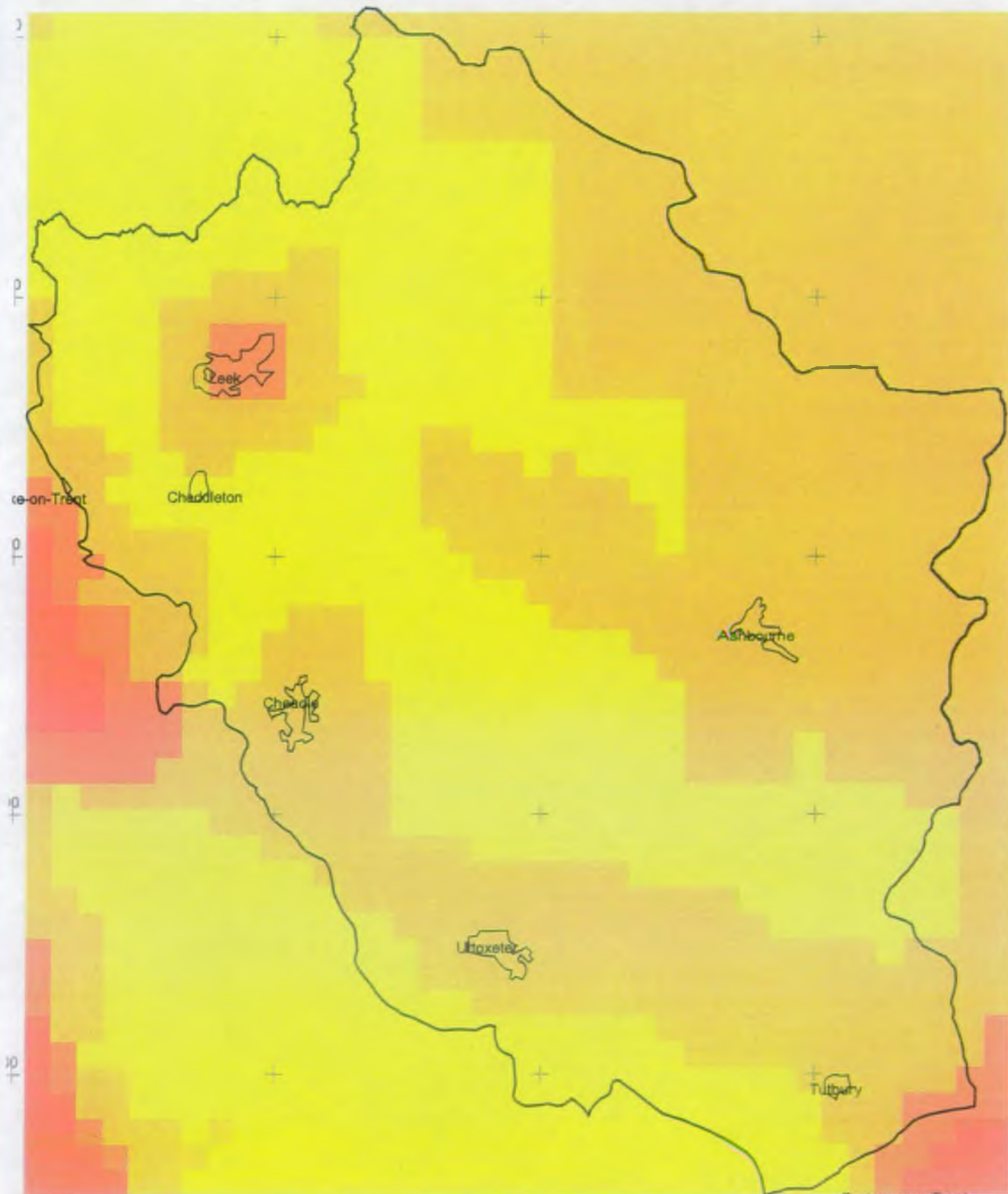
Summary Statistics:

Min: 8.9057

Max: 17.9251

Mean: 10.4913

SD: 1.0882



Stafford

0

5

10

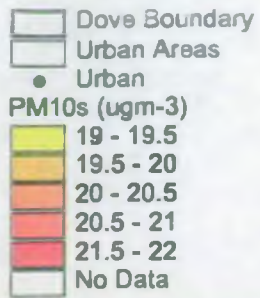
15 Kilometers

Burton upon Trent

Fri May 28 11:06:13 1999



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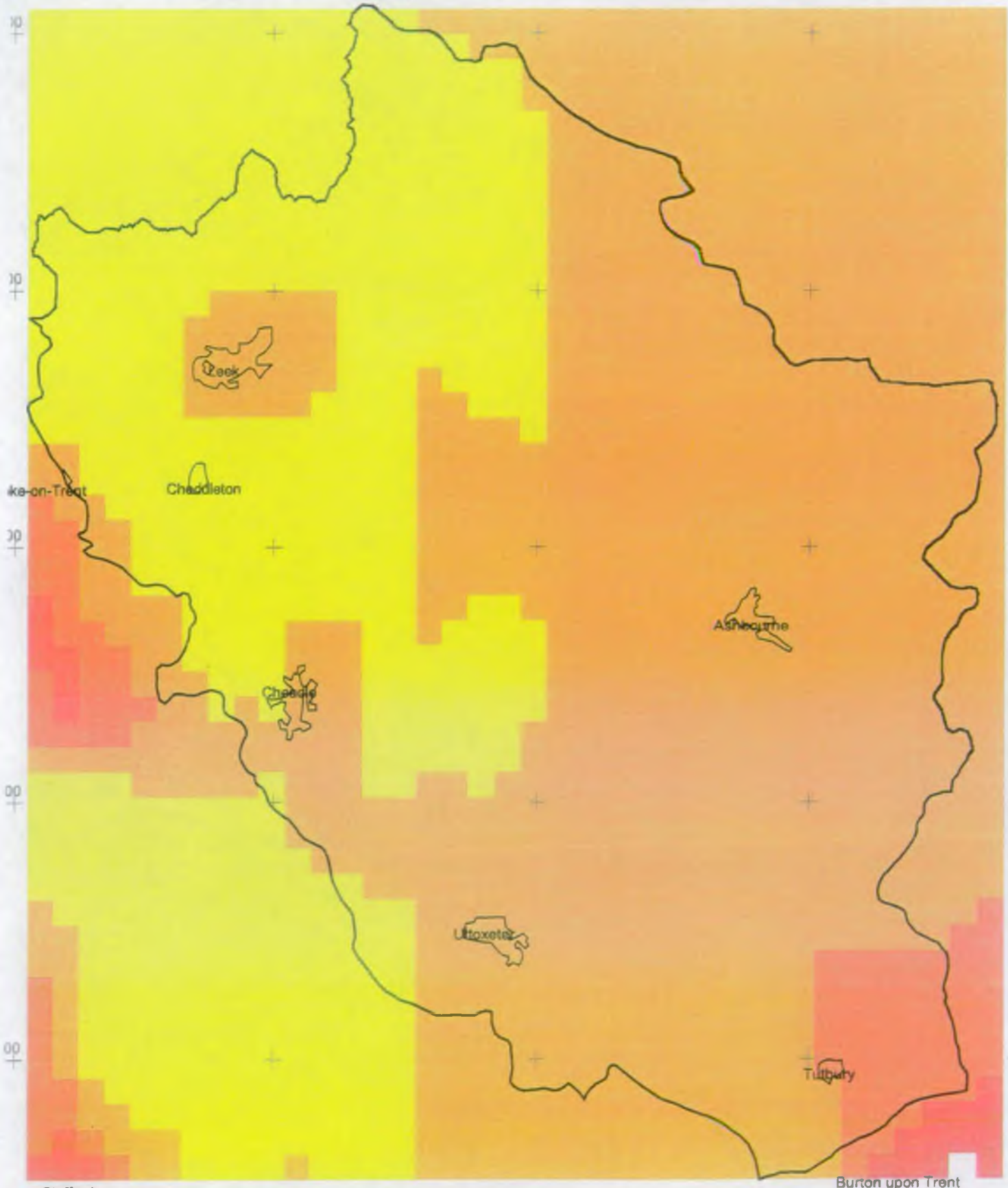
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Max: 21.0757

Mean: 19.6273

SD: 0.2752

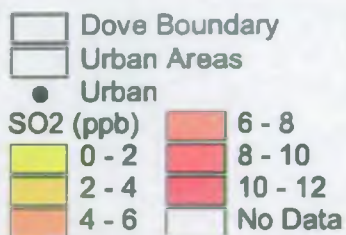


ve
cal Environment Agency Plan
ipsh: Air Quality Pollutants



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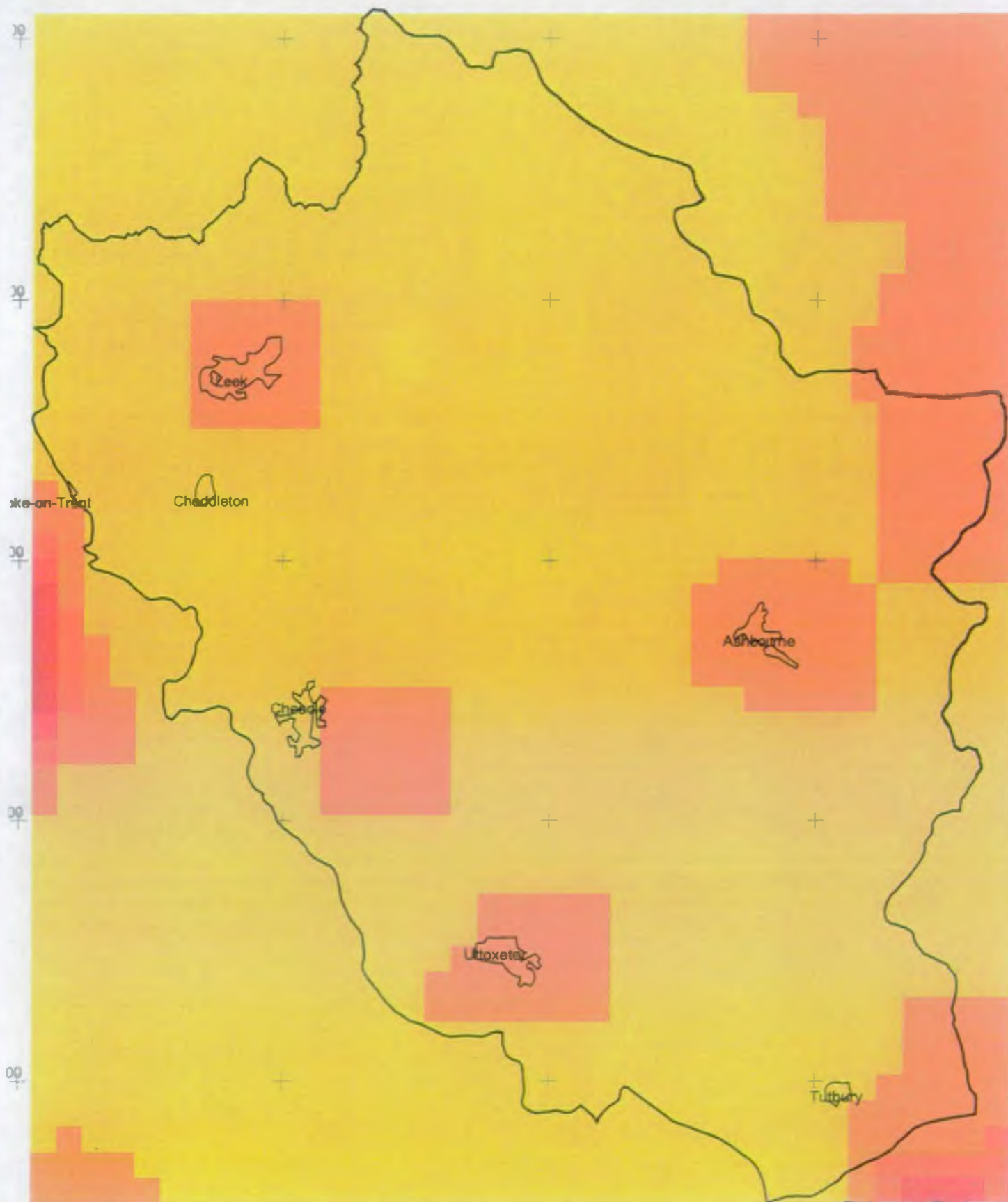
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Max: 11.8880

Mean: 3.8374

SD: 0.6710



Stafford

0

5

10

15 Kilometers

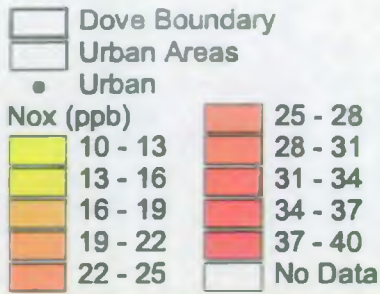
Burton upon Trent

Fri May 28 11:06:02 1999



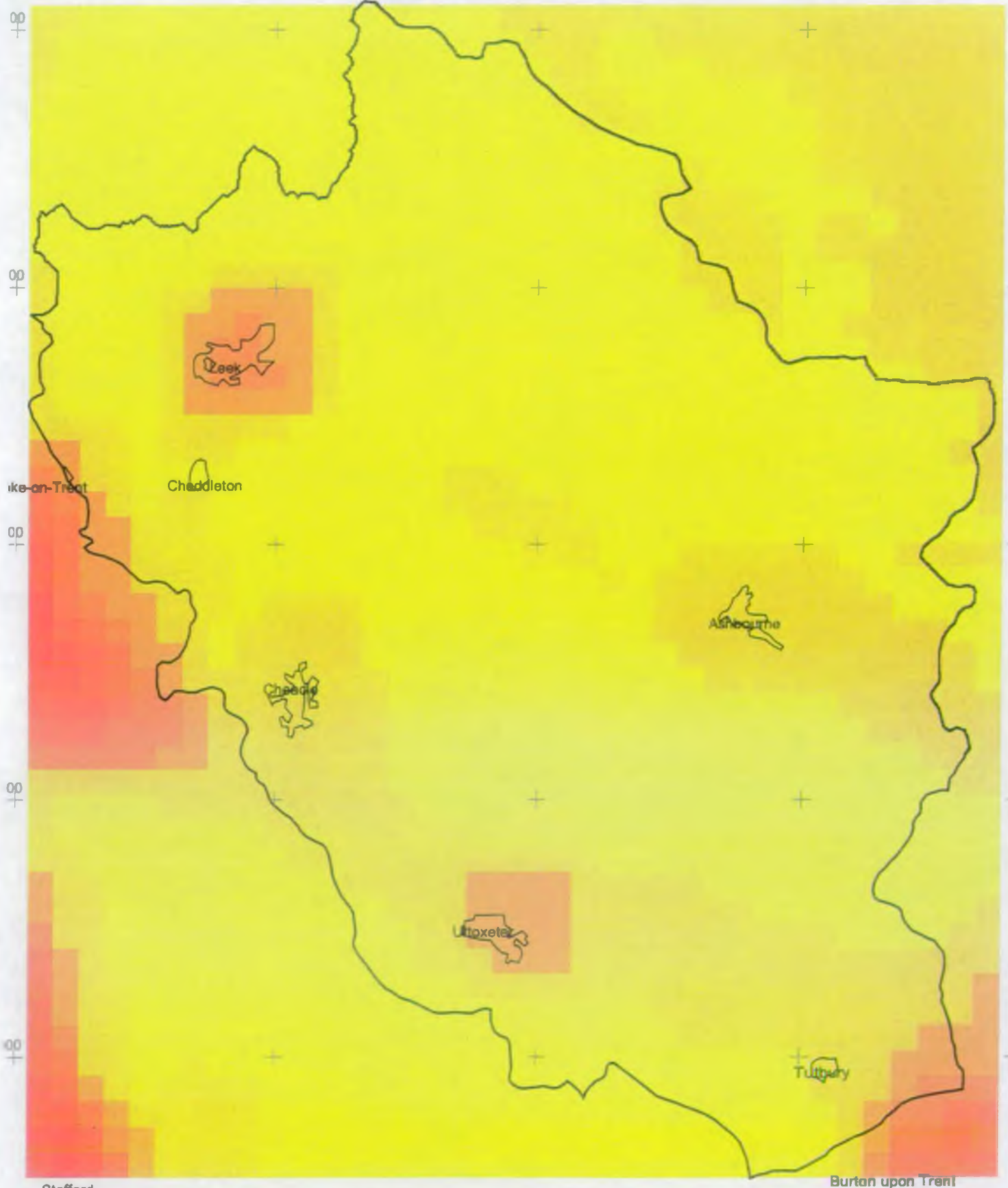
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Summary Statistics:

Min: 10.7668
Max: 34.4786
Mean: 13.6196
SD: 2.9187



Stafford

0

5

10

15 Kilometers

Burton upon Trent

Fri May 28 11:05:47 1999

Derbyshire Peak Fringe and Lower Derwent

To the east, upland areas are covered with acidic soils.

Trent Valley Washlands

On the gravel terraces a coarse-textured sandy loam has developed, while the floodplain is predominantly a heavy clay loam

2.1.4.2 Agricultural Land Classification

Agricultural land is classified under the Ministry of Agriculture's Land Classification (ALC) System according to the degree to which its physical or chemical characteristics impose long term limitations on agricultural use. The limitations may affect flexibility of cropping, level of yield, consistency of yield or the cost of obtaining it. This is expressed in the grading attributed to land under the MAFF ALC system, land is classified into one of 5 grades with Grade 1 being of excellent quality and Grade 5 of very poor quality. Grade 3 comprises good to moderate quality land, being sub-divided into sub-grades 3a and 3b.

Grades 1, 2 and 3a agricultural land are described as the best and most versatile agricultural land in Planning Policy Guidance Note 7. Such land is recognised, in land use planning terms, as having a special importance, which should be protected as a national resource for future generations.

The Northern part of the Dove area is upland which is mainly within grade 4 of the ALC; it has severe limitations to its use. Thus 51% of the land in the LEAP area has been classified as grade 4 with 8% as grade 5 ie moorland. Better quality land (grade 3) occurs largely south of Ashbourne where climate and soils are more favourable. Permanent pasture is the main agricultural use (69%) which, with the short term grassland and rough grazing takes stock farming to 86% coverage of the area. Arable cropping occurs mainly in the south of the area (10%), cereals with some oil seed rape being sown.

In terms of enterprises, dairying and stock rearing predominate with 31% of the holdings being classified as dairying, 16% cattle and sheep (Less Favoured Area) and 25% cattle and sheep (Lowland). The majority of the land is owner occupied (72%), a figure which has tended to increase over the years. Farms are operated as family farms, the average farm size is smaller than the national average with 78% being less than 50 hectares (125 acres) in size compared to 68% nationally. The economic outlook for these businesses is difficult given the low prices currently being received in the market place. The Agricultural Land Classification in the Dove catchment is shown in Map 6 and is summarised in Table 2 and Figure 1.

Table 2 – Agricultural Land Classification

	Area (Km ²)	% for plan area	% for England
Grades 1& 2	17	1.8	16.1
Grade 3	320	33.3	43.6
Grade 4	488	50.8	12.7
Grade 5	77	8.0	8.3
Non-Agricultural	35	3.6	10.1
Urban	23	2.4	9.2
Total	960	100	100

(Information provided by Farming and Rural Conservation Agency.)

2.1.4.3 Farm type and Tenure

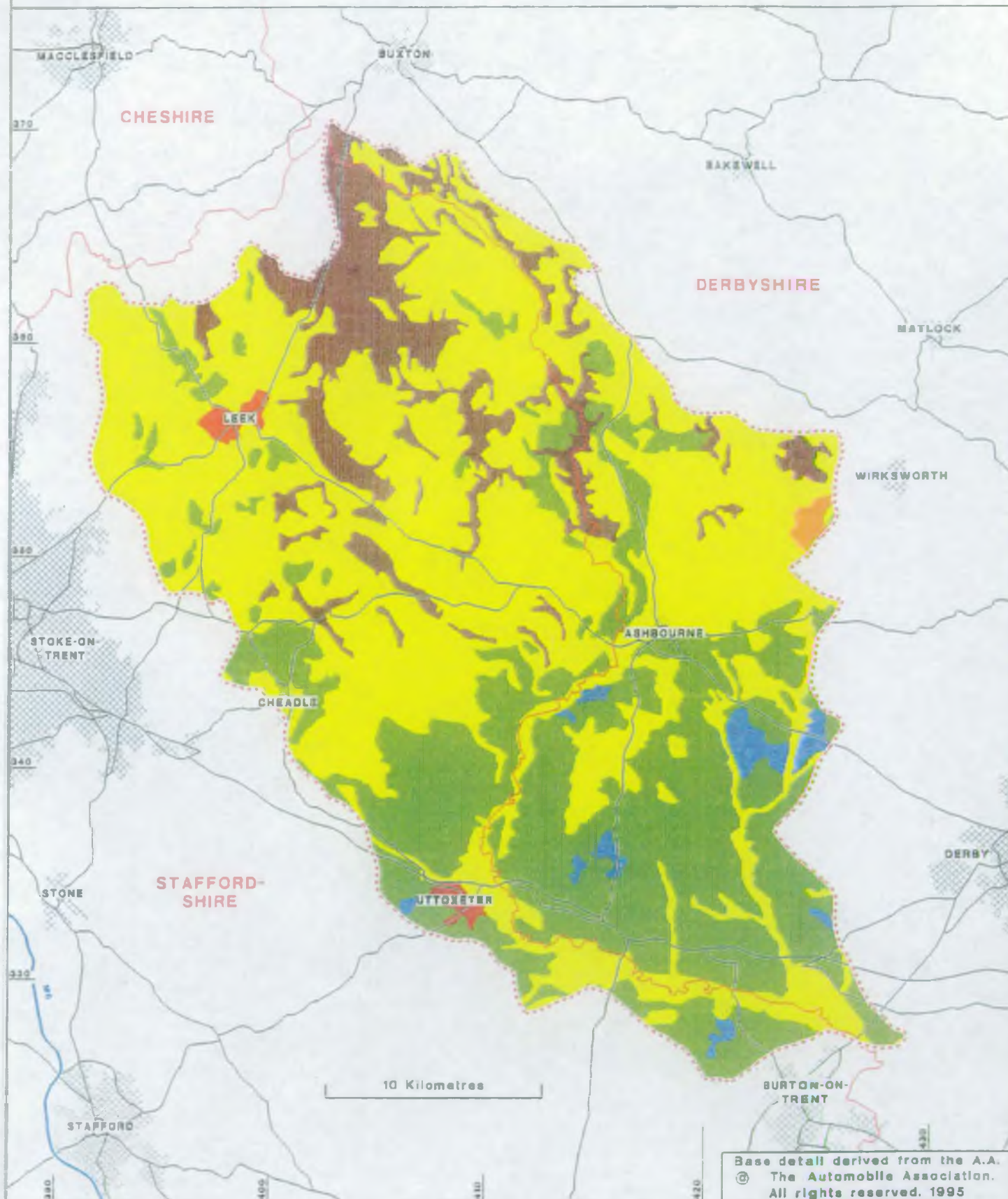
Farm Type

There is a total of 80,149 hectares in agricultural use distributed among 2,235 holdings, the number of holdings has decreased by 1.7% between 1992 and 1997. The number of holdings by EC Farm Type is summarised in Table 3 below and graphically in figure 2 and Map 7.

Table 3 – Holdings by EC Farm Type

	1992	1997	% Change 92 – 97
Cereals	48	50	4.2
General Cropping	8	11	37.5
Horticulture	16	17	6.3
Pigs & Poultry	48	56	16.7
Dairy	813	700	- 13.9
Cattle & Sheep (LFA)	426	364	- 14.6%
Cattle & Sheep (Lowland)	482	563	16.8
Mixed	53	64	20.8
Other Types	379	410	8.2
Total No. of Holdings	2,273	2,235	- 1.7%

Map 6 AGRICULTURAL LAND CLASSIFICATION RIVER DOVE LEAP



Agricultural Land

- Grade 1
- Grade 2
- Grade 3
- Grade 4
- Grade 5

Non-Agricultural Land

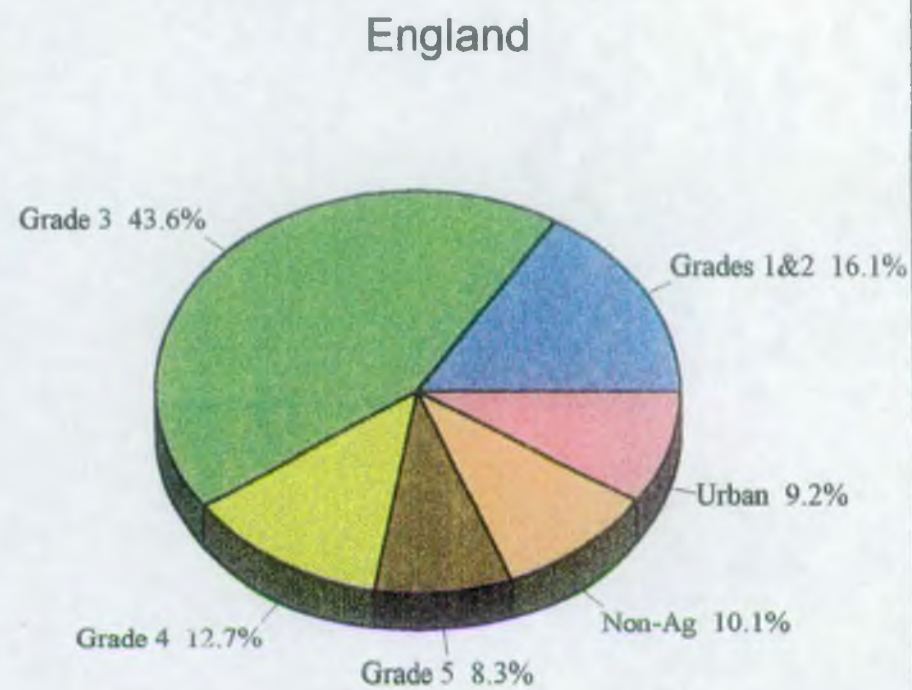
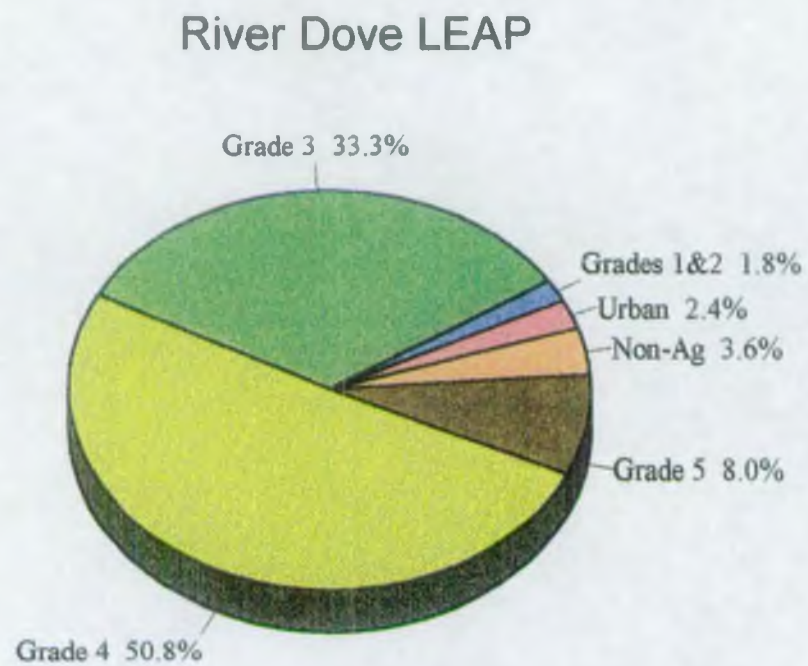
- Land predominantly in urban use
- Other land primarily in non-agricultural use

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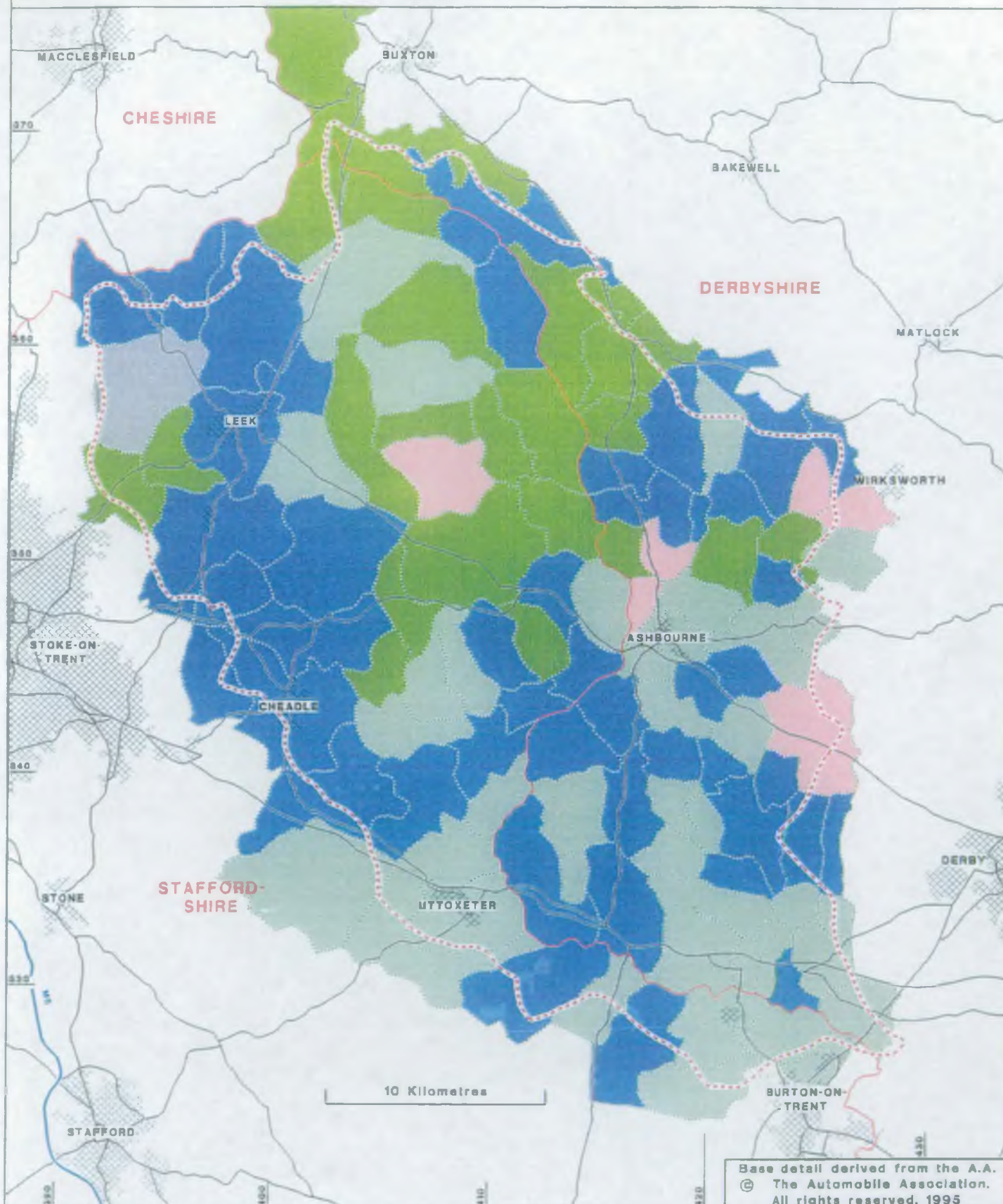
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Conservation Agency - Leeds.
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Fig.1 Agricultural Land Classification in River Dove LEAP



Map 7 DOMINANT FARM TYPE BY PARISH 1997 RIVER DOVE LEAP



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FARM TYPE

- | | | | |
|--|--------------------------|--|---|
| | CEREALS | | MIXED |
| | GENERAL CROPPING | | OTHER TYPES |
| | HORTICULTURE | | No Agricultural Data or Data Suppressed |
| | PIGS & POULTRY | | |
| | DAIRY | | |
| | CATTLE & SHEEP (LFA) | | |
| | CATTLE & SHEEP (LOWLAND) | | |

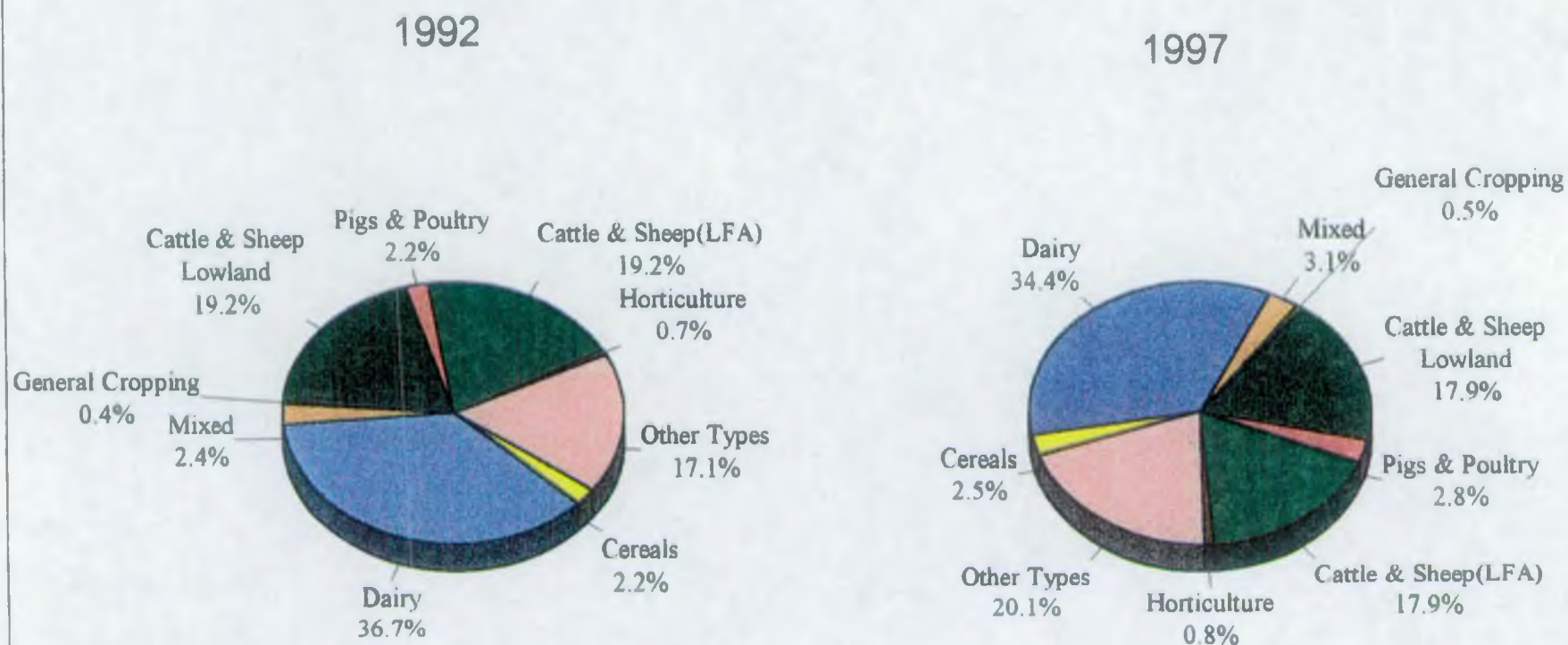
Based on 1996 Parish Summaries

(Data averaged for disclosure parishes)

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Fig.2 Holdings by EC Farm Type in River Dove LEAP 1992 - 1997



Data source : Agricultural Census

Tenure

Of the agricultural area, 28.2% is rented land with the remaining 71.8% being privately owned. Nationally over the last ten years the proportion of rented land has decreased whilst owned land has increased. In the plan area the reduction in rented land over the last ten years was 4%.

2.1.4.4 Agricultural Land Use

Agriculture is the dominant land use within the plan area. Part of the upland area is designated as an Environmentally Sensitive Area (ESA) by MAFF within which grant aid is available to farmers to maintain traditional work practices and to farm more extensively. The extent of the ESA is shown in Map 12.

Of the 80,149 ha used for agriculture, over 80%, 63,371 ha is grassland. This can clearly be seen in Maps 8a and 8b. The overall agricultural land use is summarised in Table 4.

Table 4 – Agricultural Land Use (1997)

	Ha	%
Grassland < 5 years	8,373	8.6
Grassland > 5 years	54,998	71.9
Rough Grazing	5,795	7.1
Crops & Fallow	7,961	9.2
Farm Woodland	1,482	1.9
Other Land	914	0.9
Set-Aside	626	0.4
Total Agricultural Area	80,149	100

2.1.4.5 Agricultural Employment

The total agricultural workforce has decreased by 1.7% in the 10 years 1987-1997. Full-time farmers declined by 8.1% with a 10.3% reduction in spouses and other family workers, there was also a 12.9% decrease in the number of seasonal and casual workers. However managers and hired workers have increased by 20.5% over the same ten year period and there has been a 22.9% increase in the number of part time farmers.

2.1.5 Industry

The industrial development within the catchment of the River Dove reflects in part its Geological and Agricultural nature.

Dairy farming forms the major part of the agriculture within the catchment and three milk processing factories are present at Hartington on the Upper Dove, Ashbourne on the Henmore Brook and Fole on the River Tean, to provide local processing for milk produced.

Meat production within the Dove catchment also reflects the nature of the agriculture. A number of abattoirs and poultry processing factories are active and an animal by-products renderer processes waste generated by this industry.

Other food production includes a biscuit factory at Uttoxeter and a coffee factory at Hatton which uses the River Dove water for cooling purposes.

Much of the area is rich in minerals which have been extracted over hundreds of years. Limestone is quarried extensively for use in the construction industry both for aggregates and cement manufacture. Sand and gravel are extracted at a number of quarries in the area for concrete and construction industries. Gypsum is quarried at Fauld on the lower Dove for plaster manufacture.

The Churnet Valley has a long and extensive Industrial Heritage. The moderately soft water draining peat moorland above Leek attracted a number of dyeing, textile finishing and paper industries to the town. Paper manufacture ceased some time ago but textiles and dyeing still form a major part of the local economy along with the newer industries of chemical manufacture and engineering along the river corridor. Effluents from these factories are treated either by local sewage treatment works or via industrial effluent treatment plants prior to discharge into the river. Management of these industries and their needs in terms of Water Resources and Regulation gives a challenge for the Agency.

2.1.6 Minerals

Table 5 – Minerals within the area

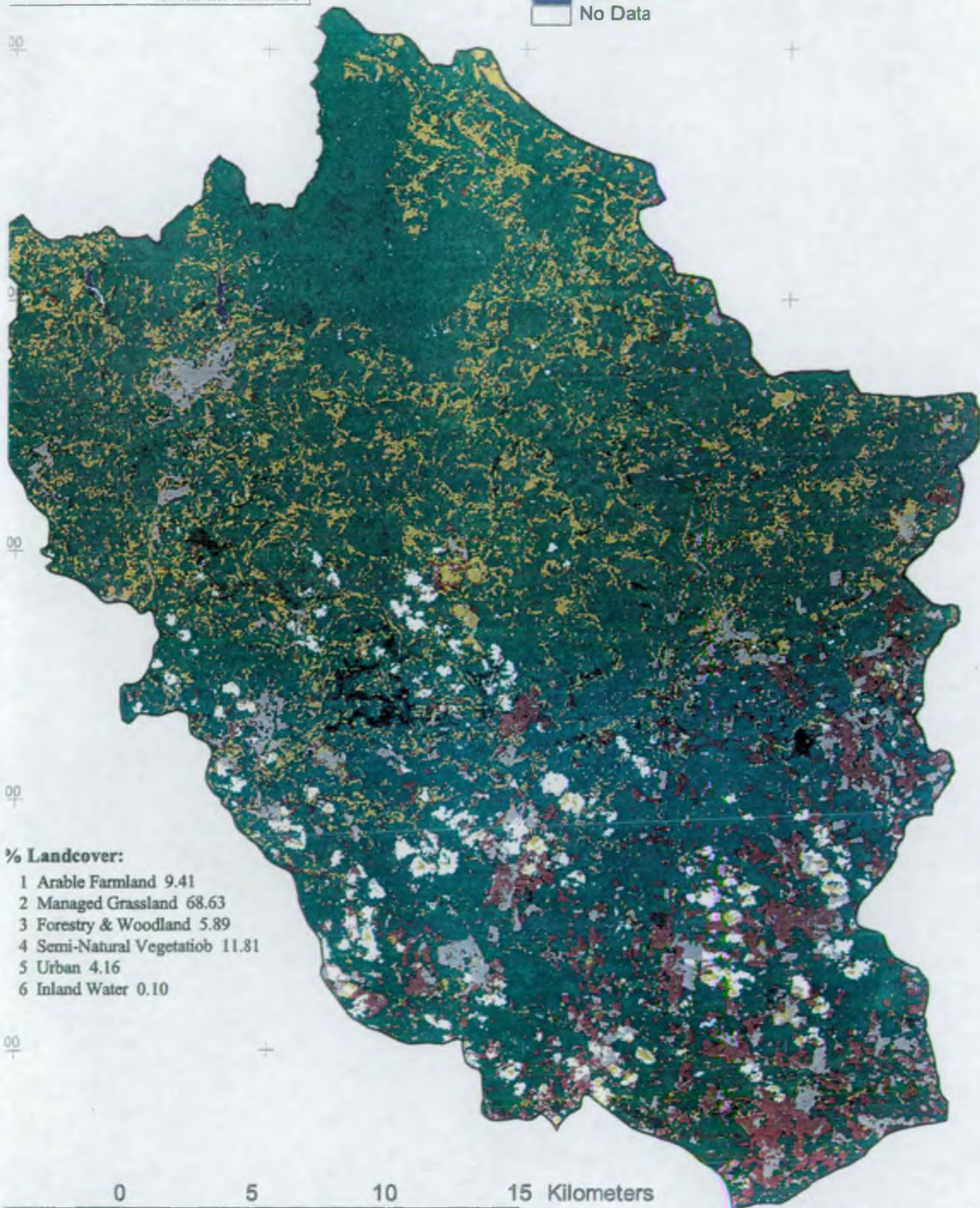
Mineral	Location
Sherwood Sandstone	Croxden and Cheadle area
Carboniferous Limestone	North Staffordshire – fringe of the Peak District National Park
Mercia Mudstone	Central and Eastern parts of Staffordshire
Gypsum and anhydrite	Staffordshire and Tutbury Sulphate Seam of the Mercia Mudstones
Alabaster	Staffordshire and Tutbury Sulphate Seam of the Mercia Mudstones
Coal Measures	Cheadle Coalfield
Copper, Iron, Lead, Zinc, Barite and Fluorspar	Derbyshire Orefield extending into the Peak District National Park



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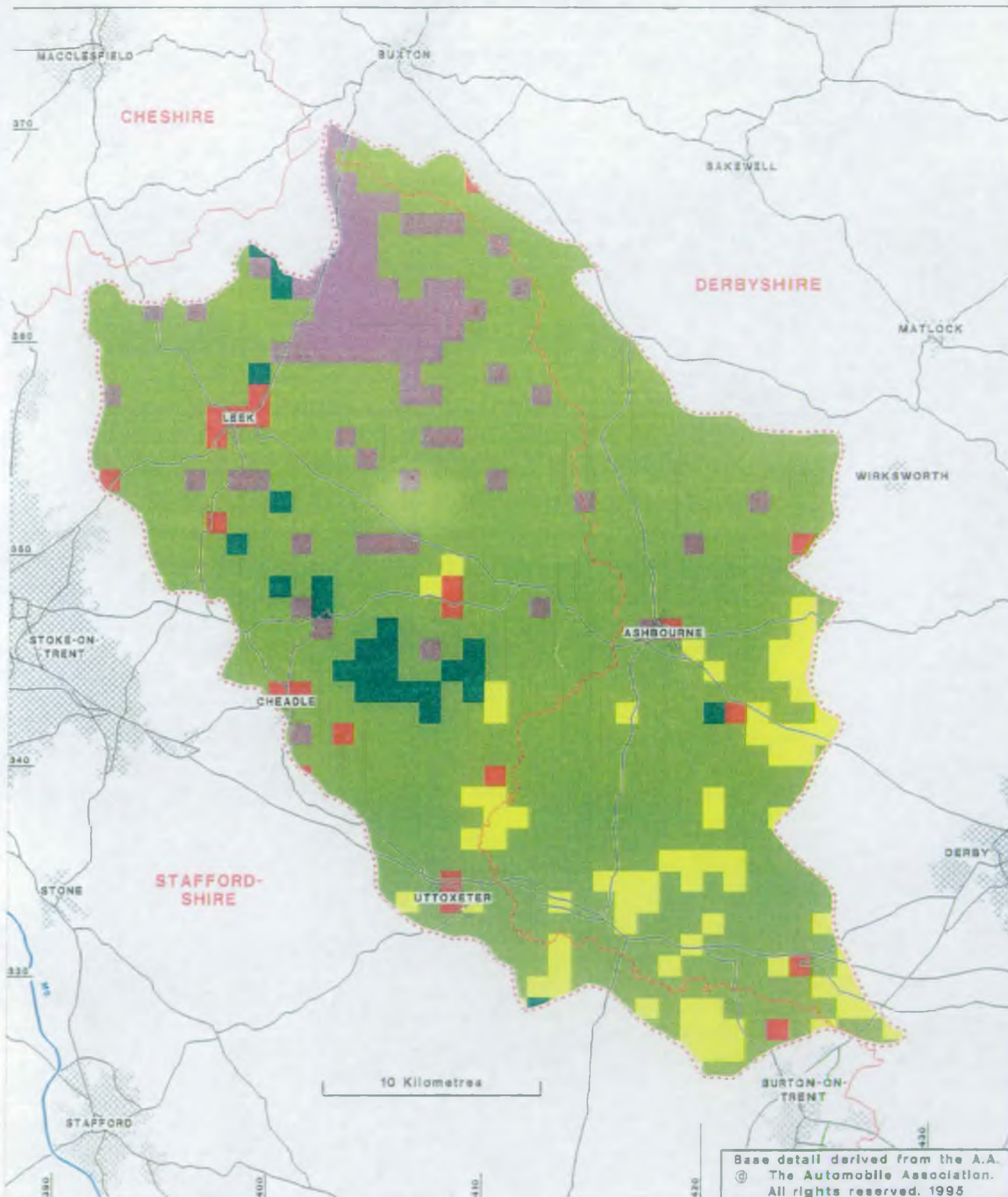
- Dove Boundary
Landcover (1990)
- Arable farmland
 - Managed grassland
 - Forestry and woodland
 - Semi-natural vegetation
 - Urban
 - Inland water
 - No Data









% Landcover:

- 1 Arable Farmland 9.41
- 2 Managed Grassland 68.63
- 3 Forestry & Woodland 5.89
- 4 Semi-Natural Vegetatiob 11.81
- 5 Urban 4.16
- 6 Inland Water 0.10

Map 8b DOMINANT LAND COVER BY 1 KILOMETRE SQUARE RIVER DOVE LEAP



LAND COVER

	Grassland		Urban \ Bare Ground
	Moorland \ Heath		Woodland
	Arable		Open Water

(Data Source: ITE Land Cover)

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- Dove Boundary
- Urban Areas
- Minor Rivers
- Flood Risk**
 - no flood
 - non-flooded rivers
 - flood depth < 1m
 - flood depth 1 - 2m
 - flood depth > 2m



Area of Flooding (km²) & % of Total Area:

Flood: 951.653 (94.57%)
 non-flooded rivers: 1.6325 (0.16%)
 flood depth < 1m: 21.6525 (2.15%)
 flood depth 1-2m: 22.14 (2.20%)
 flood depth > 2m: 9.2075 (0.91%)

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Details: Morris, D.G. & Flavin, R.W. 1996 'Flood Risk Map for England and Wales' IH Report No. 130.

Printed May 28 11:05:11 1999

The mineral resources of the plan area reflect the complex geological history of the area over the last 340 million years. These events produced a wide range of rock types, mainly sedimentary, either exposed at the surface or found at relatively shallow depth beneath a cover of younger sedimentary rocks, including superficial (unconsolidated deposits). These older sediments were laid down in a variety of environments and climatic conditions very different from those existing in the area today. Following deposition, the sediments were compacted and naturally cemented forming the major part of the mineral resources of the area.

2.1.7 Contaminated Land

If harmful substances contaminate land, it may pose a risk to human health, surface and ground water, ecosystems, man-made structures and services, and may affect how the land is used.

The Agency's vision, as set out in our Environmental Strategy, is *"to see more contaminated land made safe and brought into beneficial use, and an integrated approach to preventing and controlling new land contamination"*. Currently we have little control over contaminated land unless pollution of ground or surface waters is occurring, in which case we have powers under the Water Resources Act 1991 (WRA 91) to enter land in order to undertake works to ameliorate pollution (s161 WRA 91). In April 1999 the Groundwater Regulations came into force, implementing the Groundwater Directive (see section 2.3.4). This will increase the Agency's powers so that we may prevent future pollution of controlled waters by certain dangerous substances. The emphasis will be on owners to ensure that their activities are not impacting on the underlying groundwater. The most polluting activities and the more vulnerable aquifers will be prioritised. Local authorities also have powers to require the clean up of contaminated land causing environmental problems, through their powers relating to statutory nuisance.

A new legal framework for contaminated land is to be introduced under Part IIa of the Environmental Protection Act 1990. It will be enforced primarily by the local authorities with assistance from the Environment Agency, and will require local authorities to inspect their areas so as to identify contaminated land, and provide powers to require remediation of such land. The role of the Environment Agency will be to:

- Provide site –specific guidance to local authorities
- To act as the regulator for any contaminated land categorised as "special". Special sites may include those sites with more serious problems or with which the Agency may have the more relevant technical expertise.
- To publish a report on contaminated land
- To make arrangements for carrying out technical research and to act as a centre of expertise.

Details of special sites will be kept on public register. 'Contaminated land' is defined in s57 of the Environment Act 1995 as land that appears to the authority to be in such a condition that either:

- Significant harm is being caused or there is a significant possibility of such harm being caused; or
- Pollution of controlled waters is being, or is likely to be caused.

For land to be identified as 'contaminated', pollutants must be shown to be causing significant harm, or have the potential to cause harm, to a specific 'target' of importance (either human health, certain designated nature conservation sites, buildings, crops, livestock or controlled waters) via an identified pathway. This focuses attention onto sites that cause problems in their current state. Other sites could however pose contamination problems if redeveloped, unless adequate care is taken.

However, implementation of the new provisions has not yet been carried out, and delays to its implementation and changes announced by the Government in more recent announcements mean that it is now not expected to be implemented before December 1999.

Until site inspections are carried out by local authorities of their areas to identify land contamination under the Part IIA of the Environmental Protection Act 1990, only a general picture of the extent and nature of contaminated land in the Dove area can be given from existing sources of information.

Urban areas generate the most solid waste, most of which has been disposed to landfill sites. Past industrial and waste disposal practices were subject to fewer controls than at present, and land contamination has also occurred through accidental spillage and casual disposal practices. We are therefore aware of areas of contaminated land in the plan area. Contaminated land is not a serious problem in the Dove catchment, although one site at Leek, for example, which has been used for industrial purposes for many years is known to have contamination concerns. This issue is discussed in issue 4 of the Dove LEAP Consultation Draft.

2.1.8 Catchments and Flood Defence

2.1.8.1 Sub catchment descriptions

The Dove catchment comprises of the rivers Dove, Hamps, Manifold, Churnet and Tean and their tributaries. The catchment drains to the River Trent just North East of Burton on Trent at Newton Solney.

The River Dove rises on the eastern side of Axe Edge, a high gritstone moor and flows almost southwards to the boundary of the Peak District, forming the boundary between Derbyshire and Staffordshire for the whole of its length.

The upper reaches of the River Dove and its main tributaries upstream of the River Churnet, are high quality rural rivers. This northern part of the catchment is underlain by Carboniferous Limestone and the waters are therefore hard. The high quality groundwater provides an important baseflow to the rivers. The land use is mainly rough grassland and upland pasture dominated by sheep farming, there is very little industry.

The upper reaches of the River Churnet, upstream of Leek, are of good quality. The catchment is predominantly underlain by Carboniferous Namurian Sandstone (millstone grit). The water is impounded in Tittesworth reservoir and used as drinking water supply for Stoke.

The lower reaches of the River Churnet are of fairly good quality and characterised by soft water. The catchment is mainly on Triassic Mercia Mudstone. The quality of the rivers has improved since the Second World War and in particular over the last decade as a result of investment in sewage works.

The River Tean flows from just east of Stoke on Trent and passes near Uttoxeter before entering the Dove. The only major discharge to the River Tean is from Checkley Sewage Treatment Works. The treated sewage effluent discharge makes up over half the flow in the river in dry weather. Installed as part of the Asset Management Plan 2 (AMP2) investment a new activated sludge plant and sandfilters are now operating at Checkley STW. This has resulted in visual improvements and enhanced biological quality in the river stretch downstream of the discharge.

2.1.8.2 Flood defence

A key aim of the Environment Agency is to provide effective flood defence and warning systems to protect people and property against flooding from rivers and the sea.

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 snow melt. 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 watercourse will respond differently to the same rainfall 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 run-off, so river levels will rise less rapidly but remain at a higher level longer.

Water flows into the flood plain when the flow of a watercourse exceeds its capacity. These natural floodplains provide extra capacity for the storage and passing downstream of flood water and are important for species dependent on seasonal flooding. The capacity is reduced if significant areas of floodplain have been raised, embanked or built upon. This loss of storage volume can lead to higher river levels elsewhere and for this reason it is not possible to alleviate flooding in all areas. The priority for flood alleviation schemes lies in urban areas as undeveloped floodplains should be allowed to play their natural role as the continuity between the river and its floodplain is an essential part of the water cycle.

2.1.8.3 Main rivers

All watercourse are classified as either 'main river' (which is defined on maps held by the Agency and MAFF) or 'ordinary watercourses' (sometimes referred to as 'non-main river'). In broad terms main river includes most watercourses which contribute significantly to a catchment's drainage though ordinary watercourses may be significant more locally. The legislation dealing with main river is the Water Resources Act 1991 and is supplemented by local Bye-laws. Proposed revisions to main river are dealt with through a consultation and advertising process with the decision being made by MAFF.

The Agency has permissive powers, on main river, to undertake works and to exercise powers in this respect according to available resources and priorities. In the Dove catchment the length of main river is 186.5 Km. Local authorities and Internal Drainage Boards, have powers to carry out flood defence works on ordinary watercourses. The appropriate legislation relating to ordinary watercourses is to be found in the Land Drainage Act 1991.

2.1.8.4 Flood Risk Areas

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 through the planning system.

Local planning authorities and the Agency are required by the DETR in Circular 30/92, on Development and Flood Risk, to liaise closely on flooding and surface water run-off 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 local planning authorities. Flooding and drainage issues are also to be taken fully into account during the preparation of land use development plans. The Agency has responsibility to prepare surveys under Section 105 of the Water Resources Act 1991 to define nature and extent of flood risks. The surveys will indicate the 1:100 fluvial and 1:1000 coastal flood plains and are of strategic importance.

The Agency already has good information regarding areas historically affected by flooding and is building on this to complete the Section 105 surveys. This works will include topographical surveys to identify areas theoretically at risk from flooding but protected by flood defences. An exceptional flood event could have an impact on these areas. The Agency is also actively reviewing particular areas believed to be at highest risk.

Map 9 shows the extent of the flood risk areas in the Dove catchment.

2.1.8.5 Land Drainage Consents

Under the Water Resources Act 1991, Land Drainage Act 1991 and associated bylaws, works in ordinary watercourses and works in, over, under or adjacent to main rivers, requires the consent of the Agency. This ensures that they do not interfere with the Agency's work, adversely affect fisheries, wildlife and flood defence in the locality. If work is carried out without land drainage consent, the consequences can be expensive. The Agency can reclaim from the offender the cost of whatever work it decides is necessary to remove or alter the work. We can also require the offender to put things right and failure to do so may be a criminal offence.



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Dove Boundary

Urban Areas

Minor Rivers

Flood Risk

no flood

non-flooded rivers

flood depth < 1m

flood depth 1 - 2m

flood depth > 2m



ask of Flooding (km2) & % of Total Area:

> Flood: 951.653 (94.57%)

non-flooded rivers: 1.6325 (0.16%)

flood depth <1m: 21.6525 (2.15%)

flood depth 1-2m: 22.14 (2.20%)

flood depth >2m: 9.2075 (0.91%)

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details: Morris, D.G. & Flavin, R.W. 1996 'Flood Risk Map for England and Wales' IH Report No. 130.

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2.1.9 Water Resources

2.1.9.1 Surface water

The largest surface water licence is Severn Trent Water's (STW) abstraction for public water supply from Carsington Reservoir and at Egginton Intake for Staunton Harold and Foremark Reservoirs. Carsington Reservoir is a pumped storage reservoir for the River Derwent and the net abstraction from the Dove catchment is limited. The largest industrial abstraction is Norcart at Leek. There are also large surface water abstractions for cooling water at Nestle, Joshua Wardle and Blue Circle and mineral washings at ARC, most of which is returned to the Dove. There are a large number of surface water licences for spray irrigation with the majority issued in the past 20 years subject to some form of restriction linked to a prescribed flow at an appropriate control point.

For licensing purposes the catchment is divided into seven subcatchments.

SC25	Upper Dove
SC26-28	River Manifold
SC29	River Dove mid reaches to Churnet confluence
SC30	River Churnet
SC 31,33,35	River Dove lower reaches to Trent confluence
SC32	River Tean
SC34	Hilton Brook

The total number of licences within each licensing sub-catchment is summarised in Table 6. There are 78 surface water licences of which 19 have some sort of restriction tied to a prescribed flow. Of the remaining licences, 37 are Licences of Right following the 1963 Water Resources Act. There are 262 groundwater licences, of which 209 are Licences of Right

Table 6 – Summary of Licences by Sub-catchment, 1995

SC	Surface Water					Groundwater			SW& GW
	LoR	PF	LPF	Other	Total	LoR	Other	Total	Total
25-28	4	0	1	0	5	17	10	27	32
29	7	1	1	2	11	32	2	34	45
30	20	4	2	14	40	73	27	100	140
31,33, 35	4	3	1	2	10	52	55	57	67
32	2	1	0	1	4	10	6	16	20
34	0	3	2	3	8	25	3	28	36
	37	12	7	22	78	209	53	262	340

SC Sub Catchment, LoR Licence of Right, PF Prescribed Flow, LPF Local Prescribed Flow

Other = Licences issued since 1965 without flow or level restriction including current time limited licences.

2.1.9.2 Groundwater

There are substantial quantities of groundwater licensed from aquifers, with approximately 80% by annual volume for public water supplies. The major aquifer management units are Leek, Alton, Tean and Greatgate. The largest groundwater licences are STW's abstraction from the Leek unit to Tittesworth Reservoir. The largest industrial groundwater abstractors are Joshua Wardle at Leek, Nestle at Ashbourne and Tarmac at Croxden.

The six groundwater management units within the Dove catchment represent sub-divisions of the major Triassic Sandstones aquifer. See Map 10. The policy towards further development of groundwater within these units is based on present intensity of use and an understanding of environmental problems related to existing levels of abstraction. Each aquifer unit has been assessed to define the water resource capacity and potential for further development and then categorised on the following classification:

Category A	No resources available.
Category B	Special study needed and presumption against large licences.
Category C	Special study – no presumption.
Category D	Resources available.

In groundwater units where resources are available, further licensing of new abstractions is possible, but the objective is to ensure this is not beyond the sustainable limit. Where over abstraction has occurred, no further licences will be authorised and actual reductions in abstractions will be sought.

The network of regularly monitored observation boreholes provides a record of local groundwater levels within the aquifer. An annual appraisal is also made of the resource balance, on the basis of actual abstraction data. The current state of each assessed aquifer unit within the catchment is summarised below:

Shirley Groundwater Unit – Category D

Less than 2% of the assessed recharge to the aquifer is licensed. In theory this unit has substantial potential for further resource development although existing borehole yields are low. There are no objections in principle to new groundwater licence applications, but baseflow protection has to be considered, especially for large proposals.

Mayfield Groundwater Unit – Category D

Groundwater reserves are available for development, with only 10% of the assessed recharge currently licensed. The policy is therefore to give favourable consideration to new licence applications, subject to safeguards to protect baseflow to surface watercourses. Existing borehole yields are low.

Alton Groundwater Unit – Category B

Approximately 66% of the assessed recharge is currently licensed, primarily for public water supply. New licences can still be considered but medium to large proposals will almost certainly have a compensation flow component included to protect baseflows.

Greatgate Groundwater Unit – Category A

Some 85% of the assessed recharge is currently licensed. Low flow problems are experienced in the Croxden Brook and its tributaries, primarily due to abstraction at Greatgate Pumping Station. No further development of groundwater resources can therefore be considered.

Tean Groundwater Unit – Category B

Almost 95% of the assessed recharge is licensed, but the groundwater resource is probably enhanced by influent conditions in the River Tean in the vicinity of Tean Pumping Station. No further large licences are being considered to ensure baseflow protection.

Leek Groundwater Unit – Category A

This unit is over-licensed and over-abtracted. High rates of abstraction for public water supply in recent years have caused rapidly declining groundwater levels. No further licences can be considered, and more conjunctive use of groundwater and surface water is required to ease the high rate of groundwater abstraction.

In addition to the Triassic Sandstone groundwater management units, the catchment also includes the Carboniferous Limestone of the Peak District National Park. The groundwater resources of the Carboniferous Limestone have not been assessed although current levels of licensed groundwater abstraction are extremely low.

2.1.9.3 The Upper Churnet Valley

The Upper Churnet Valley has provided important sources of water for industry and public supply since the mid 19th Century. Groundwater development has concentrated on the high yielding Triassic Sherwood Sandstones aquifer that outcrops in the vicinity of Leek. The impact of such abstraction on the surface waters has long been recognised and remains an important issue to resolve today.

The compensation reservoirs of Deep Hayes and Tittesworth were constructed by the former Staffordshire Potteries Water Board and were required to augment dry weather flows through a number of mills established on the River Churnet, downstream of one of the Board's first groundwater developments at Wall Grange.

In 1949, Tittesworth Reservoir was enlarged for direct public supply to Stoke district. More recently, in 1979, the Deep Hayes Reservoir was abandoned due to safety concerns and three smaller pools now form the focus of the Deep Hayes Country Park. The proportion of augmentation flow requirement lost from the former reservoir has to now be provided from an alternative source. Investigations have been carried out to assess the potential for local borehole supplies from Namurian gritstones to yield these compensation flows. A formalised operating rule now needs to be agreed, which also takes into account the requirements of British Waterways canal feeders.

The Caldron Canal obtains its water from the Churnet below Leek and the Stanley Reservoir at the headwaters of the Stanley Brook (itself a tributary of the Endon Brook). Stanley Reservoir causes a loss of water resource to the Churnet catchment as the water fed to the canal travels west and out of the area. The water feeding the canal from the Churnet eventually re-enters the river system as both the river and the canal combine in the Consall/Frogall area.

Tittesworth Reservoir continues to be used for public supply, together with a number of important groundwater sources. The majority of the water abstracted now by STW Ltd is exported to the Potteries and represents a significant net loss from the Churnet catchment. Groundwater development from the Sherwood Sandstone aquifer has also continued, to a point where abstractions are now equivalent to the total assessed groundwater resource. As a consequence, there is now little or no natural baseflow support to the rivers flowing across the aquifer during protracted dry weather. This underlines the importance of the compensation discharges in maintaining downstream flows at environmentally acceptable levels, to meet effluent dilution and fisheries needs.

A wide ranging review is required to secure improved conjunctive use of the groundwater and surface water supplies. This would seek to minimise winter overflows from Tittesworth Reservoir, allowing periodic resting of the boreholes and recovery in groundwater levels and baseflow support. Compensation requirements and control points need to be reassessed to achieve optimum balance between the use of water resources and protection of the water environment.

2.1.10 Conservation, landscape and heritage resources

2.1.10.1 Countryside Character Areas & Natural Areas

A character map of England, produced by the Countryside Agency and English Nature with the support from English Heritage, spits the countryside into 181 different 'Character Areas' and 120 different 'Natural Areas'. These areas have been identified on the basis of local distinctiveness in geology, landscape character, wildlife habitats, historical influences and natural features.

The landscape of the Dove catchment falls mainly into four of the landscape character areas: See Map 11.

- 52 White Peak
- 53 South West Peak
- 64 Potteries and Churnet Valley
- 68 Needwood and South Derbyshire Claylands

with two further character areas defining small areas north of Burton and north-east of Ashbourne:

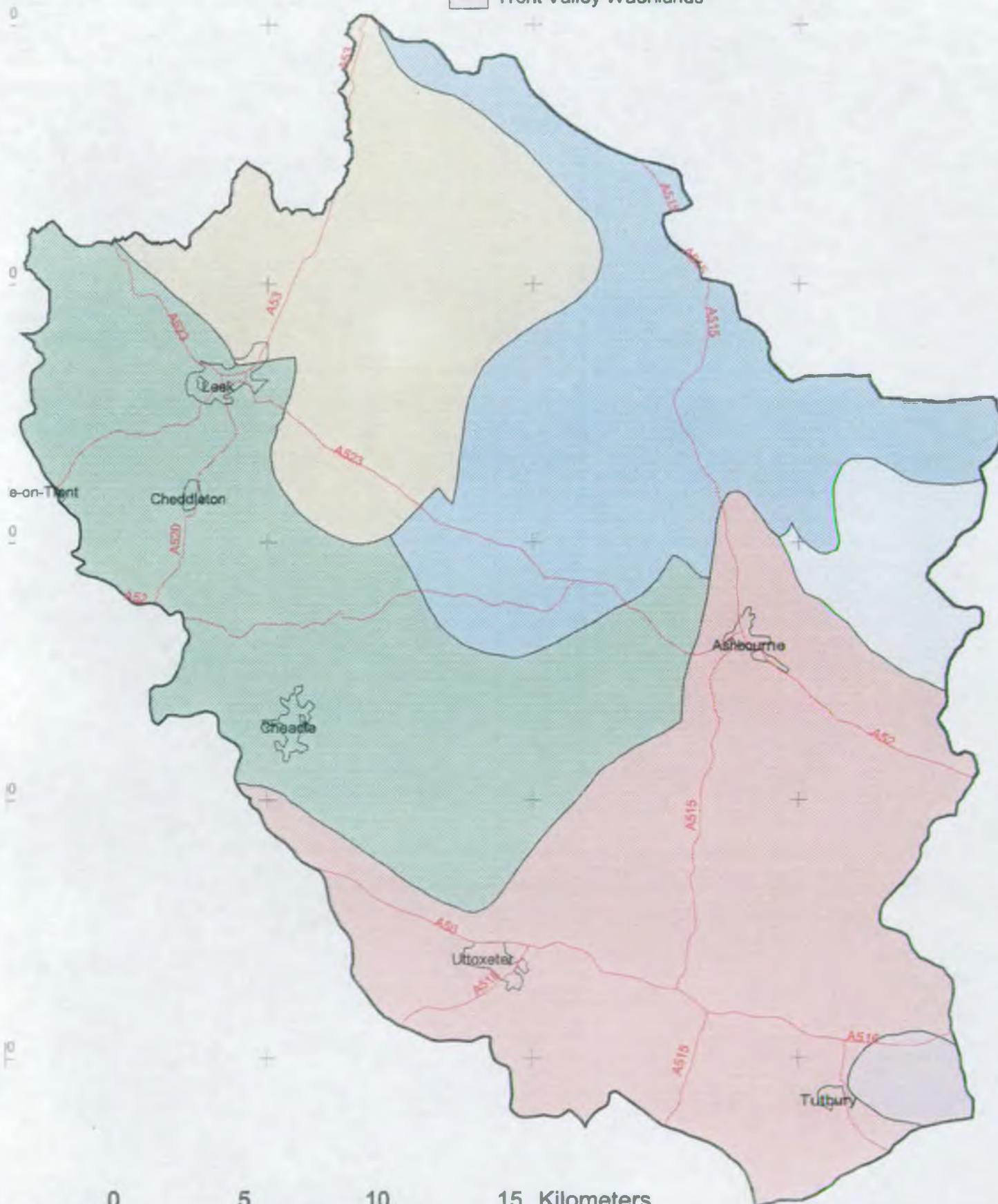
- 50 Derbyshire Peak Fringe and Lower Derwent
- 69 Trent Valley Washlands (CoCo), Trent Valley and Rises (EN).



ENVIRONMENT
 AGENCY

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- Dove Boundary
- A Roads
- Urban Areas
- Character Areas**
 - Derbyshire Peak Fringe & Lower Derwent
 - White Peak
 - South West Peak
 - Potteries & Churnet Valley
 - Needwood & South Derbyshire Claylands
 - Trent Valley Washlands



Staffordshire and Derbyshire County Councils, together with various District Councils, are currently refining the methodology to further detail the character areas. The Environment Agency has been working with consultees to ensure it has the information it requires to carry out its duties to protect and enhance landscape features associated with rivers and water-related elements of the LEAP area. A brief description of the main character areas follows.

White Peak

The White Peak is a distinctive area of Carboniferous limestone forming a gently rolling plateau dissected by steep sided dales, the most well known of which is Dovedale. The karst scenery and spectacular caves are notable features. Grassland, scrub, surviving woodland and exposed rock habitats add to the spectacular scenery and are important ecological habitats. The natural woodland has been largely cleared and limestone walls and shelterbelts define and protect highly productive meadows and permanent pasture. The process of enclosure resulted in small walled fields which are characteristic of the area. Lead mining has also resulted in distinctive field patterns and small hillocks of waste material. Active aggregate quarries dominate the landscape to the west. Nucleated stone villages are linked by crest and valley roads, some of Roman origin.

South West Peak

Folding and faulting of gritstones and shales followed by dissection by watercourses has produced a varied and often dramatic landscape. High altitude and heavy rainfall have helped create acidic soils dominated by moorland vegetation. Fast flowing streams have cut deep valleys, in some of which, ancient semi-natural woodland survive. The Dove, Manifold, Churnet and Hamps rivers rise in this area.

The highest parts of the moorland are remote, criss crossed by pack-horse routes incised by heavy usage. The wild, exposed area north of Leek is well known for the gritstone edge of the Roaches. It is further isolated by the military training area.

Small villages, hamlets and isolated farmsteads are scattered throughout the lower land, often clustered in the valleys where hedged meadows, rush pastures and more productive farmland are found. At higher levels the fields are enclosed by gritstone walls.

Potteries and Churnet Valley

The Churnet Valley runs through a smoothly undulating upland pasture landscape to which it is linked by short, steeply incised side valleys. These well wooded valleys, with remnants of ancient sessile oak woodland, have attractively sited small villages, scattered farmsteads, hamlets and buildings indicative of the former industrial heritage, such as stream-side mills and lime kilns. In the lower valley, the parklands at Alton Towers and Wootton add to this rich and visually complex landscape. Above the valley on its northern side, hedges gradually give way to drystone walls and stone farmhouses linked by narrow winding lanes. The fields become larger and take on the rectilinear pattern of eighteenth and nineteenth century enclosure.

Needwood and South Derbyshire Claylands

The area consists of a rolling plateau divided by the wide, shallow valley of the River Dove. In the south, the landscape is characterised by areas of deciduous and coniferous woodland, straight roads and rectilinear enclosure fields bounded by hedgerows. The remnants of the semi-natural woodlands include core fragments of the Needwood Forest on heavy, poorly drained soils.

The northern prominent wooded scarp above the Dove becomes gently rolling and less wooded, dissected by numerous small valleys. Much of the former oak woodland dominated parkland character remains although it is becoming increasingly used for agriculture.

On higher ground, the dispersed more recent settlements and farmsteads occur mostly around road junctions. To the south, red brick villages and sandstone churches lie on the edge of forest areas and in the fertile northern stretch of the River Dove valley.

Trent Valley Washlands

Where the Dove meets the Trent, it enters an area of flat, broad valleys, contained by gentle side slopes, dominated by large rivers. There is an increasing extent of urban development and extended transport corridors mixed with pasture and arable farmland. Riverside pasture, unimproved meadows, mixed hedgerows and riparian scrub are increasingly rare features.

Derbyshire Peak Fringe and Lower Derwent

An area around Carsington Reservoir and the Henmore Brook falls within the Derbyshire Peak Fringe. As woodland is generally sparse within the predominantly pastoral landscape, the hedges at lower altitudes make a significant contribution to the character of the area.

The new Countryside Agency will be publishing regional volumes containing both Character Area descriptions, more detailed maps and photographs.

2.1.10.2 Areas of Outstanding Natural Beauty

Areas of outstanding Natural Beauty are designated by the Countryside Agency on the basis of the quality and character of their landscapes in the national context. The primary objective of designation is to conserve the natural beauty of these landscapes. There are no AONBs within the plan area.

2.1.10.3 Special Landscape Areas

Landscapes of strategic (county) importance are identified in Structure Plans and Local Plans as Special Landscape Areas. These are protected by planning policies and priority is given by Local Planning Authorities to conserving and enhancing the natural beauty of the landscape. There are no Special Landscape Areas within the plan area.

2.1.10.4 Sites of Special Scientific Interest, National and Local Nature Reserves

SSSI's are sites of special interest for their flora, fauna or geological or physio-graphic features. There are 28 SSSI's in the Dove catchment, which are generally managed by private owner occupiers and by conservation groups as reserves. English Nature maintain consultation areas of up to 2Km around SSSI's to ensure that the special interest of the designated sites is not threatened. The following is a list of SSSI's in the area. See also Map 12.

Name	NGR
Combes Valley	SK 005 525
Churnet Valley	SJ 992 476 & SK 033 476
Caldon Dales	SK 093 489
Caldon Low	SK 077 492
Cauldon Railway Cutting	SK 077 497
Chrome and Parkhouse Hills	SK 075 671
Colshaw Pastures	SK 048 676
Ballidon Dale	SK 205 555
Bath Pasture	SK 063 459
Bees Nest and Green Clay Pits	SK 240 547
Dimmings Dale and The Ranger	SK 044 435 to SK 058 433, SK 053 434 & SK 060 430
Dove Valley and Biggin Dale	SK 157 506 & SK 147 595
Forest Banks	SK 120 284
Froghall Meadows and Pastures	SK 023 469
Hamps and Manifold Valley	SK 100 540
Hilton Gravel Pits	SK 249 315
Hipley Hill	SK 211 546
Hulland Moss	SK 250 462
Kirkham's Silica Sandpit	SK 216 542
Leek Moors	SK 020 650
Long Dale and Gratton Dale	SK 202 596
Moss Carr	SK 073 659
Parwich Moor	SK 175 579
Stanton Pastures and CuckooCliff Valley	SK 128 473
Swineholes Wood & Black Heath	SK 048 504 & SK 054 498
Thorncliffe Moor	SK 024 586
Wetley Moor	SJ 931 485
Whiston Eaves	SK 037 463 & SK 037 461

National Nature Reserves (NNRs) are sites of national importance for the conservation of the wildlife or geological and natural features, and are owned and managed by English Nature.

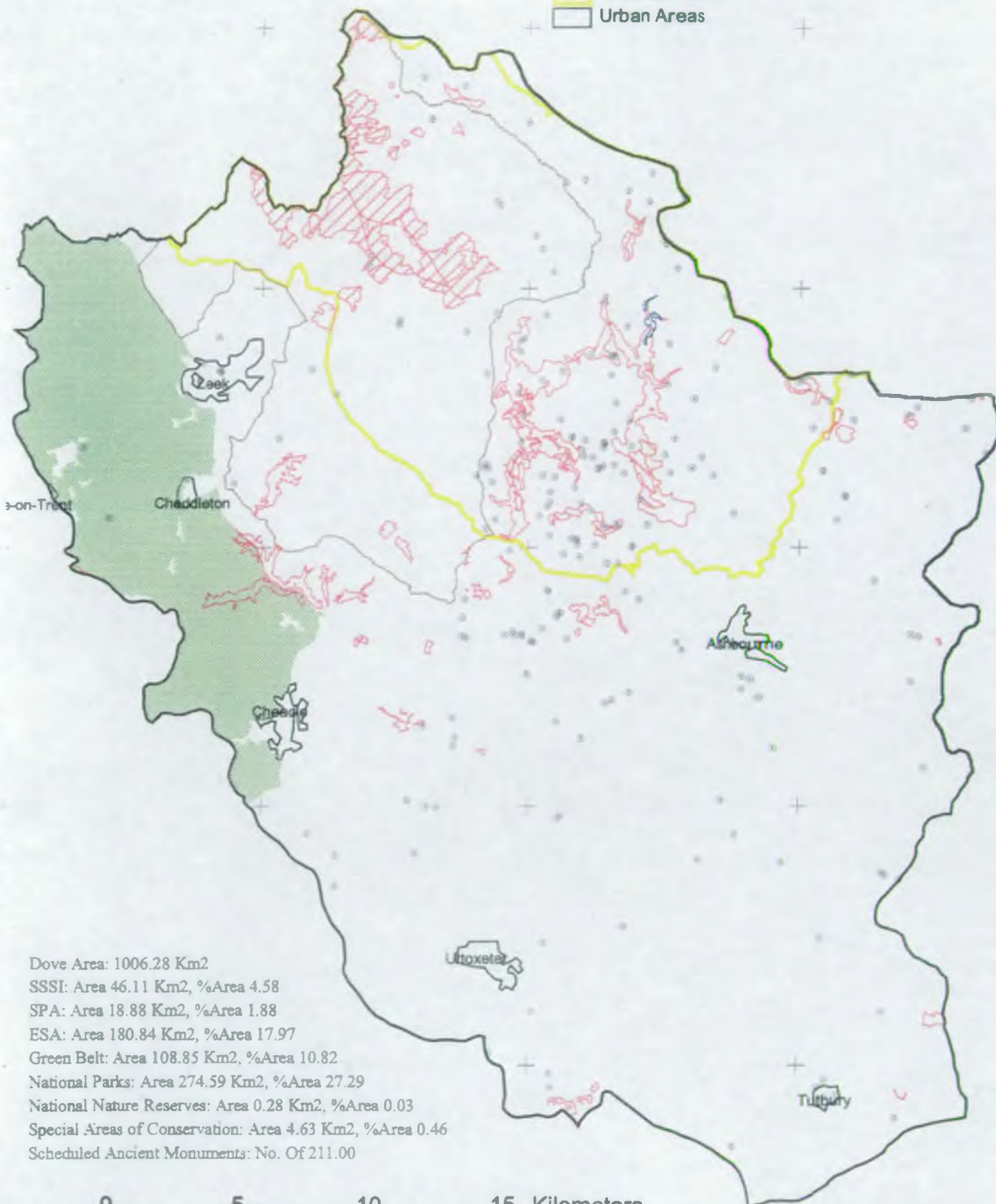
Local Nature Reserves are designated by local authorities in consultation with English Nature under Section 21 of the National Parks and Access to the Countryside Act 1949. To qualify for LNR designation, the land must be of special wildlife value locally and be land in which the local authority has a legal interest.

**Environment Agency Plan
12 : Protected Areas**



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- Dove Boundary
- Scheduled Ancient Monuments
- National Nature Reserves
- Sites of Special Scientific Interest
- Environmentally Sensitive Areas
- Special Areas of Conservation
- Special Protection Areas
- Green Belt
- National Parks
- Urban Areas



Dove Area: 1006.28 Km²
 SSSI: Area 46.11 Km², %Area 4.58
 SPA: Area 18.88 Km², %Area 1.88
 ESA: Area 180.84 Km², %Area 17.97
 Green Belt: Area 108.85 Km², %Area 10.82
 National Parks: Area 274.59 Km², %Area 27.29
 National Nature Reserves: Area 0.28 Km², %Area 0.03
 Special Areas of Conservation: Area 4.63 Km², %Area 0.46
 Scheduled Ancient Monuments: No. Of 211.00

Non-Statutory nature conservation sites (SINCs)

There are 350 sites within the plan area.

2.1.10.5 Regionally Important Geological Sites

There are 13 RIGS within the plan area. These are:

Name	NGR
Snelston Quarry	SK 154 413
Brook Farm	SK 159 425
Old Grammar School	SK 177 466
Punches Dumble	SK 192 482
Hulland Hollow Brook	SK 245 463
Hurley Hill	SK 210 544
Bank House	SK 213 524
Sandlow Quarry	SK 213 508
Hopton Vent	SK 258 535
Yokecliffe Hopton	SK 265 537
Foxcloud Plantation	SK 268 538
Hopton Armshouses and Twigs Plantation	SK 262 534
Hopton Tunnel	SK 265 547

2.1.10.6 RSPB Reserves

There is one RSPB Reserve within the catchment, this is at Coombes Valley Reserve.

2.1.10.7 Wildlife Trust Reserves

There are eight Staffordshire Wildlife Trust and nine Derbyshire Wildlife Trust Reserves in the Dove catchment.

2.1.10.8 Agricultural Incentive Schemes

Part of the upland area of the Dove catchment includes the South West Peak Environmentally Sensitive Area (ESA) designated by MAFF within which grant aid is available to farmers to maintain traditional work practices and to farm more extensively. The extent of the ESA can be seen on Map 12.

The Countryside Stewardship Scheme

The Countryside Stewardship Scheme is a MAFF scheme which makes payments to farmers and land managers to improve the natural beauty and diversity of the countryside. Its objectives are to:

- Sustain the beauty and diversity of the landscape;
- Improve and extend wildlife habitats,
- Conserve archaeological sites and historic features;
- Improve opportunities for countryside enjoyment;

- Restore neglected land or features;
- Create new habitats and landscapes;

Each county also has its own priorities and local scheme objectives. For more information on this scheme contact your nearest MAFF Regional Service Centre.

2.1.10.9 Archaeology and cultural heritage

The cultural heritage of the Dove catchment is extremely rich and diverse. The nature of the landscape and geology has both influenced human activities and been changed by them. Human artefacts dating from 9000BC have been discovered in the Manifold Valley and since then earthworks, burial mounds, settlement patterns, communication corridors and land uses have shaped a complex landscape, which continues to evolve.

The landscapes of the area range from moorlands and steep sided wooded valleys to broad river valleys that are well known today. A predominantly agricultural land use resulted in the settlement and field patterns that are characteristic of the area, with drystone field boundaries on higher ground and hedgerows on lower lying land. Much of the area falls within the Peak District National Park. In addition, many towns and villages contain Conservation Areas. It is this mix of semi-natural, highly managed and built landscapes full of man-made features that provides the high quality and rich heritage of the area.

Bronze age burial mound and ancient earthworks have been found in the Manifold Valley. A prehistoric flint working site is known near Throwley Cottage and prehistoric, Roman and Anglo-Saxon finds have been made in a number of caves. A Neolithic burial mound was also found at Bridestones Burial Chamber near Leek. Bronze Age finds have also been made at Rocester.

Lead found in the area was important to the Romans. Rocester, near Uttoxeter was a Roman fort with an associated civil settlement and many Roman finds have been made there.

Mediaeval settlement of the area had an enormous impact on the landscape. Mediaeval and post-mediaeval ridge and furrow and strip lynchets survive in abundance. Ancient woodland is thought to have been partially managed from the mediaeval period. The remains of Tutbury Castle, dating from the eleventh century, are an imposing feature in the landscape.

Increasing settlement and wealth is reflected in the many sandstone churches built across the area. Market towns sprang up across the area, with regular agricultural markets still held at Uttoxeter and Leek.

The custom of well-dressing, now enjoying a revival, is believed to have begun in 1350 and ceremonies take place in a number of villages in the area during the year.

Walls and hedgerows reflect the widespread impact of the enclosures and much of the existing field pattern was established at that time.

The industrial revolution has left many marks on the landscape. The wooded hillsides provided charcoal for the metal industries based in the valleys and stream side mills and lime kilns are a feature of the Churnet valley. Railways were laid and the Caldon Canal, terminating at Froghall Wharf, was cut. Rudyard Lake was constructed as a feeder reservoir for the canal and Tittesworth Reservoir was built to serve mills lower down the valley. Leek became famous for its silk and other textile mills and is still a centre of production today.

Many large houses and gardens were built with the wealth generated by the pottery and coal industries. These include Wooton Hall and Alton Towers, a Grade I Listed Building and registered Park and Garden. The remains of an iron-age hill fort also lie partly within the grounds. Alton Towers is now a major tourist attraction due to the theme park.

The recent construction of the new A50 M1-M6 link has increased pressure for large-scale development of business parks, industrial estates and housing estates. This kind of development tends to dominate the landscape and use a range of imported and non-local materials that do not relate to the cultural heritage of the area. The associated lighting and reshaping of the landscape further reduce the quality of the area. The nature of the landscape previously regulated the size of development and disguised its impact, hiding mills in valley bottoms and preventing the clearance of forests for agriculture. The cultural heritage of the area requires protection not only by means of statutory designations but also outside those areas.

2.1.10.10 Scheduled Ancient Monuments

These are key sites for archaeology, designated nationally by the Secretary of State for National Heritage, through English Nature and CADW. They are designated under the Ancient Monuments and Archaeological Areas Act 1976.

2.1.10.11 National Trust

The National Trust was founded in 1895 by three Victorian philanthropists. They were concerned about the impact of uncontrolled development and industrialisation. The Trust was set up to act as a guardian for the nation in the acquisition and protection of threatened countryside and buildings.

Map 13 shows the National Trust Property in the plan area.

2.1.10.12 National Park

A National Park is a large area of beautiful countryside which is specially protected so that it remains beautiful and can be enjoyed now and in the future. British National Parks have spectacular landscapes in which many people live and work. They also contain traditional industries including forestry, quarrying and water catchment.

The Peak District National Park was Britain's first National Park. It covers 1438 square kilometres at the southern tip of the Pennines. Map 12 shows the extent of the Peak District National Park.



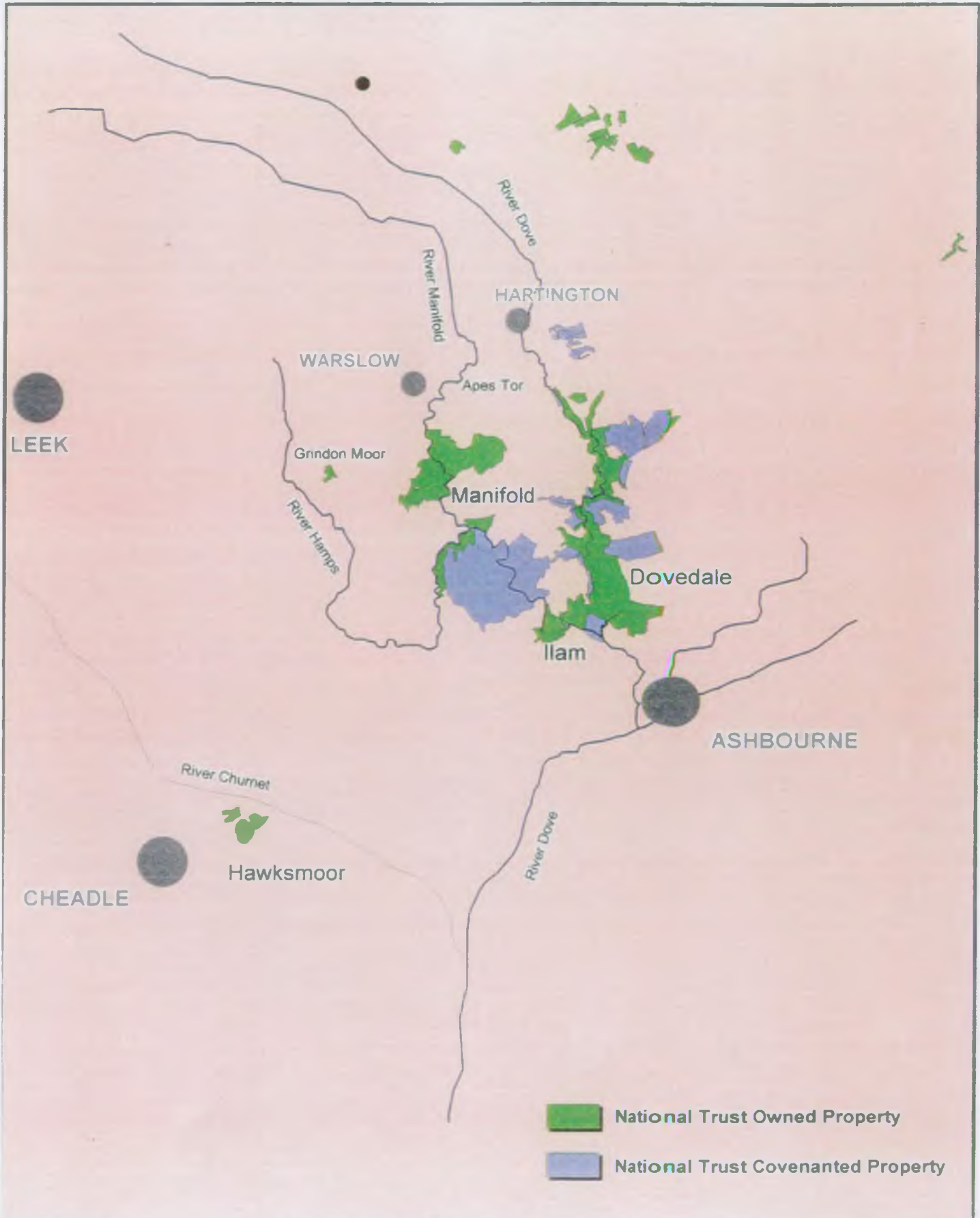
THE NATIONAL TRUST
EAST MIDLANDS REGION

Map 13 National Trust Property



25/11/1995
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Ian J White East Midlands Regional Office, Clumber Park Stableyard, Worksop, S80 3BE. ALD853941



2.2 The Status of Key Biological Populations, Communities and Diversity

2.2.1 Biodiversity Action Plans

"Biodiversity" is simply a new term meaning variety of life, and biodiversity conservation is what has long been known as nature conservation. The importance of biodiversity conservation has been recognised internationally by the drawing up of a Biodiversity Convention intended to ensure the conservation of the full range of existing plant and animal species, their genetic variation and the ecosystems in which they live.

2.2.1.1 Biodiversity Convention

The Convention on Biological Diversity was one of the major initiatives stemming from the 'Earth Summit' in Rio de Janeiro in 1992. The United Kingdom was one of 150 signatories to the convention. Signatories recognised that action must be taken to halt this global loss of animal and plant species and genetic resources and that each country has the primary responsibility to conserve and enhance biodiversity within its own jurisdiction. The Convention agreed to 'develop national strategies, plans and programmes for the conservation and sustainable use of biological diversity', and to share resources to help implement such programmes.

2.2.1.2 UK Biodiversity Action Plan

The Government's response to the Biodiversity Convention, 'Biodiversity: The UK Action Plan', published in 1994, set out a broad strategy for conserving and enhancing wild species and habitats in the United Kingdom for the next 20 years.

One of the main outcomes of the UK Action Plan was the setting up of the UK Biodiversity Steering Group. The UK Steering Group Report published in December 1995 and endorsed by the Government in May 1996, contains the following key components:

- Developing costed targets for our most threatened and declining species and habitats;
- Establishing an effective system for handling the necessary biological data at both local and national level;
- Promoting increased public awareness of the importance of biodiversity, and broadening public involvement and;
- Promoting Local Biodiversity Action Plans as a means of implementing the national plan.

2.2.1.3 Biodiversity Action Plans

Local Biodiversity Action Plans are seen as a means by which the UK Action Plan can be implemented. They focus resources to conserve and enhance biodiversity by means of local partnerships, taking account of both national and local priorities.

The Dove catchment encompasses three Local Biodiversity Action Plans. The Staffordshire BAP was published in November 1998; it includes action plans for certain species and habitats of particular concern to the Agency, such as otter, water vole, salmon, white-clawed crayfish, black poplar, wet woodland and rivers and streams. The Mid-Derbyshire BAP has been produced in two parts, Part 2 appearing in April 1998. The Agency has been involved with the preparation of both these BAPs. The Peak District BAP is currently being drafted.

2.2.2 Habitats

The national importance of habitats in terms of nature conservation has been assessed by the UK Biodiversity Steering Group, which was set up by the Government in 1994 as part of its response to the 1992 Rio Earth Summit.

The group have produced a list of key habitats of which 9 are present in the plan area. These habitats are those which are under threat, are important for key species, or which the UK has international obligations to protect.

The UK Biodiversity Steering Group Report produced lists of species which are either globally threatened or have declined nationally by over 50% in the last 25 years. The short list contains 116 species for which priority action plans were produced in an attempt to stabilise and increase their populations. The middle list contains a further 300 species for which action plans have been produced during 1998. There is also a long list which, although not comprehensive, contains species of conservation concern. 8 short list and middle list species occur in the plan area.

The **Key Habitats** in the plan area are reedbeds, blanket bog, other wetlands, standing open water, rivers, streams and canals.

Reedbeds

Reedbeds are wetlands usually dominated by stands of common reed (*Phragmites australis*) where the water table is at or above ground level for most of the year. They frequently incorporate areas of open water, ditches and small areas of wet grassland, with carr woodland often being found around the drier edges.

Reedbeds are a nationally scarce habitat and one of the most important for birds. In the Dove catchment, reedbed habitats are generally small located within the river valleys eg. in gravel pits. The objective of the Staffordshire and Derbyshire BAP's is to maintain all current reedbed sites and create more areas of reedbed throughout each county.

Blanket bog

Blanket bog is a type of bog, typical of flat or moderately sloping areas in very wet climates. This type of wetland is common in the Pennines and supports many species of plant as well as species like golden plover and snipe.

Other Wetlands

A range of other wetlands including Carr Woodland (wet woodlands of alder and/or willow) and marsh, occur in the Dove LEAP area. These are the remnants of much more extensive habitats and support numerous very rare species.

Standing open water

Standing open waters include natural systems such as saline lagoons, lakes and pools as well as man-made waters such as ditches and dykes, ponds, reservoirs and gravel pits, ranging from very later water bodies to small features (usually ponds) a few metres across.

In the Dove LEAP area these range from large reservoirs eg. Tittesworth, Carsington and Rudyard which are important for over-wintering waterbirds, to small ponds in the Dove Valley which are of vital importance for Great Crested Newts.

Rivers and streams

Rivers and streams in their natural state are dynamic systems which are continually modifying their form. Both of these flowing surface water systems contain a variety of in-stream habitats (e.g. riffles, pools, margins) and bankside habitats (e.g. shingle banks, meadows, woodland, marshland), which support a diverse range of flora and fauna. The rivers and streams in the Dove catchment also link fragmented habitats throughout the area and are also highly valued as a fisheries resource and as an important landscape and historic feature.

The rivers and streams in the Dove catchment are under increasing pressure from a variety of pressures, such as abstraction, development and agriculture.

Canals

Canals can be very important wildlife corridors and often connect various different types of wetland. In Staffordshire they have often been constructed along river corridors and help sustain links between running and standing water habitats. The Caldon Canal is the only canal within the Dove catchment.

Black Poplar

The relict population of the British sub-species of the black poplar is intimately associated with river corridors, having been formerly widespread and common in floodplain forests. The maintenance of remaining trees and re-establishment of populations is closely linked with Agency activities.

The black poplar is the rarest tree in Britain. Its status is such that an action plan for the conservation of the species was drawn up by the Black Poplar working Group in 1994, and it is being considered for English Nature's Species Recovery Programme.

The Species Action Plan has targeted the Dove Valley as an area of importance for conservation of the Black Poplar

2.2.3 Species

The **Key Species** in the plan area are water vole, otter, pipistrelle bat, bittern, reed bunting, great crested newt and white clawed crayfish.

Salmon

Atlantic salmon is a globally threatened species, listed in the Biodiversity Steering Group Report. There has been a global decline in salmon stocks although the salmon was once widespread in the Trent catchment. Poor water quality and navigation weirs in the River Trent contributed to the decline of salmon populations. There have been improvements in the

water quality of the Trent and a salmon re-introduction programme has begun utilising the River Dove as spawning grounds.

Water vole

There are two species of water vole in Europe, only one of which occurs in Britain. Favoured habitats include well vegetated banks of ditches, streams, rivers, canals, dykes and ponds. They are herbivores, primarily feeding on the lush waterside vegetation, including grasses, sedges, rushes and reeds which they also use as cover against their many predators. Water voles build nests in bankside vegetation as well as digging tunnels along watercourses and in other suitable areas.

Water voles live in colonies and are territorial. During a breeding season which lasts from March to October, a female may produce two to five litters each of between five and eight young. As food supplies diminish during wintertime, they are less active, spending the majority of time underground.

Nationally water voles have been undergoing a serious long term decline with a predicted total loss from 94% of its former sites by the year 2000. The most significant and viable colonies in Staffordshire survive in built up areas along less intensively engineered and obscure watercourses unvisited by breeding mink which tend to shy away from areas disturbed by human proximity.

Surveys carried out by Staffordshire Wildlife Trust during 1996 and 1997 have confirmed a decline. The strongest and most stable colonies have been identified along the River Tean and the headwaters of the Dove and Manifold systems. Where suitable habitat and burrowing opportunities are still available, good populations can still be found throughout the canal networks. Towns within the plan area retaining notable populations of water vole are Uttoxeter and Leek.

Otter

Otters are members of the weasel family, the Mustelidae, which includes badgers, polecats, stoats and mink. There are a number of species of otter, but only one found in Britain, the Eurasian otter. They are semi-aquatic animals holding territory along a stretch of river, with dog (male) otters capable of travelling over forty kilometres in a twenty four hour period. Analysis of otter spraints in the plan area have shown that fish form the bulk of their diet with small mammals, birds, frogs and crustaceans as important secondary and, often seasonal, prey items.

The otter underwent a dramatic population decline in lowlands areas of the UK between the 1950's and 1970's effectively disappearing from Staffordshire and Derbyshire in the 1970's. The otter is currently staging a comeback as a result of legal protection and the banning of a highly toxic insecticide and built up in the food chain and affected breeding success.

A comprehensive survey of otter in the Dove catchment was undertaken in 1997. This showed that Staffordshire constitutes the key geographical link area for otter re-colonisation between the Upper Severn and Upper Trent river catchments and is therefore extremely important for the future re-colonisation of a considerable area of England.

Fish populations in the middle reaches of the Rivers Churnet and Tean have been detrimentally affected in the past by the impact of sewage and trade effluents. However these populations should show signs of recovery with the introduction of tighter consent conditions on some effluent discharges.

The lowland reaches of the catchment generally provide good mixed and coarse fisheries, the lower Dove being of exceptional quality and noted for its barbel populations. Still water fisheries are widely dispersed but day ticket opportunities are limited. Nevertheless the reservoirs at Tittesworth and Carsington offer day ticket fishing for rainbow and brown trout.

Introduction of Salmon to the River Dove

In October 1998, 150,000 salmon parr were re-introduced to the River Dove downstream of Rocester. The Agency is seeking to establish the 'Trent Salmon Trust' to progress the re-establishment of the species.

Concerns have been raised by trout angling interests on the river regarding competition between juvenile salmon and brown trout, and as a result of this, a possible decline in the quality of brown trout fishing. In recognition of these concerns, the introduction of salmon parr carried out in 1998 was undertaken downstream of Rocester weir, a barrier approximately delineating the game fishing interests in the upper river and mixed / coarse fishing interests in the lower river.

It is intended to continue the annual introduction of salmon parr and this will continue to be downstream of Rocester weir. Research on the River Teme detailed by North (1986) demonstrated that the creation of juvenile salmon populations had no detectable detrimental effect upon resident trout populations. Density-independent factors rather than competition governed the fluctuations in abundance and structure that occurred in wild trout populations. The presence of an anadromous species would provide a net contribution to food resources in the river through eggs and juveniles that may enhance existing trout and grayling populations.

The Environment Agency perceives no threat to brown trout populations in the upper Dove from the return of salmon, and the return of a species lost relatively recently from the catchment would greatly enhance the conservation value of the river.

2.2.5 Invasive species

Invasive species are generally introduced, foreign species, that cause a variety of problems for native species.

Plants

Japanese Knotweed, is native to Japan, Taiwan and Northern China and was introduced to Europe as an ornamental and fodder plant in the early 19th Century. In Britain it first became naturalised in South Wales, growing on coal tips as early as 1886. It has since become widely established throughout the British Isles.

Japanese Knotweed is a highly invasive plant, it can colonise most habitats such as river banks, woodlands, grassland and coastal areas. It is also able to grow through walls, tarmac and concrete.

Himalayan Balsam, is native to the Western Himalaya. Since its introduction in 1839 it has spread throughout the British Isles, particularly in recent years. This plant is the tallest annual plant found in the British Isles, growing to more than 2-3m in height. Each plant can produce 800 seeds which are released explosively from seed pods, travelling distances of up to 7m. The seeds, which are transported by water, can remain viable for up to 2 years. Japanese Knotweed and Himalayan Balsam are widely distributed throughout the Dove catchment.

Giant Hogweed, native of the Caucasus mountains between Russia and Turkey, introduced to Britain as an ornamental plant in the 19th Century. It is now widespread throughout the British Isles especially along river banks but restricted to a few areas in the Dove catchment.

The Agency has produced a leaflet on how to prevent the spread of these plants.

Invertebrates

The introduction of the American signal crayfish, *Pacifastacus leniusculus*, into the UK has undoubtedly contributed to the decline in numbers of our only species of native crayfish, *Austropotamobius pallipes*. Apart from direct competition between the two species, the signal crayfish is a vector for the fungus *Aphanomyces astaci*, more commonly referred to as the crayfish plague fungus. This has wiped out populations of native crayfish in many rivers.

Incidents of crayfish plague were first recorded in the 1980's, and thirteen outbreaks have been confirmed by staff at the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), formerly the Fish Disease Laboratory. In twelve other cases there has been no confirmation but plague has been suspected as the cause of crayfish kills. No outbreaks have been reported since 1993, but it is believed that signal crayfish can carry the plague indefinitely and it is highly likely that the plague is still present in our waters.

2.2.6 Indicator species

Indicator species are those that when present or absent are indicative of a particular type of habitat. The following table shows examples of such species.

Table 7- Indicator species in the Dove catchment

Species	Increase / Decline	Reason
Otter	Increase	Improved water quality Good source of food Reduction in aquatic pesticide levels
Salmon	Increase	Improved water quality
Barn Owls	Decline	Habitat degradation
Cormorants	Increase	Withdrawal of certain pesticides and reduction in persecution
Predatory species - polecats, buzzards	Increase	Reduction in their persecution by humans
Farmland birds and bats	Decline	Habitat degradation, particularly in lower reaches of the Dove
Moorland Waders – Snipe, Curlew, Lapwing	Decline	Agricultural drainage and overgrazing in higher reaches of Dove catchment

2.2.7 River Habitat Surveys

The following information provides summary statistics for the Dove catchment derived from the river habitat survey database. The reliability of the data depends on the number of reference sites within the LEAP boundary, the following grading has been given.

Number of Sites	Reliability
0-14	Unreliable
15-30	Quite reliable
Over 30	Reliable

Number of sites	31
% Upland sites:	19
% Lowland sites:	81
% Sites over 10m width:	39

Impacts (% Occurrence)	
Culverts:	3
Weirs:	29
Outfalls:	19
Roadbridges:	27
Fords:	10
Dredging:	2
Mowing:	10
Enhancement:	0
Poaching:	43

Invasive species (% Occurrence)	
Giant Hogweed:	6
Japanese Knotweed:	6
Himalayan Balsam:	26

Special Features Count	
Braided Channel	3
Debris dam	1
Artificial open water	4
Natural open water	1
Water meadow	1
Bog	1
Carr	3
Marsh	2

Landuse (% Extensive Occurrence)

Woodland:	9
Rough pasture:	8
Grassland:	55
Tilled land:	6
Semi rural:	7
Urban	18

Modifications (% Extensive Occurrence)

Extensive resectioning:	0
Extensive reinforcement:	10
Extensive embankment:	0

Water / Habitat Quality (% Sites)

GQA (A):	26
GQA (F):	0
Semi Natural:	45
Significantly Modified:	13

Water / Habitat Quality (Statistics)

Median GQA:	B
Median HMS:	4
Median HMI:	2
Median HQA:	46

Survey work during 1996 and 1997 has shown that otters are now re-colonising the Upper Trent area, in the plan area this is occurring along the River Dove from Uttoxeter to Burton-on-Trent.

Pipistrelle bat

The pipistrelle bat is found in all types of countryside except in highly exposed regions. It roosts mainly in buildings, but tree-holes and bat boxes are also used. Large nursery colonies of up to one thousand bats are formed, particularly in buildings. The bats emerge to feed about twenty minutes after sunset and often hunt at mid-tree canopy height, over or near water with an erratic flight path. Food consists mainly of small insects taken in flight.

The Pipistrelle is the most abundant and widespread bat in the UK and the most common of ten species occurring in Staffordshire. However, a survey suggests that it has undergone a significant decline in numbers during recent years. The National Bat Colony Survey has monitored pipistrelle populations nationally since 1978 and indicates a population decline of approximately 70% between 1978 and 1993.

The combined data of the English Nature bat colony survey and nearly thirty years of field observations indicates that there is an affinity for urban areas in the county.

Reed bunting

The reed bunting is intimately associated with upland riverine habitats and has been selected as a priority species for conservation by the Environment Agency. In Britain and Ireland, reed buntings are widespread although absent from some higher upland areas, notably Scotland.

There was a crash in numbers after the severe winters of 1961/62 and 1962/63 and then a steady recovery with high populations levels to the mid 1970's. A decline started in 1976 or 1977 and was more marked in the late 1970's and early 1980's, partly due to the severe winters of 1978/79 and 1982/83 but believed to be exacerbated by farmland changes, notably and increased use of herbicides. Since 1983, populations have been generally low compared to those in the mid 1960's but stable.

Reed buntings favour wetland edges where there is a good growth of aquatic emergent vegetation such as reeds. They also like to perch and feed on low shrubs or willows.

Great crested newt

In Britain there are three species of newt, great crested, smooth and palmate. The great crested newt, which can grow to sixteen centimetres long, is the largest. On top it has dark, often black, warty skin, speckled with tiny white spots. Its belly is usually orange or yellow with blotches, a warning to would-be predators that they are poisonous to eat. In springtime, male great crested newts develop a high, wavy crest along their backs, and another along their tails.

Newts spend much of their year on land, however. towards the end of winter adult newts return to water to breed. Newt eggs are laid on underwater leaves near the water margin. After four weeks the egg hatch as tadpoles which then take a further three months to develop into a young newt capable of leaving the water. At this time the young newts will leave the water to spend between one and three years in surrounding terrestrial habitat while they become sexually mature.

Great crested newts require extensive areas of terrestrial habitat as well as standing water in order to survive; for example, a viable population of around two hundred and fifty newts requires a suitable breeding pond and about one hectare of good terrestrial habitat. Moreover, adult newts can travel some distance away from their breeding pond in search of suitable habitat and immature adults may disperse up to five hundred metres away from the pond.

There are known to be significant populations of great crested newts in the Dove valley but their full distribution is not well known.

White-clawed crayfish

There is only one native species of freshwater crayfish in Britain. The white-clawed crayfish tend to concentrate in areas of hard alkaline water. This species can be found in a wide range of wetland habitats, such as, rivers, streams, open water and quarry pools. However, its optimum habitats are watercourses with limited sediment, free of pollution and plenty of shelter in the forms of rocks, aquatic plants and tree roots. They are omnivores and feed largely on fish, invertebrate larvae, aquatic plants, snails and worms. Predators of white-clawed crayfish include other crayfish, some birds, fish and mammals.

The white-clawed crayfish is a species of global nature conservation concern. It has declined by 25% and 50% in Britain in the last 25 years due to competition by introduced species of crayfish eg. American signal Crayfish (*Pacifastacus leniusculus*). This non-native species can carry a fungal disease Crayfish Plague which can be passed onto the native population of crayfish thus adding to the decline of the native species. There is a need to assess the status of the introduced populations with a view to controlling and eradicating them. Three non-native populations have been identified in the Dove catchment so far. The American signal crayfish has been introduced by man into the UK and has brought the disease with it. The disease is spread through water, on fish, mud and damp angling tackle.

Native crayfish are known to be present in the Dove and some of its tributaries including the Hilton Brook and Henmore Brook and on tributaries of the River Churnet. Surveys are being carried out to determine a full distribution map.

2.2.4 Fisheries

Uniquely within the Trent catchment, the Dove and its tributaries include numerous high quality salmonid fisheries many of which are designated under the EC Freshwater Fisheries Directive. The River Dove has recently been re-stocked with 150,000 young salmon, this is part of a programme of restocking which will continue over the next few years. Brown trout and grayling are the dominant upland species and much of the main River Dove is restocked annually with brown and rainbow trout.

2.3 Compliance with standards, targets and classification

2.3.1 Air Quality Standards

2.3.1.1 Global issues – International and European standards

The Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, has now been ratified by over 100 countries and it aims to reduce and eliminate the use and emission of ozone-depleting substances. The Agency has regulatory responsibility for implementing and reporting on the Montreal Protocol for processes within its jurisdiction.

The emission of 'greenhouse gases' has increased substantially as a result of human activities, enhancing the natural greenhouse gas effect and leading to 'global warming' and climate change. The UN Framework Convention on Climate Change, 1993, forms the basis for international action to address the problem of climate change and it includes phased targets to reduce emissions of greenhouse gases to 1990 levels by the year 2000. At the 1998 Kyoto Climate Change Summit, the UK Government made further commitments to reduce emissions of carbon dioxide (CO₂) and other greenhouse gases by 5% overall from 1990 levels by 2008-2012.

Various European legislation is concerned with the control of air pollution. These include directives controlling air quality limits on sulphur dioxide and suspended particulates, nitrogen dioxide, lead and ozone monitoring. These will be replaced by a Framework Directive on Air Quality, which actually mirrors the current UK National Air Quality Strategy with limits, objectives and action thresholds.

The Agency, through its regulation of the most complex and potentially polluting process industries, is responsible for delivering government obligations under European legislation including the Large Combustion Plant Directive, and for industrial point and diffuse sources under the Oslo Paris Commission. Local authorities are responsible for the implementation of the UK National Air Quality Strategy. The Agency, as a statutory consultee, works with local authorities by providing information and advice on process under Integrated Pollution Control (IPC).

2.3.1.2 Local air quality and the UK National Air Quality Strategy

The strategy sets out a framework for improving air quality through standards and objectives, which implement requirements of the Environment Act 1995. It lists standards and guidelines that represent long-term objectives to protect health and the environment. Industries such as those operating combustion processes (waste incinerators, coal burning) are a potentially significant source of toxic organic micropollutants. The standards and objectives aim to facilitate compliance with international and European commitments for national emissions.

These controls will require local authorities to undertake a review of its air quality and make an assessment of its present and future air quality.

Air quality in the plan area is generally good and has been improving in recent years. This improvement is set to continue over the next decade as the new standards discussed above are implemented. The UK confidently expects to meet its existing international commitments for reductions in emissions of NO_2 , SO_2 and VOCs.

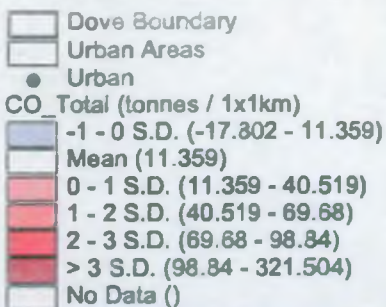
Important challenges and uncertainties do remain. For example, the recurrence of ozone episodes, particularly in summertime, and the recent publication on research into the effect on public mortality in the wintertime smog episode of December 1991 in central London have again raised public concern about air quality.

Maps 14 to 18 show five of the pollutants listed in Table 8 and the distribution of concentrations throughout the plan area. The higher levels for most of the pollutants are recorded around the urban areas and major roads, for example, the A523 and A50 can be seen on the CO and NO_x maps. The National Environmental Technology Centre (NETCEN) has provided the data used for all of the Air Emissions maps. It is based on a number of monitoring stations within the plan area and then parts have been modelled to fill in any gaps. For any detailed analysis or interpretation always refer to the Regional Air Quality maps.



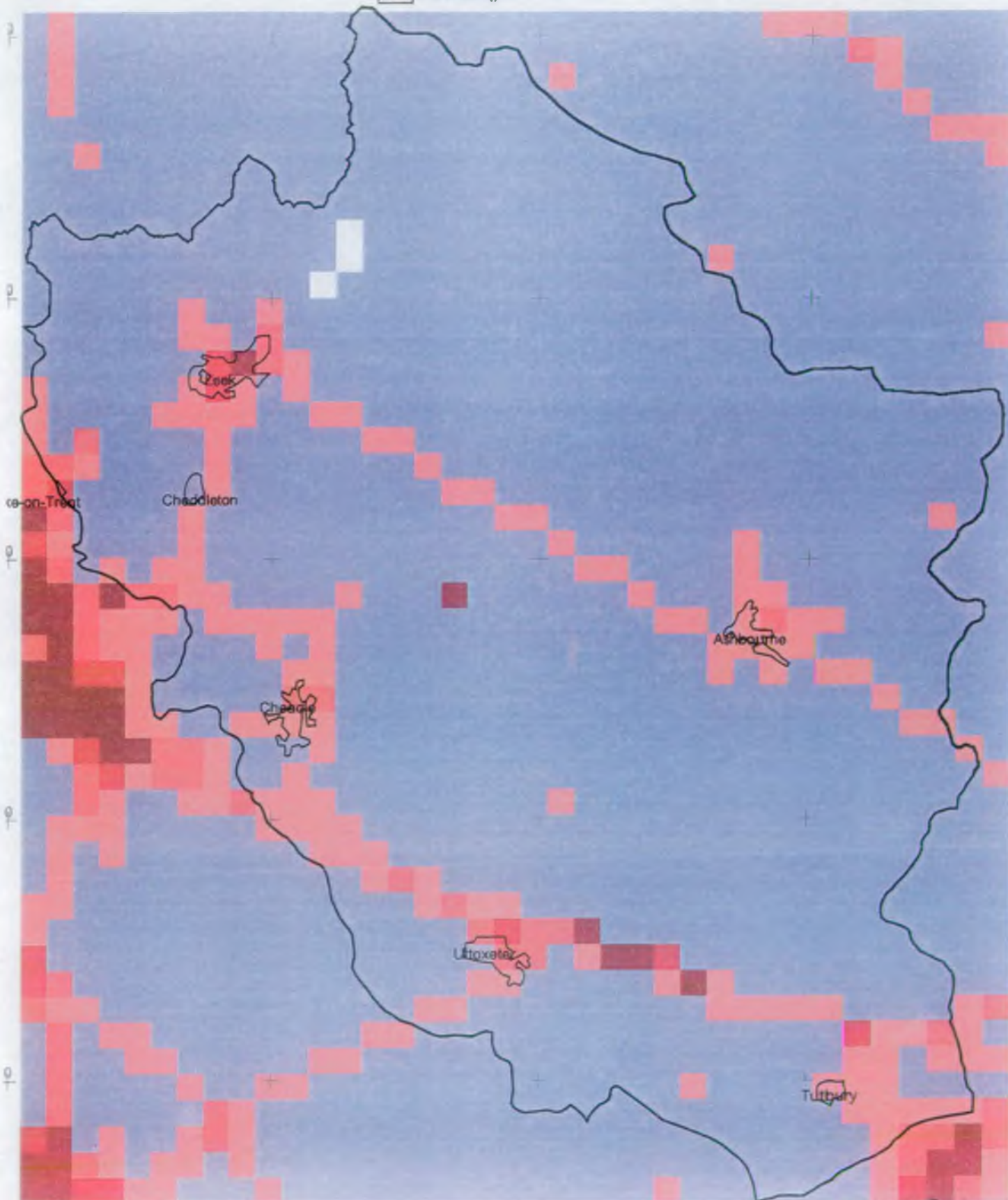
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Summary Statistics:

Min: 0.0000
 Max: 321.5045
 Mean: 11.3585
 SD: 29.1606



Stafford

0

5

10

15 Kilometers

Burton upon Trent

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cal Environment Agency Plan
p 15 : Air Quality Emissions



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- Dove Boundary
- Urban Areas
- Urban
- SO₂ Total (tonnes / 1x1km)**
- 1 - 0 S.D. (-50.974 - 2.84)
- Mean (2.84)
- 0 - 1 S.D. (2.84 - 56.655)
- 1 - 2 S.D. (56.655 - 110.47)
- 2 - 3 S.D. (110.47 - 164.284)
- > 3 S.D. (164.284 - 2205.526)
- No Data ()

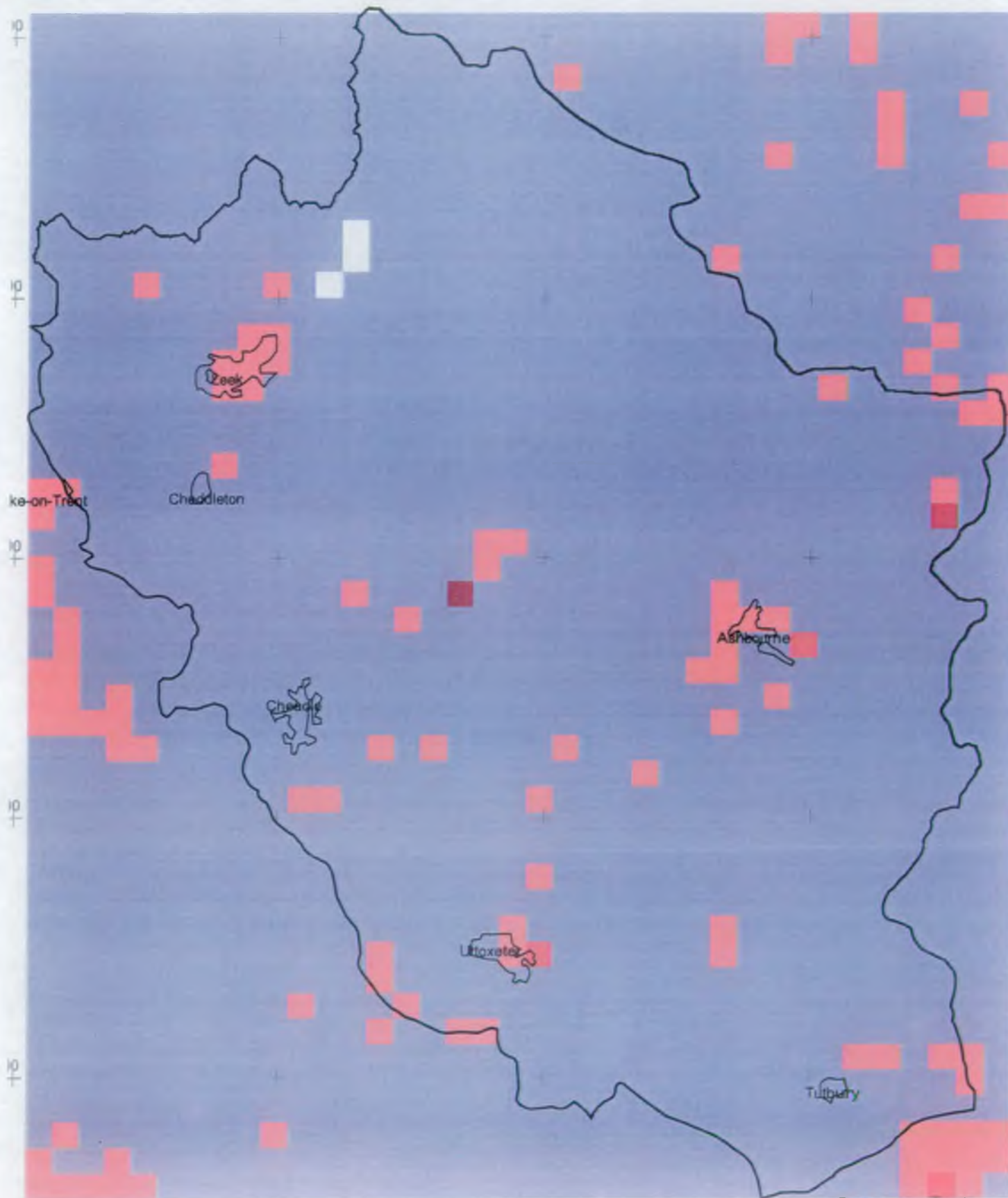
Summary Statistics:

Min: 0.0000

Max: 2205.5259

Mean: 2.8403

SD: 53.8147



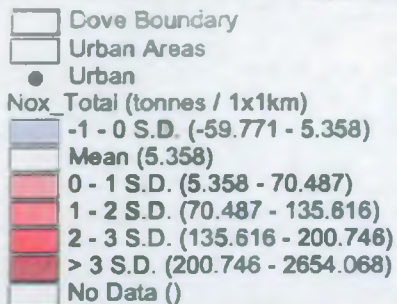
Burton upon Trent

Fri May 28 10:57:47 1999



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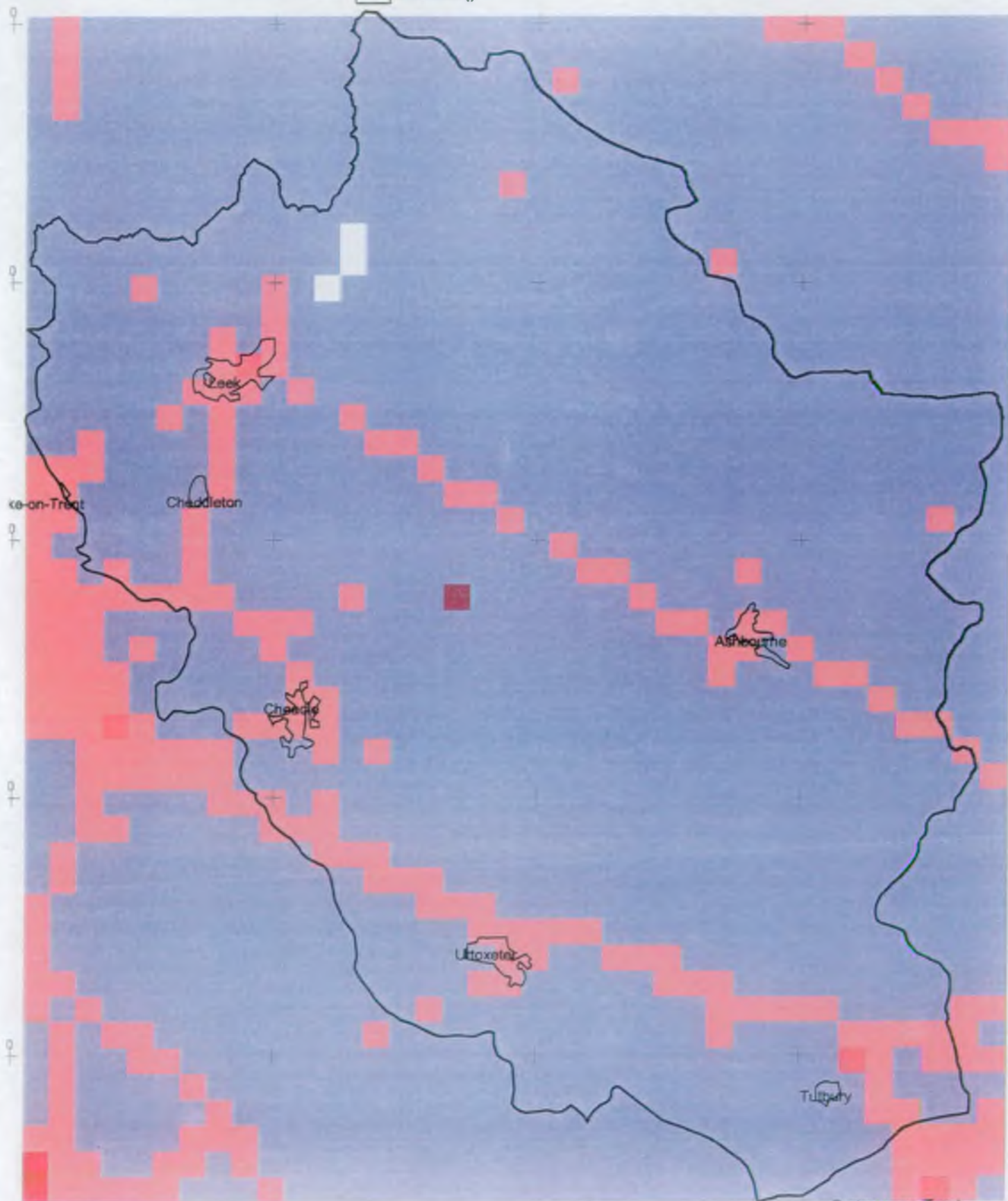
Summary Statistics:

Min: 0.0000

Max: 2654.0681

Mean: 5.3580

SD: 65.1292



Stafford 0 5 10 15 Kilometers

Fri May 28 10:57:41 1999



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- Dove Boundary
- Urban Areas
- Urban
- VOC_Total (tonnes / 1x1km)
- 1 - 0 S.D. (-7.425 - 4.747)
- 0 - 1 S.D. (4.747 - 16.92)
- 1 - 2 S.D. (16.92 - 29.092)
- 2 - 3 S.D. (29.092 - 41.264)
- > 3 S.D. (41.264 - 140.406)
- No Data ()

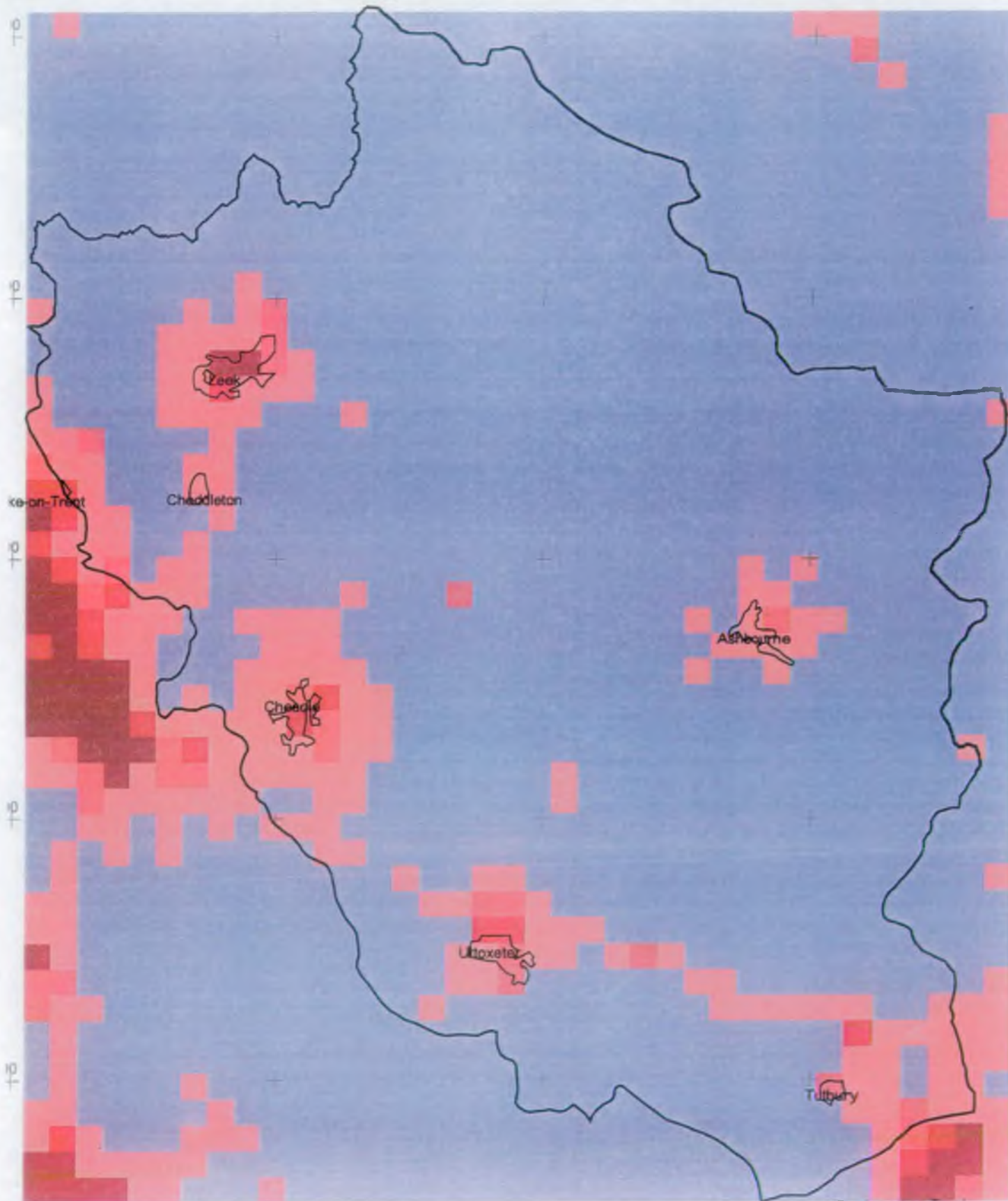
Summary Statistics:

Min: 0.0629

Max: 140.4056

Mean: 4.7471

SD: 12.1724



Stafford

0

5

10

15 Kilometers

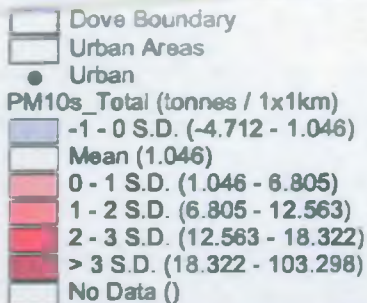
Burton upon Trent

Fri May 28 10:57:50 1999



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Summary Statistics:

Min: 0.0000

Max: 103.2978

Mean: 1.0463

SD: 5.7586

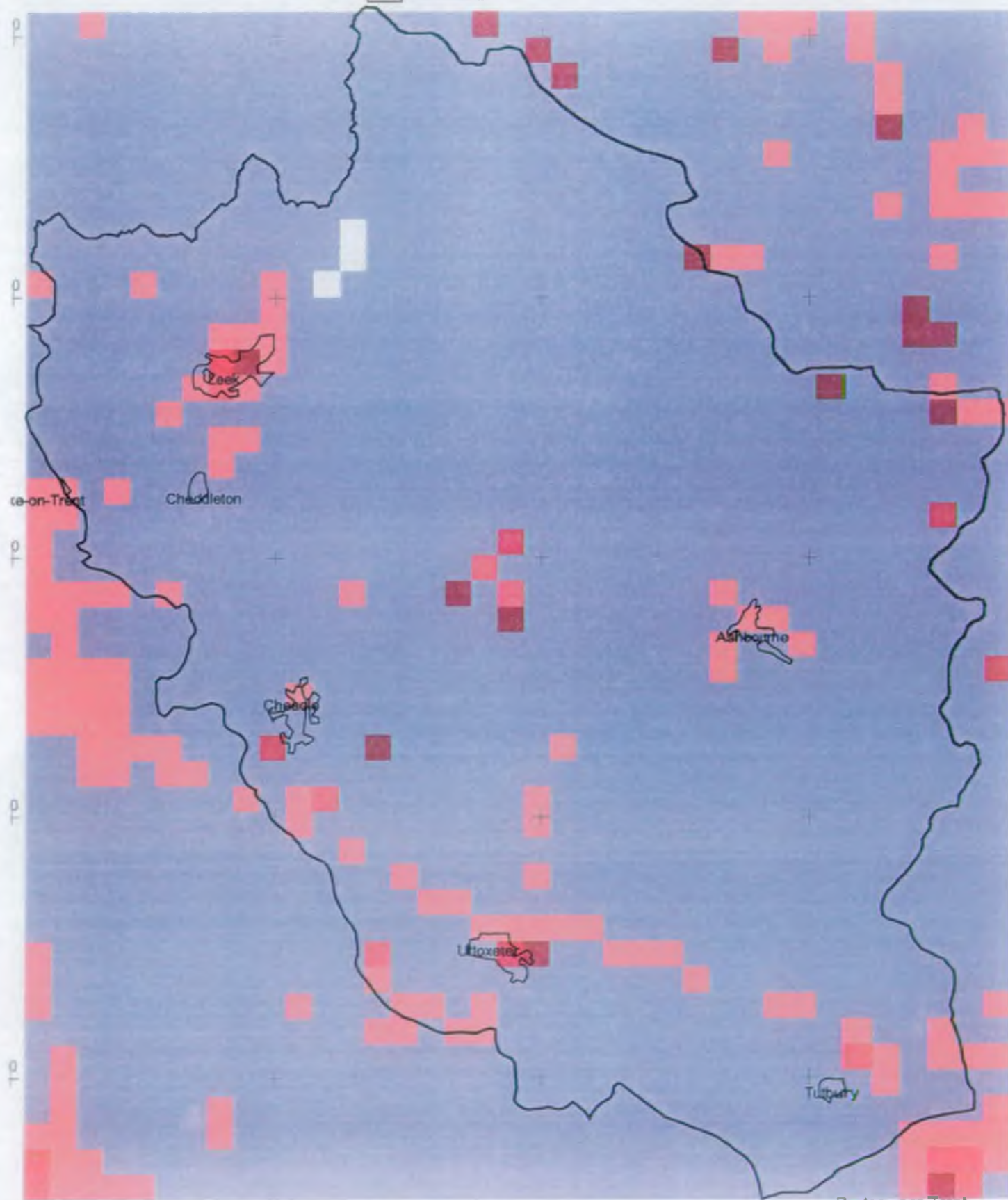


Table 8 - Summary of the revised limits and objectives proposed by the government in its latest review of the National Air Quality Strategy

	ATIONAL AIR QUALITY STRATEGY			EU AIR QUALITY DIRECTIVES	OUTCOME OF JANUARY 1999 STRATEGY REVIEW
Pollutant	Existing UK standard		Objective to be achieved by 2005	Provisional limit values	Proposals for amendments to the NAQS objectives (provisional targets in italics)
	concentration	measured as			
Benzene	5ppb (16µg/m³)	Running annual mean	5ppb (16µg/m³)	0.5µg/m³ (1.66ppb) by 2010	5ppb (16.2µg/m³) mean by 31 Dec 2003; <i>provisional objective 1ppb (3.2µg/m³) by 31 Dec 2005</i>
1, 3-Butadiene	1ppb (3µg/m³)	Running annual mean	1ppb (3µg/m³)		1ppb (3.2µg/m³) by 31 Dec 2003
CO	10ppm (12mg/m³)	Running 8-hour mean	10ppm(2mg/m³)	10mg/m³ (8.5ppm) by 2005	10ppm (11.65mg/m³) by 31 Dec 2003
Lead	0.5µg/m³	Annual mean	0.5µg/m³	0.5µg/m³ annual mean, by 1 Jan 2005, or within 1000m of specific industrial sources, by 1 Jan 2010	0.5µg/m³ by 31 Dec 2004 0.25µg/m³ by 31 Dec 2008
Nitrogen Dioxide	150ppb (286µg/m³)	1 hour mean	150ppb (286µg/m³), hourly mean (provis onal)	104.6ppb (200µg/m³) hourly mean, not to be exceeded more than 18 times a year, by 1 Jan 2010	104.6ppb (200µg/m³) by 31 Dec 2005 (maximum of 18 exceedences)
	21ppb (40µg/m³)	Annual mean	21ppb (40µg/m³), annual mean (provisional)	21ppb (40µg/m³) annual mean, by 1 Jan 2010	21ppb (40µg/m³) retained as provisional objective for 31 Dec 2005. <i>New annual objective 15.7ppb (30µg/m³) for 31 Dec 2000</i>
Ozone	50ppb (100µg/m³)	Running 8-hour mean	50ppb/m³, measured as the 97 th percentile (10 exceeds a year) (provisional)		50ppb (100µg/m³) retained as provisional objective for 31 Dec 2005
Particles (PM ₁₀)	50µg/m³	Running mean 24-hour	50µg/m³, measured as the 99 th of daily maximum running 24 hour mean (equivalent to 4 exceedences per year) (provisional)	50µg/m³ 24-hour limit value, not to be exceeded more than 35 times a year, and 40µg/m³ annual limit, by 1 Jan 2005. Indicative stage 2: 50µg/m³ 24 hour limit value, not to be exceeded more than 7 times a year, and 20µg/m³ annual limit value, to be achieved by 1 Jan 2010	New annual objective of 40µg/m³ New 24 hour objective of 50µg/m³ (maximum 35 exceedences) for 31 Dec 2004 50µg/m³ and 4 exceedences by 31 Dec 2005 retained as provisional objective. New provisional annual objective of 20µg/m³ by 31 Dec 2009 New provisional 24 hour level of 50µg/m³ (7 exceedences) by 31 Jan 2009
Sulphur dioxide	100ppb (267µg/m³)	15 minute mean	100ppb (267µg/m³), measured as the 99.9 th percentile (equivalent to exceedences of 35 periods of 15 minutes per year) (provisional)	131ppb (350µg/m³) 1 hour limit value, not to be exceeded more than 24 times a year, and a 24 hour limit value of 48.6ppb (125µg/m³), not to be exceeded more than 3 times a year, to be achieved by 1 Jan 2005	100ppb (267µg/m³) as 99 th percentile of 15 minute means adopted as firm objective for 31 Dec 2005 New 1 hour objective of 131ppb (350µg/m³), max 24 exceedences a year (2004) New 24 hour objective of 46.8ppb (125µg/m³), max 3 exceedences a year, for 31 Dec 2004 New national annual and winter objectives of 7ppb (20µg/m³) for 31 Dec 2000

2.3.2 Process Industries Regulation (PIR)

2.3.2.1 Integrated Pollution Control

The Environmental Protection Act 1990 as amended by the Environment Act 1995 introduced the systems of IPC and Local Authority Air Pollution Control (LAAPC). IPC is concerned with the prevention and control of emissions to all three media of the environment: air, land and water. The industrial processes regulated under this system are Part A prescribed processes, defined in regulations made under EPA 90 and they are the most technically complex and potentially most polluting industrial processes:

- Fuel production, combustion and associated processes
- Metal production and processing
- Mineral industries
- Chemical industry
- Waste disposal and recycling
- Other industries e.g. paper making

Operation of a prescribed process requires authorisation and the Agency is responsible for implementing IPC and regulating the most complex industrial processes. Less polluting processes (Part B processes) are authorised and regulated by the Environmental Health departments of local authorities under LAAPC.

The IPC system requires that prescribed processes should use the principle of best available techniques not entailing excessive cost (BATNEEC) to prevent or minimise polluting substance releases and render all substances harmless. Regulators and operators should also have regard to the best practicable environmental option (BPEO) for the releases. The principles of BATNEEC and BPEO ensure that the needs of industrial processes are appropriately balanced with the costs and benefits of environmental protection.

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

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

- Release limits
- Reporting requirements
- Operating conditions
- Improvement programmes

Non-compliance with the conditions of an authorisation can result in enforcement action.

The following table summarises the IPC authorised sites in the Dove catchment.

Table 9 – IPC sites in the Dove catchment

Operator Name	Industry Sector Name
A P Chemicals Ltd, Cheddleton, Leek	Organic Chemical Industry
Acordis Acetate Chemicals Ltd, Leek	Organic Chemical Industry
Esterchem Ltd, Leek	Organic Chemical Industry
Nestle (UK) Ltd, Tutbury	Fuel and Power associated
Blue Circle Industries Ltd, Cauldon	Cement Industry
Croda Universal Ltd, Leek	Chemical Industry
Thomas Bolton Ltd, Cheadle	Non Ferrous Metals Industry

Details of IPC authorisations are held on the public register at the Agency's area office at Fradley Park, Lichfield and on public registers held by local authorities.

In the document 'An Environmental Strategy for the Millennium and Beyond' the Agency has a commitment to address climate change and improve air quality. This includes reduction target for CO₂, SO₂, NO_x, PM₁₀, CO, dioxins, lead, non-ferrous metals, VOCs (excluding methane), ozone-depleting substances and other greenhouse gases. These emission reduction targets relate only to the processes under the Agency's control and are subject to BATNEEC and BPEO.

Emissions data is collected by the Agency and published through the Pollution Inventory which may be accessed via the Agency's website (www.environment-agency.gov.uk). This database is being further developed to enable monitoring of reduction targets. The routine monitoring carried out by the Agency supports, and checks, the monitoring which is carried out by the operator as a requirement of their authorisations.

2.3.2.2 Bovine Spongiform Encephalopathy – (BSE)

The Agency has supplied evidence to the BSE Inquiry on the risks to human health through the environment from the disposal of materials from the BSE crisis. The evidence describes how the Agency has evaluated the position using quantitative risk assessment along lines well established in the nuclear and chemical industries and employing advice from the Government's Spongiform Encephalopathy Advisory Committee (SEAC) on biological issues.

The assessment concluded that there is little significant risk from BSE materials in rendering, incineration or, if proposed, burning in power stations. In contrast, further work would be needed to determine the acceptability of landfilling if disposal by this route was contemplated. Beyond risk assessment, the evidence outlines particular aspects of the Agency's day-to-day involvement with BSE operations such as rendering at John Pointon & sons Ltd, Cheddleton. It covers the Agency's liaison with other organisations and its efforts to keep the public fully informed.

The evidence points out that whilst the Agency is centrally involved in assessing, monitoring and preventing risks to health through environmental routes, the lead in dealing with BSE and nv-CJD lies with other departments and agencies. The Agency is not the Health Authority, nor has it a role in arranging the disposal of BSE materials.

2.3.2.3 Genetically modified organisms (GMOs)

The Environment Agency holds public information on releases of GMOs on behalf of the Department of Environment, Transport and the Regions. Control is effected through the Environment Act 1995 and the Genetically Modified Organisms Regulations. The Advisory Committee on Releases to the Environment (ACRE) ensure that the release of GMOs does not cause additional risk to the safety of the animal and human health, and the wider environment.

The holder of a consent to release GMOs has to advertise locally and notify the relevant authorities. Details of consents are available on our public register at Olton Court, Solihull.

2.3.3 Radioactive Substances Regulation

The Environment Agency is responsible for regulating the storage, use and disposal of radioactive materials through the Radioactive Substances Act 1993 (RSA 93), as amended by the Environment Act 1995. Other legislation concerning radioactivity is regulated through the Health and Safety Executive (HSE), with whom the Agency maintains close liaison. There are three principles of radiological protection: justification, optimisation and limitation.

There are two main types of certificate granted in relation to RSA93. **Registrations** are issued which regulate the storage and use of radioactive materials (including mobile sources). These tend to be associated with smaller users and are less environmentally significant since the radioactive substances are usually in sealed instruments. **Authorisations** are issued which regulate the accumulation and disposal of radioactive wastes and are usually associated with larger uses, e.g. hospitals, universities and research facilities.

There are no RSA 93 authorisations in the Dove catchment, however, there are nine sites in the plan area which have RSA Registrations. These are:

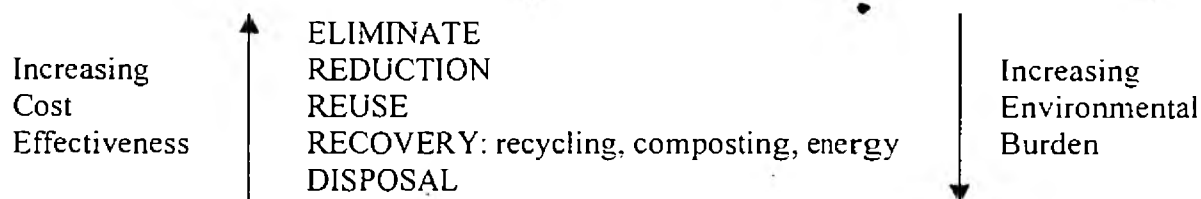
Nestle Co. Ltd, Tutbury
Windmill Extrusions Ltd, Ashbourne
Courtaulds Ltd, Leek
Croxden Gravel Ltd, Cheadle
Joshua Wardle Ltd, Leekbrook
Blue Circle Industries, Caudon
M and V Vehicle Repairs Ltd, Leek
Nestle UK Ltd, Ashbourne

2.3.4 Waste Management and Regulation

The Government White Paper, Making Waste Work (DoE, 1995) sets out the Government's policy framework for sustainable waste management in England and Wales. The strategy is based on three key objectives:

- To reduce the amount of waste that society produces
- To make best use of the waste produced
- To minimise risks of harm to health and environmental pollution

The principles of Best Practicable Environmental Option (BPEO) and Life Cycle Analysis (LCA) should be used for assessing options and a Waste Hierarchy is indicated:



The overall policy and aims of the strategy are to increase the proportion of waste managed by the options towards the top of the waste hierarchy. There is currently some debate about the validity of the hierarchy for all wastes and the Agency is undertaking research in this respect concerning LCA for different waste types at local levels although elimination and reduction of wastes will always be the preferred option. The Government introduced the Landfill Tax in October 1996 to provide a financial incentive to encourage the move up the waste hierarchy and away from landfill disposal and the effects of this are not yet clear. Where it is impossible to eliminate waste it is acknowledged that there will still be occasions where disposal is the only or most sustainable option.

Making Waste Work identifies specific primary targets:

- To reduce the proportion of controlled waste going to landfill to 60% by 2005;
- To recover 40% of municipal waste (including all household waste and some commercial waste collected by local authorities) by the year 2005 – this includes recycling, composting and energy from waste.

The strategy identified other, secondary, targets including:

- To recycle or compost 25% of household waste by the year 2000;
- To increase the use of secondary and recycled materials as aggregates in England from 30 million tonnes p.a. to 55 million tonnes p.a.;
- To increase home composting activity to 40% of households with a garden by 2000;
- One million tonnes of organic household waste to be composted by the year 2000;
- Easily accessible recycling facilities for 80% of households by the year 2000.

In the past, waste Regulation Authorities have produced Waste Management Plans which consider all technical issues relating to waste management and conclude by establishing strategy objectives. The plans were a statutory requirement of Section 50 of the Environmental Protection Act 1990 but this requirement was repealed by the Environment Act 1995. Waste Management Plans whether in draft form or having been finalised provide a useful source of information. However, whilst the location of waste management sites can be determined to fall either within or outside a catchment area, the waste arisings statistics contained in the plans are detailed on a district or county basis, they are therefore not able to provide meaningful information in relation to a catchment area.

National Waste Production Survey

The Environment Act 1995 placed a duty on the Secretary of State to prepare a National Waste Strategy. In order to help plan the provision of waste disposal recycling and reprocessing facilities in the future and to provide the baseline information for the government's emerging National Waste Strategy, the government asked the Environment Agency to carry out a survey to determine how much waste is produced by industry and commerce throughout the country and how the waste is managed.

The survey was completed during the period October 1998 to March 1999 and involved the Agency or agents acting on behalf of the Agency contacting in excess of 20,000 companies (approximately 200 located within the catchment), representing some 3% of all businesses. Once collated the Agency will be able to produce data for business sectors from which national, regional and local waste production totals can be estimated.

2.3.5 European Water Quality Directives

A number of EC Directives contain standards which have implications for water quality in the Dove catchment and the Agency has specific responsibilities to ensure that the Directives are implemented appropriately.

2.3.5.1 Surface Water Abstraction Directive (75/440/EEC)

The EC Directive concerning the quality required of surface water intended for the abstraction of drinking water protects the quality of surface water used for public water supply.

There are 2 surface water abstraction sites in the Dove LEAP area, both at Tittesworth Reservoir. There were no EC-Directive failures in 1997 for these sampling points.

2.3.5.2 Freshwater Fisheries Directive (78/659/EEC)

The EC Directive on the quality of waters needing protection or improvement in order to support fish life ensures that water quality in designated stretches of water is suitable for supporting certain types of fish. There are two sets of water quality standards in the Directive, one set for cyprinid and a more stringent set for salmonid.

During 1997 the ammonia standard (0.78mg/l), laid down in this Directive, was exceeded on Bentley Brook at Mayfield, which is designated as a cyprinid fishery. The high concentration of ammonia in the brook coincided with elevated ammonia levels at Ashbourne Sewage Treatment works. The problems at the works are being addressed under AMP3.

2.3.5.3 Dangerous Substances Directive (76/464/EEC)

The EC Directive on pollution caused by certain substances discharged in the aquatic environment of the community protects the water environment by controlling the discharges to rivers, estuaries and coastal waters. There are two lists of compounds. List I contains substances regarded as particularly dangerous because they are toxic, they persist in the environment and they bioaccumulate.

List II substances which are considered to be less dangerous but which still can have a harmful effect on the water environment. Both are measured against respective Environmental Quality Standards (EQSs)

There are 16 List I sampling points in the Leap area and 9 List 2 sampling points. There were no failures in 1997 for either List I or List 2.

2.3.5.4 Urban Waste Water Treatment Directive (91/271/EEC)

The EC Directive concerning urban wastewater specifies certain treatment standards for sewage treatment and sewage collection systems, in addition to encouraging reuse of water. The level of treatment is dependent upon the type and sensitivity of the receiving water and discharge size, expressed as Population Equivalents (PE). This Directive specifies that secondary treatment is the norm and must be provided for all discharges serving PEs greater than 2,000 to inland waters and estuaries, and greater than 10,000 to coastal waters. Discharges below these levels should receive appropriate treatment as defined in Government guidance. We are responsible for making sure that discharges receive the appropriate level of treatment specified in this Directive.

The Directive also requires more stringent treatment for discharges to Sensitive Areas, and/or less stringent treatment to Less Sensitive or High Natural Dispersion Areas (HNDAs) for estuarine and coastal waters providing that the schemes can be justified. Sensitive Areas are areas, which are, or may become eutrophic if protective action is not taken. They apply to freshwaters and estuarine waters that receive discharges from works serving Population Equivalents of greater than 10,000.

The DETR decide if a watercourse should be identified as being a Sensitive Area. The Environment Agency carries out monitoring and provide information to DETR as well as ensuring that qualifying discharges to Sensitive Areas receive a higher level of treatment for Total Phosphorous and/or Total Nitrogen removal if justified.

Less Sensitive Areas or HNDAs apply to those estuarine or coastal waters which have been identified by the DETR as areas having high natural dispersion characters. In these areas a less stringent level of sewage treatment may be permitted subject to the satisfactory outcome of comprehensive studies. These studies are carried out by the discharge source with the work being audited by the Agency and must demonstrate that the discharge will not adversely affect the environment. We are responsible for ensuring that these studies are carried out correctly in accordance with nationally agreed standard methodology.

Staunton Harold Reservoir has been investigated as a Sensitive Area for the 1997 submissions under the UWWTD. This designation relates to water abstracted from the River Dove, where the abstraction point is at Egginton near the A38 crossing of the Dove. The Dove shows no signs of eutrophication with problems only perceived when the water is within the reservoir. Problems are exacerbated during the summer when the reservoir levels are low. It was not proposed as a sensitive area because of the limited scale of the problem and the cost associated with removal of phosphate at the four major works inputs on the Dove. There are no further designations proposed within the plan area.

2.3.5.5 Nitrates Directive (92/676/EEC)

This EC Directive concerns the protection of waters against pollution caused by nitrates from agricultural sources along with placing restrictions on fertiliser use. The Directive requires Member States to monitor the nitrate concentration in freshwaters (surface and ground) and review the eutrophic state of fresh surface, estuarine and coastal waters to identify those that are or could be affected by nitrate from diffuse agricultural sources. The land draining to these polluted waters should be designated as a Nitrate Vulnerable Zone (NVZ). In England, Action Plans have been established within NVZs to reduce existing nitrate pollution and prevent further pollution. Outside NVZs, Member States should establish and promote a code of good agricultural practice. Reviews of existing and potential new NVZs are carried out every four years.

The Agency is responsible for advising on the selection of potential NVZs and defining their boundaries. The designation of NVZs and agricultural measures to be adopted is the responsibility of the Government.

There are no surface or groundwater NVZs in the Dove catchment.

2.3.5.6 Groundwater Directive (80/68/EEC)

The EC Groundwater Directive controls the release of certain substances to groundwater. As such they are intended to prevent the introduction of List I substances, into groundwater and prevent pollution of groundwater by List II substances, by controlling activities which may lead to their direct or indirect discharges into groundwater. The Groundwater Directive has been fully implemented via Regulation 15 of the Waste Management Licensing Regulations 1994, the Groundwater Regulations 1998 (see section 2.3.6.3), existing controls under Part I of the Environmental Protection Act 1990, and Part II of the Water Resources Act 1991.

There are no statutory standards for the quality of groundwater, and because of the difficulties in obtaining and interpreting information we have only limited data on the impacts of human activity on groundwater quality.

2.3.5.7 Integrated Pollution Prevention and Control (IPPC)

The Integrated Pollution Prevention and Control Directive is designed to prevent, reduce and eliminate pollution at source through the prudent use of natural resources. In addition to covering emissions to air, land and water as well as heat, the IPPC Directive also helps industrial workers achieve greater environmental sustainability by incorporating greater emphasis upon noise and vibration, energy and efficiency, environmental accidents and site protection. The IPPC Directive will also look more closely at many more types of industrial processes, taking into consideration the wider implications of pollution produced by a plant (or activity) and starts with the best environmental way of doing the job.

To help achieve the highest level of protection for the environment as a whole the IPPC will use a system of permits which will specify plant operating conditions, emission limits for certain substances to air, land and water, and the requirement for annual reporting of pollutant releases. IPPC permits will be required for all new and substantially changed installations. We expect that existing IPC authorisations will be gradually replaced with permits under IPPC in the period up to October 2007.

The Government intends to bring in the necessary legislation by end October 1999, including supporting regulations. The Agency and local authorities will be heavily involved enforcing the Directive in England and Wales. The Agency will strive to make regulation and enforcement proportionate to the environmental risk involved, to ensure that regulation and enforcement is practical and efficient in its implementation while protecting and improving the environment as a whole.

The Agency is responsible for the monitoring of controlled waters for compliance with all the above directives. Where the requirements of the Directives are not met, the Agency is responsible for identifying sources of pollution and making sure that improvements are made.

2.3.6 UK water quality objectives

2.3.6.1 Surface water

The Environment Agency and predecessor bodies set strategic targets called River Quality Objectives (RQOs) for rivers and canals. RQOs provide a basis for water quality management decisions and are based on a chemical classification scheme called "The River Ecosystem Classification scheme". The Scheme comprises five quality classes, RE1 to RE5, which reflect the chemical quality required to support different types of river ecosystems and are shown in table 10 below.

Table 10 – Rivers Ecosystem Classification

Class RE1	Water of very good quality for all fish species
Class RE2	Water of good quality suitable for all fish species
Class RE3	Water of fair quality suitable for high class coarse fish populations
Class RE4	Water of fair quality suitable for coarse fish populations.
Class RE5	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, or insufficient data available by which to classify water quality.

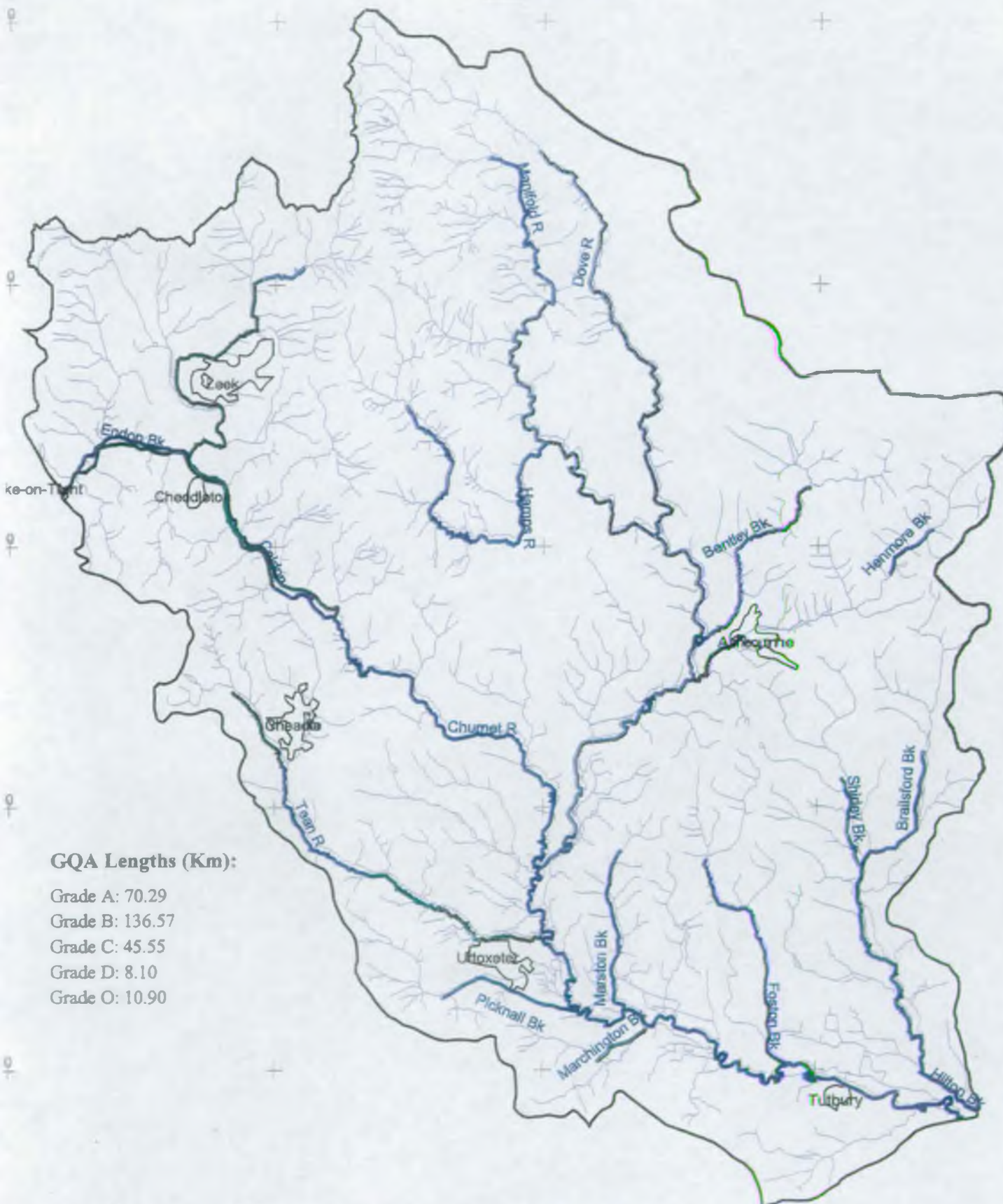
(Source: The Surface Waters (River Ecosystem Classifications) Regulations, 1994).

Periodic assessment is now made by applying the General Quality Assessment (GQA) Scheme of which there are four aspects: Chemistry, Biology, Nutrient and Aesthetics. Each aspect is based upon six water quality grades. See table 11.



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








- Dove Boundary
- Water Quality: GQA Chemistry ('93-'95)
- Grade A - Good
- Grade B - Good
- Grade C - Fair
- Grade D - Fair
- Grade E - Poor
- Grade F - Bad
- Minor Rivers
- Urban Areas

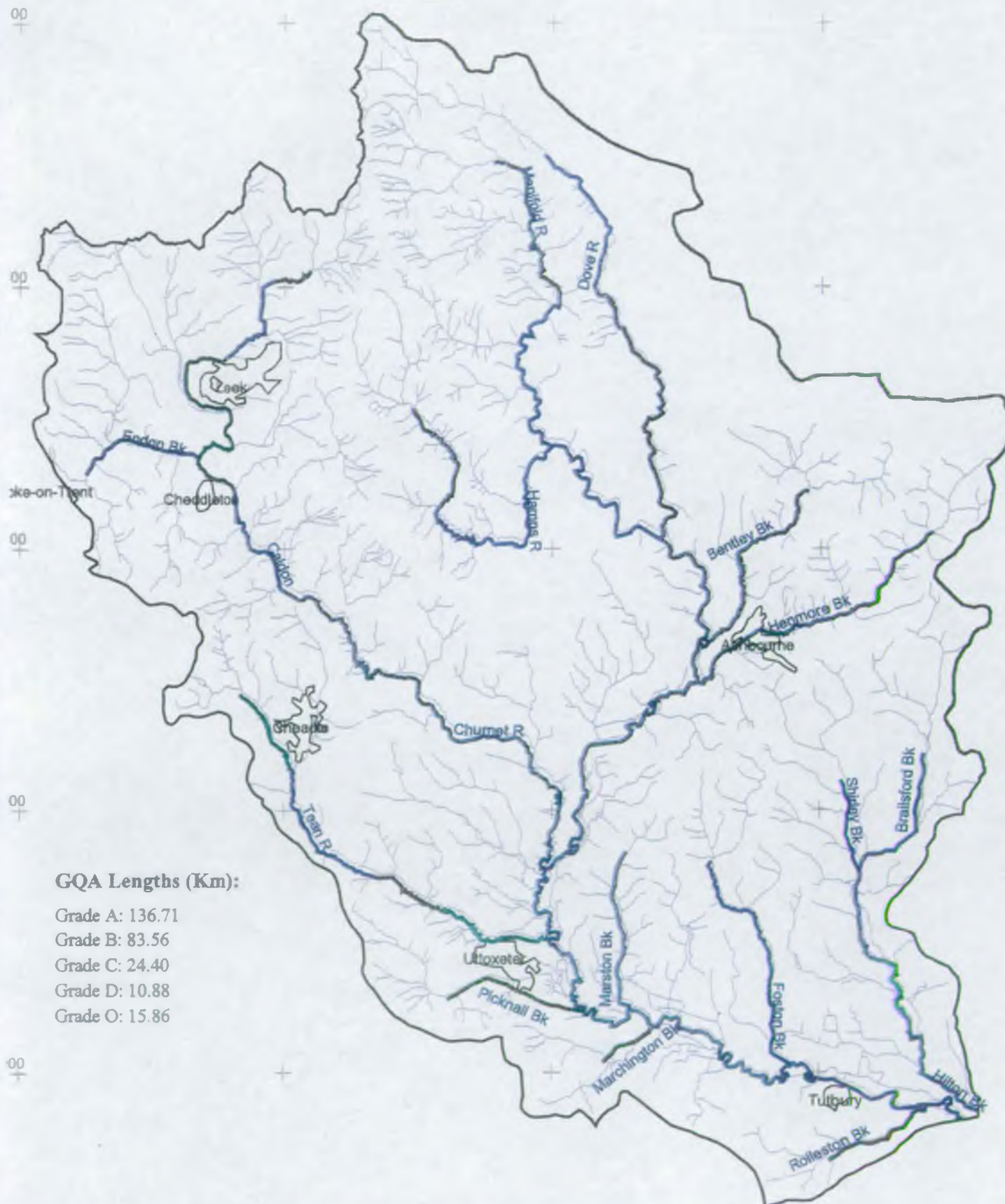


GQA Lengths (Km):

Grade A: 70.29
 Grade B: 136.57
 Grade C: 45.55
 Grade D: 8.10
 Grade O: 10.90



-  Dove Boundary
- Water Quality: GQA Biology ('93-'95)**
-  Grade A - Very Good
-  Grade B - Good
-  Grade C - Fairly Good
-  Grade D - Fair
-  Grade E - Poor
-  Grade F - Bad
-  Minor Rivers
-  Urban Areas



GQA Lengths (Km):

Grade A: 136.71
Grade B: 83.56
Grade C: 24.40
Grade D: 10.88
Grade O: 15.86

0

5

10

15 Kilometers

Table 11 – GQA Scheme classes

Class A	Water of very good quality
Class B	Water of good quality
Class C	Water of fairly good quality (suitable for high class coarse fish populations)
Class D	Water of fair quality (suitable for coarse fish populations)
Class E	Water of poor quality
Class F	Water of bad quality

The current chemical and biological quality of the Dove catchment under the GQA scheme is summarised in table 12 and shown in maps 19 and 20.

Table 12 – Length of river in grade (km) 1997 data

Quality	Grade	Chemistry	Biology
Good	A	97.7	121.9
	B	128.2	8.3
Fair	C	38.3	4.2
	D	6.3	12.8
Poor	E	0	10.8
Bad	F	0	0

Table 13 summarises the water quality of each river stretch of the Dove catchment during 1997.

Table 13 – Summary of compliance with the river water quality objectives of each river stretch in the Dove catchment for 1997.

River	Stretch description	River Quality Objective			Comments
		Current Quality 1997	Short Term Objective	Long Term RQO	
River Dove	Crowdecote Rd Br to Hartington	RE2	*	RE1	Marginal failure on BOD
River Dove	Hartington to R Churnet	RE1	*	RE1	C
River Dove	R Churnet to R Tean	RE2	*	RE2	C
River Dove	R Tean to Foston Bk	RE2	*	RE2	C
River Dove	Foston Bk to R Trent	RE2	*	RE2	C
Manifold R	Longnor to Hulme End	RE2	RE2(95)?	RE1	Significant failure on BOD
Manifold R	Hulme End to R Hamps	RE2	*	RE1	Significant failure on BOD
Manifold R	R Hamps to R Dove	RE1	*	RE1	C
Hamps R	B5053 Rd Br Onecote to Winkhill	RE2	RE2(95)	RE1	Significant failure BOD
Hamps R	Winkhill to conf Manifold	RE2	RE2(95)	RE1	Marginal failure on BOD
Bentley Bk	Conf Haven Dale Bk to Ashbourne	RE1	*	RE2	C
Bentley Bk At Mayfield	Ashbourne STW to Conf with R Dove	RE4	*	RE3	Marginal failure on Ammonia
Henmore Bk At Atlow	Carsington Reservoir to Atlow	RE3	*	RE2	Marginal failure BOD
Henmore Bk	Atlow to Ashbourne School Lane	RE3	*	RE2	Marginal failure on BOD
Henmore Bk	Ashbourne School Lane to R Dove	RE3	*	RE3	C

Churnet Bk	A 53 Upper Hulme to Tittesworth Res	RE1	*	RE1	C
Churnet Bk	Tittesworth Res to Tittesworth Flume	RE4	*	RE1	Significant failure on Ammonia and BOD
Churnet Bk	Tittesworth Res Flume to Abbey Green Br	RE2	*	RE2	C
Churnet Bk	Abbey Green Road Br to Bridgend	RE2	RE3(95)	RE2	C
Churnet Bk	Bridgend to Leek Stw Outfall	RE3	*	RE2	Marginal failure on BOD
Churnet Bk	Leek STW Outfall to Conf. With Endon Bk	RE3	RE5(95)	RE3	C
Churnet Bk	Endon Bk to Cheddleton Station	RE3	RE4(95)	RE3	C
Churnet Bk	Cheddleton Station to Consall	RE2	*	RE3	C
Caldon Canal	Bank End Cheddleton Station to Froghall Warf	RE2	RE3(97)	RE3	C
Churnet Bk	Consall to Conf with R Dove	RE2	*	RE2	C
Endon Bk	Flood Wall 40 M Culvert to R Churnet	RE3	RE4(95)	RE2	Marginal failure on DO
Teaen R	FB Below Godley Bk to Trib at Mobberley	RE3	RE3(95)	RE2	Significant failure on BOD, Ammonia
Teaen R	Conf. Trib Mobberly to Upper Teaen	RE2	*	RE2	C
Teaen R	Upper Teaen to Checkley STW Outfall	RE4	*	RE2	Significant failure on BOD, DO

Teaen R	Checkley STW Outfall to FB at Beamhurst	RE3	RE5(95)	RE4	C
Teaen R	FB at Beamhurst to conf. R Dove	RE3	*	RE3	C
Picknall Bk	Loxley Ln Br to Conf with R Dove	RE2	*	RE2	C
Marston Bk	Marston Monty Rd Br to R Dove	RE2	*	RE2	C
Marchington Bk	Conf. DS Stock LN to R Dove	RE2	*	RE3	C
Foston Bk	Conf. With Bentley Bk to R Dove	RE2	*	RE2	C
Rolleston Bk	Conf Bushton Bridge to Rolleston Stw	RE3	*	RE2	Marginal failure on BOD, DO
Brailsford Bk	A52 rd BR Brailsford to Conf Shirley Bk	RE1	*	RE2	C
Shirley Bk	Mill Lane BR Shirley to Sutton Bk	RE1	*	RE2	C
Rolleston Bk	Rolleston Stw to Tutbury Mill Fleam	RE3	*	RE2	Marginal failure on DO
Hilton Bk	Brailsford Bk to Longford Mill Outlet	RE1	*	RE2	C
Hilton Bk	Longford Mill Outlet to R Dove	RE1	*	RE2	C

* Stretches where the short term objective is the same as the long term objective

C = Compliant with objective

2.3.6.2 Groundwater protection.

The protection of the groundwater is of great importance since once contaminated, aquifers are extremely difficult and expensive to clean-up. The vulnerability of groundwater is prioritised by the Agency in terms of Source Protection Zone I (Inner Source Protection), Zone II (Outer Source Protection), Zone III (Source Catchment), resource protection based upon aquifer type (Major Aquifer, Minor Aquifer, Non-Aquifer), and soil leachability (High, Moderate and Low Leachability).

The Agency advises on groundwater protection through the document, 'The Policy and Practice for the Protection of Groundwater'. Whilst there is no statutory basis for this document at present, the EC Groundwater Directive has now been fully implemented via Regulation 15 of the Waste Management Licensing Regulations 1994, the Groundwater Regulations 1998, existing controls under Part I of the Environmental Protection Act 1990, and Part II of the Water Resources Act 1991.

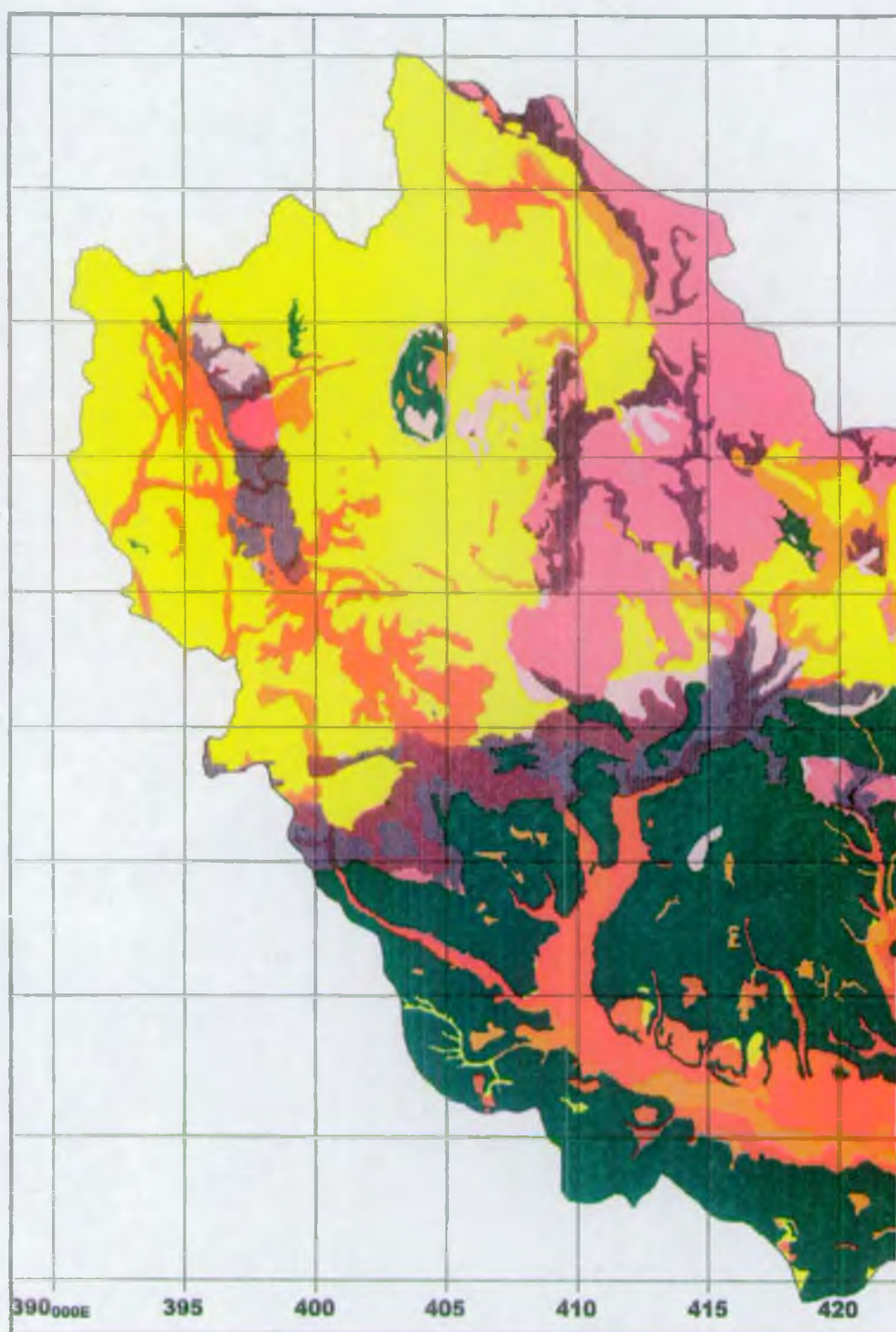
Our policies are supported by Groundwater Vulnerability Maps (Map 21), which have been published for England and Wales. These vulnerability maps are presently utilised with published geological maps, draft source protection zone maps, and details of groundwater depth to help us advise planners and developers on the location of new developments, to avoid locating potentially polluting activities in high vulnerability areas, without suitable engineering pollution prevention measures. By the end of 1999 the information regarding groundwater vulnerability and source protection zones will be integrated onto one map and will be available to the public. This will allow better informed judgements on the location of new developments, avoiding potentially polluting activities in high vulnerability areas, whilst allowing us to take a more pragmatic view in non-aquifer or low vulnerability areas.

2.3.6.3 Groundwater Regulations

As of 1 April 1999, the Agency acquires new powers with respect to controlling discharges to groundwater, called the Groundwater Regulations. The aim of the Regulations is to prevent the pollution of groundwater by controlling actual or potential discharges, and disposal associated with current activities.

Contamination may be caused by a wide range of activities, and the new Regulations will seek to address those activities which are not currently controlled by authorisations under the Waste Management Licensing Regulations and the Water Resources Act 1991, such as agricultural land spreading and sheep dip disposal.

The Regulations introduce a new system of authorisations for the disposal of certain listed substances. Before an authorisation can be granted, an application must be subject to "prior investigation", which could be a simple desk study through to a full site investigation with monitoring boreholes. The authorised disposal may be required to be monitored by "requisite surveillance" of the associated groundwater, to ensure that pollution of groundwaters is prevented. The Agency can in addition issue notices to prevent and minimise the entry into groundwater of these substances if required, and issue codes of practice for those industries which may unintentionally discharge such substances.

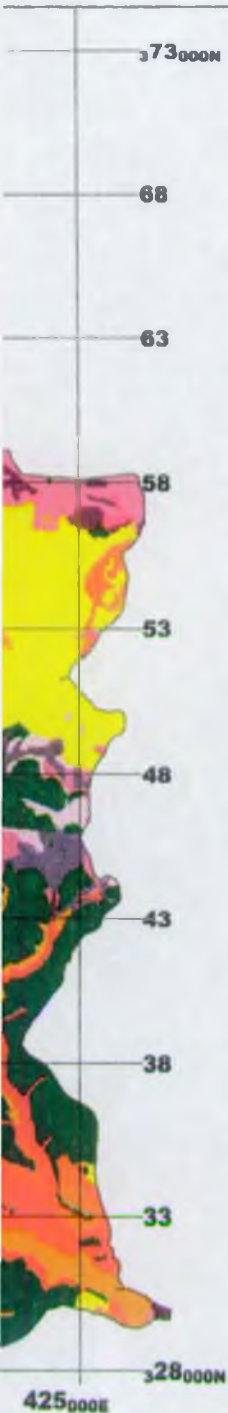
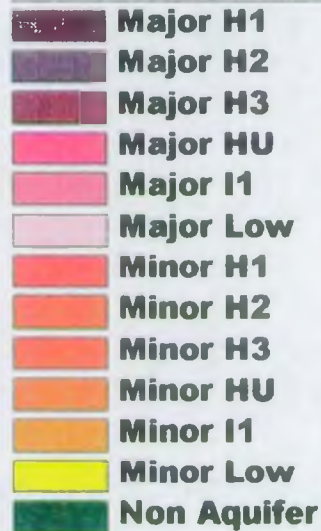


Map 21

Dove LEAP Catchment

Groundwater Vulnerability

Vulnerability Classification



For example, the Carboniferous Limestone in the Dove catchment forms a highly vulnerable aquifer. Groundwater is generally of high quality and provides baseflow to the streams and rivers of the area. It also supports abstractions for both potable, industrial and agricultural use. Any contamination of groundwater can therefore also affect surface water systems, as well as sensitive biological and geological features associated with the underground cave systems. The new Regulations will therefore have an important protective role in safeguarding this sensitive environment.

2.3.7 Water Resources Objectives and Standards

2.3.7.1 Statutory duties and powers

The Environment Agency has duties and powers to manage water resources under the Water Resources Act 1991 and the Environment Act 1995. The Agency has a duty to conserve, redistribute or otherwise augment water resources and secure their proper use. The principal mechanism for managing water resources is through the abstraction licensing system.

2.3.7.2 Water abstraction licensing

Water is abstracted from rivers, lakes and groundwater for a range of uses including public water supply, agriculture and industry. Although the Agency manages water resources for all, it is not in the Agency's power to guarantee that water will be available. The Agency regulates (or balances) these competing demands and the needs of the environment for water through the abstraction licensing system.

All abstractions (except for general agricultural and domestic use of less than 20m³/day and some other relevant exemptions) requires a licence under the Water Resources Act 1991. Licences enable the Agency to control abstractions by setting limits on the amount which may be taken, the purposes for which the water may be used and any necessary conditions to protect the environment and other users. Licences may be time-limited to allow for review.

An abstraction licence is only issued by the Agency if there is sufficient water available, the need for water is justified, all rights of existing users are protected and the water environment, for example river flows and wetlands, is not unacceptably affected. Details of abstraction Licences are held on a public register at our Area Office at Lichfield. Abstraction licence inspections are carried out to ensure that licence holders understand and comply with the terms and conditions of their licences.

2.3.7.3 Licences of Right

Previously, licences were issued under the Water Resources Act 1963 and consideration was not always given to the impact on other users nor the effects on the wider environment. Under this Act, water supply sources in use before 1963 were granted Licences of Right which did not consider impacts to the whole environment and were not time-limited. The Agency is required to compensate abstractors if we revoke or vary a Licence of Right and, consequently funding limitations reduce our ability to take effective action in this respect. A review of the abstraction licensing system is currently being undertaken by the Department of the Environment, Transport (DETR) and the Regions with the Agency and OFWAT. This recognises the problem of the legacy of Licences of Right.

2.3.7.4 Drought orders

At times of extreme water shortage, water companies may apply to the DETR for a Drought Order to relax abstraction licence conditions and/or the level of service they provide to customers. This may allow, for example, the temporary reduction in mains pressure or even periodic closure of supply. The terms of a Drought Order will also usually require the water company to introduce demand reduction measures, such as hose pipe bans.

The Water Industries Act 1991 places a duty on water companies to supply water to meet all existing and new domestic demands (regardless of the availability of water resources) if requested by landowners, occupiers or the local planning authority. This duty is currently being reviewed and is discussed further towards the end of this section. This Act also requires water companies to plan effectively to provide water supplies in their areas in the future, and to protect and enhance the natural environment in carrying out its functions.

2.3.7.5 European legislation

UK legislation implements various European Directives many of which are concerned with the quality of drinking water and are the responsibility of the water companies. Of concern to the Agency are the Surface Water Abstraction, the Groundwater and the Nitrates Directive which have been discussed previously in section 2.3.5.

2.3.7.6 Environment Agency National and Regional Water Resource Strategies

The Agency's national and regional strategies are directed towards two principal objectives:

- Securing a sustainable balance between water use and environmental requirements.
- Achieving a progressive enhancement of the water environment wherever historic development has proved detrimental to the natural balance of resources.

The Agency's strategy established three principles:

- Sustainable Development
- Precautionary Principle
- Demand Management

The document incorporates specific policies with an emphasis on initiatives which produce net environmental benefits and make use of under-utilised resources.

Agenda for Action

In October 1996, largely as a result of the 1995/96 drought, the previous Government set out its framework of policy and strategy guidance for water management in England and Wales in 'Water Resources and Supply: Agenda for Action'. The actions required by the Government, the Environment Agency, OFWAT, the Drinking Water Inspectorate (DWI), the water companies, manufacturers of water equipment and consumers were identified. The Agency was required to:

- Co-ordinate the fresh estimating of the reliable yields of water resource systems and publish the resulting information;
- Lead the testing of those estimates against climate-change scenarios;
- Revise, as necessary, its national and regional water resources strategies in consultation with the water companies; and
- Be fully involved with the water companies new resource development plans.

There are three particularly significant elements to this guidance:

- *Availability of water resources and security of supply:* The reliable yields of each water resource system need to be re-estimated and balanced against the maximum economic use of demand management. Re-estimations should take into account climate change and advances in hydrometric monitoring. However it should be noted that our understanding of the hydrological/ecological balance is still developing.
- *Demand management:* Efficient use, effective and equitable charging and economic levels of leakage control.
- *Future need for new water resources:* Options for bulk transfers of water or redistribution of abstraction licences should be considered before new resource development. Water companies are encouraged to co-operate with each other and the regulators in this respect, and to draw up plans for timely development of new water resources where demand cannot be managed within the existing capability.

In May 1997 the new Government presented a 10 point action plan to help secure reliable, efficient and environmentally sustainable water supplies. Actions included the following:

- Reviews on water charging and the water abstraction licensing system.
- New regulations to improve water efficiency.
- Mandatory targets on water company leakage.

Leakage control is a vital element of demand management and new mandatory leakage targets for the water companies for 1998-99 were announced by OFWAT in October 1997. The Government's 10 point action plan acknowledged the significant time necessary for the planning process to progress new water resource developments.

The Water Companies Association, representing 17 water-only companies presented *The Eleventh Point* which requests a formal requirement for planning authorities to consider water resource in strategic plans and for water companies to be made statutory consultees in the planning process. This was supported by environmental groups, including RSPB, World Wildlife Fund, Friends of the Earth and the Wildlife Trusts, who have also been challenging the Government to address the impacts of over-abstraction of water on wildlife and the countryside.

Such interest in water resources management and planning at this time was further set against the initiation of the Periodic Review of water company price limits to operate from 1 April 2000 to 2005 (AMP3). The programme is continuing and water companies will submit Business Plans to OFWAT in 1999.

The Agency's objectives for AMP3 are as follows:

- To identify the statutory environmental obligations which must be met by water companies.
- To ensure water companies prepare water resource plans on a consistent basis.
- To prepare an integrated, prioritised programme of non-statutory obligations, the National Environment Programme, to deliver water quality improvements and sustainable levels of abstraction to be funded within affordable price limits.

In August 1997 the Agency issued the water resources planning guidelines to the water companies to assist them in the development of water resources plans. These plans will be used to update the Agency's regional strategies, will facilitate a consistent input to AMP3, and will also enable the Agency to advise Government and others on the overall state of our resources. The Guideline clarifies the key specific obligations to be achieved in respect of water resources as follows:

Table 14 – Water resource obligations

Action	Environment Agency	Water Companies	OFWAT
Co-ordination of estimates of reliable yields ⁽¹⁾	•		
Estimation of reliable yields ⁽¹⁾		•	
Preparation of water resources plans ⁽¹⁾		•	◦
Improved leakage measurement, control and reporting ⁽¹⁾		•	◦
Assessment of the implications of climate change on yields ⁽¹⁾		◦	
Assessment of the implications of climate change on demands ⁽¹⁾	◦	•	
Advise OFWAT and Secretary of State on supply/demand balance for Periodic Review	•	◦	

Key: • Lead Body
 ◦ Supporting Body
 (1) Agenda for Action

The guideline gives guidance on methods, such as assessing the potential impact of climate change on the supply/demand balance, costs, and planning scenarios. The Agency will not publish individual submissions from water companies but they are encouraged to publish their water resources plans so that there can be increased transparency and openness in the water planning process.

In October 1997 the Agency invited local authorities, via a letter to the Local Government Association, to assist the Agency to identify those environmental improvements that are of most importance locally. The Agency's National Environment Programme will address those issues for which it has statutory duties and powers related to water company functions and will comprise schemes to:

- Improve water quality
- Restore rivers and wetlands that have suffered from excessive abstraction.

The Agenda for Action was reinforced by the Government in the November 1997 Water Summit, which emphasised the need for environmental protection. Significant and strategic issues associated with AMP3 negotiations and our National Environment Plan are discussed later in Section 3.4.2.

Saving Water. Taking Action 1998

The Environment Agency has a national Demand Management Centre which specialises in such management issues. The document details advice and initiatives for all.

Environment Agency Regional Water Resources Strategy

Sustaining our Resources was updated in 1997 to take into consideration the *Agenda for Action*, and advances in climate change and hydrometric techniques. The update concluded that there had been little significant change in distribution of resources across the Region since 1994 but that the overall surplus is likely to have declined due to an increase in demand. However, this may become balanced if the water companies achieve their targets. We still believe that progress can be made in sharing the overall surpluses by considering water transfers to meet resource deficits.

National Programme for Alleviation of Low Flows (ALF)

In 1991 the NRA investigated 92 rivers and wetlands suffering from low flows caused by over-abstraction and in 1993 identified low flows as priorities in its ALF programme. The Croxden Brook in the plan area is one such brook suffering from low flows and is highlighted as an issue in the Dove LEAP Consultation Draft and is included in the AMP3 programme.

2.3.8 Flood Defence Standards of Service

As an aid to decisions on priorities for works the Agency has 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 a comparison of different features on the same basis

Table 15 – Flood defence standards of service land use bands and targets

Land Use Band	Description	Target standard of protection (return period in years)
A	Contains residential and non-residential properties distributed over a significant proportion of its length. Amenity uses may be prominent	1 in 50 – 1 in 100 years
B	Reaches containing residential and non-residential property over some or all of the reach length but at a lower density than band A. Intensive agriculture may be present.	1 in 25 – 1 in 100 years
C	Isolated rural communities at risk with limited numbers of residential and non-residential properties. Agricultural interests will be more apparent than in bands A & B	1 in 5 – 1 in 50 years
D	Isolated properties at risk. Agricultural use will probably be the main use with arable farming a feature.	1 in 2.5 – 1 in 10 years
E	Very few properties at risk. Agricultural use will predominate with extensive grassland the main feature.	<1 in 2.5 years

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 targets.

2.3.9 Flood Warning Standards of Service

The Agency operates a flood warning service in England and takes the lead role in passing flood warnings to people at risk in order that they can take the necessary action to protect themselves and their properties. The latest technology is used to monitor rainfall and river levels for 24 hours a day, 365 days a year. The flood warning service is provided for certain reaches 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 and the public through a variety of media including AA Roadwatch, Teletext, radio and television. The Agency also provides a Floodcall 'dial and listen' service which provides 24 hour recorded information on the latest flooding situation. 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 them if flooding occurs.

Warnings are issued by the Environment Agency when river level gauges or a computer forecasting model of the river system show that flooding is likely. The flood warnings are colour coded according to the severity of the threat of flooding. Definitions of these are given in Table 16.

Table 16 – Flood warning classifications

Warning Type	Meaning
Yellow	A warning of flooding to some low-lying farmland and roads near rivers or the sea
Amber	A warning of flooding to isolated properties, roads and large areas of farmland near rivers or the sea
Red	A warning of severe flooding affecting many properties, roads and large areas of farmland

2.3.10 Nature Conservation Standards

The Agency's immediate concern is to enhance biodiversity. The approach to address this issue has been set out in the Agency's Environmental Strategy for the Millennium and Beyond. The Agency will:

- Play a full part in implementing the EU Habitats' Directive;
- Play a full and active part in delivering the UK's Biodiversity Action Plan by acting as the "contact point" for the chalk river's plan, and for 12 species of aquatic animals and plants, including the otter, the water vole, and rare species of fish, and by acting as the "lead partner", either singly or in collaboration with others, for 10 of them;
- Ensure that all aspects of the Biodiversity Action Plan are incorporated into the Agency's guidance and become part of its LEAPs;
- Implement a series of regional projects, in partnership with local conservation groups, to deliver biodiversity targets at specific sites;
- Allocate specific resources to conservation projects aimed at increasing biodiversity;
- Control eutrophication, where feasible, in order to enhance biodiversity;
- Improve the management of wetlands for conservation purposes;
- Use and promote best environmental practice for the protection and restoration of river habitats;
- Develop a set of criteria for all of the Agency's environmental licensing activities;
- Implement specific projects to restore habitats in rivers and lakes, increase the area of reed beds and other water plants, and improve river banks;
- Ensure that there is no deterioration in the quality of the aquatic environment in particular, and deliver significant improvements in river and still water quality tackling diffuse pollution of them; and
- Carry out research into the management of species in the aquatic environment in order to meet fully all biodiversity action plan targets.

Specific standards and objectives have been set out local Biodiversity Action Plans.

2.3.10.1 Biodiversity Action Plans

In June 1992, the largest ever gathering of world leaders met in Rio de Janeiro for the United Nations 'Earth Summit', reflecting a world-wide concern that human activities are changing and destroying the natural environment on an ever-increasing scale. Out of the summit came the UN Convention on Biological Diversity, which has now been signed by over 170 countries, including the UK. As part of this Convention the signatories were required to

produce national Biodiversity Action Plans (BAPs) to indicate how living heritage and biological resources were to be protected for future generations.

In 1994 the UK Government produced '*Biodiversity: the UK Action Plan*', and 1995 followed it with '*Meeting the Rio Challenge*', the first report of the Biodiversity Steering Group. This report identifies species and habitats of international and national importance, with costed action plans for selection of these. The action plans became official government guidance in 1996 after the UK Government formally endorsed the Steering Group.

If the UK BAP is to be successful, it requires some means of ensuring that it is translated into effective action at a local level. Local BAPs are seen as the means whereby this can be achieved. The Environment Agency plays a key role in partnering other organisations in the production of local BAPs and has lead responsibility for a number of species and habitats.

The Dove plan area falls within the area covered by the Staffordshire BAP, Derbyshire BAP and Peak District National Park BAP.

2.3.10.2 Water Level Management Plans

The 'Conservation Guidelines for Drainage Authorities' (MAFF/DoE/welsh Office 1991) states that Water Level Management Plans should be produced for all areas of conservation interest where water levels are artificially controlled with priority given to all sites of Special Scientific Interest. Guidance for their production is given in the MAFF booklet "Water Level Management Plans – A Procedural Guide for Operating Authorities" published in 1994, the following plans have been drawn up in accordance with this guidance.

The Upper Trent area of the Agency have produced eight Water Level Management Plans, two of which fall within the Dove catchment. The Water Level Management Plan for the River Churnet valley SSSI is currently out to consultation and the Old River Dove, Marston-on-Dove has been through the consultation stage and has been finalised and agreed by English Nature.

Each plan has a list of actions which will either maintain or enhance the interest on the site as well as gather more information to allow decisions on future management to be made. On sites where the Agency does not act as a drainage authority ie sites associated with ordinary watercourses, the production of Water Level Management Plans by District Councils has been less successful. The deadline for plan production is 1999 and it is important that all relevant authorities are made aware of their role in this process.

2.4 HEALTH OF THE ENVIRONMENT

2.4.1 Introduction

Traditional methods of assessing environmental quality have relied heavily on the taking of measurements with respect to established physio-chemical standards and criteria. As a consequence, data have accumulated over the years on the levels of certain substances that are considered to be acceptable or not, rather than by direct measurement of the state of the environment itself.

There are good reasons why this has been so. Methods for sampling and analysis for many substances are well-developed and convenient quantitative standards exist, and there is a direct link other control of emissions to the environment. An example of this is the extensive use of Biochemical Oxygen Demand (BOD) in water quality assessment. It is a measure of combined oxygen-consuming potential of different substances and is often used as an indicator of the level of organic pollution. Its actual impact on the dissolved oxygen level will however depend on all sorts of factors such as temperature, river flow, turbulence and so on. Thus although it is a useful water quality indicator, it is only a surrogate measure of the "health of the water environment". However, nearly all discharge consents are based on BOD so it is likely to be employed for many years to come.

Developments in the science of ecotoxicology are opening new avenues for more direct assessment of environmental health. New ecotoxicological techniques show considerable potential not only in providing direct measures of ecological condition but also in making the important link between the observed effects and their causes. Ecotoxicological databases are continually expanding, covering an increasing number of different species and different chemicals, providing a valuable source of interpretative information. A challenge for the future is the development of techniques that allow direct measurement of ecological health "symptoms" that are sufficiently robust and reliable for incorporation into national monitoring programmes.

The impact of endocrine (hormone) disrupting chemicals and their control are the subject of current Agency research projects and appropriate control strategies will be developed. The development of toxicity based control methods may assist in regulation particularly of complex mixture of pollutants. Although further development of techniques is required, this section reviews some topics which give a preliminary indication of the health of the Dove area environment.

2.4.2 Air Ozone

Production of ground level ozone is a consequence of the action of sunlight on mixed emissions of nitrogen oxides and Volatile Organic Compounds (VOCs). These arise from a wide range of hydrocarbon substances released, for example, as paints, glues and inks dry, and as petroleum products are used in road vehicles and in industry. Ozone is the major photochemical pollutant. It can damage crops and building materials and have significant health impacts, causing respiratory difficulties amongst sensitive people. Ozone occurs naturally in the atmosphere, but photochemical products of anthropogenic emissions have added to this natural background, raising the amount at ground level to an amount that can affect crops and people.

The control of ozone levels will depend to a great extent on the success of measures taken within the international community to control the emissions of ozone precursors. Ozone is one of the substances listed in the UK National Air Quality Strategy, which is discussed in Section 2.3.1. Map 5a shows ozone concentrations in the plan area.

2.4.3 Natural Radiation

We are all exposed to radiation all the time. Most people receive their greatest dose or exposure from natural radiation, mainly from radon. Radon is a natural radioactive gas. It comes from uranium that occurs naturally in all rocks and soils and is given off at the ground surface. We all breathe it throughout our lives. Out of doors, it disperses in air so levels are very low, but it can build up in enclosed spaces such as indoors where ventilation is poor.

The average radon level in homes in Derbyshire is 76 Bq m^{-3} and 44 Bq m^{-3} in Staffordshire. These figures are below the "Action Level" dose of 200 Bq m^{-3} recommended in the National Radiological Protection Board's Control Strategy in 1990. However, the whole of the Derbyshire Dales area lies within a geological area that is affected by radon. Derbyshire Dales District Council has pursued an awareness programme for residents on the effects of radon and adaptations to dwellings. By September 1998 41% of homes within the Dales area had been tested for radon gas. Effective remedial measures have been provided in 60 council houses at a cost of £60,000. For further information regarding radon levels in the Dales area please contact Derbyshire Dales District Council.

Map 22 shows Radon levels in the plan area.

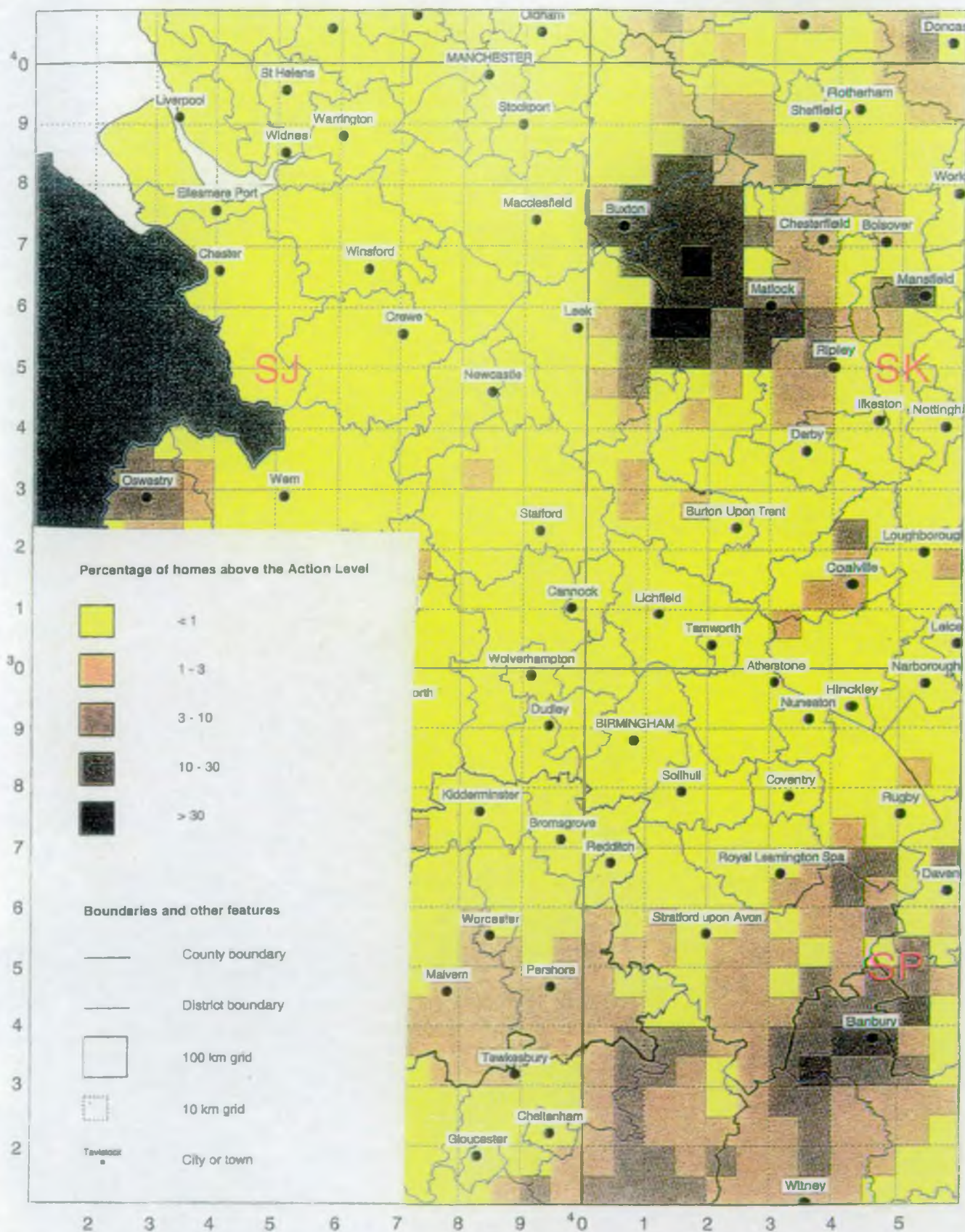
2.4.4 Acidification

Acid Rain is the name commonly given to the deposition of a cocktail of acidifying compounds to soils, surface waters and buildings. These compounds arise mainly from the combustion of fossil fuels. In some parts of the UK, natural ecosystems have a significant acid-neutralising capacity and acid rain has little impact on them. In other parts, the neutralising capacity is limited, and terrestrial and aquatic ecosystems are sensitive to acid deposition. In acid-sensitive areas, acid rain degrades the terrestrial environment and causes damage to plants and the soils in which they grow. Substances are released which run off into water bodies and are toxic to water life.

Acidic materials deposited directly from the atmosphere also have the effect of altering the acid balance in water bodies and this too has an effect on the life they support. Acidic deposition onto sensitive buildings causes decay of stonework and other materials.

The principal man-made emissions responsible for acid rain are sulphur dioxide and oxides of nitrogen. Ammonia, which arises mainly from agriculture, also plays a part. It combines with acidic compounds and neutralises them, the neutralised compounds break down when the products of these reactions are deposited; acidity is then released. As well as being deposited via rain, acidity is deposited from the water in clouds, and by the dry deposition of acidifying compounds. The highest areas of nitrogen deposition often correspond with the regions of highest rainfall: nationally in Scotland, along the high ground of northern England and on the Welsh hills and in the LEAP area around the Peak District. The highest deposition of sulphur compounds however, occurs in the area of highest emission.

Areas of the UK where critical loads for the deposition of acidity are exceeded for soils and fresh waters have been defined. For soils, there is a clear regional pattern, with the highest exceedence occurring in the most sensitive regions, notably Wales, the Pennines, and the Scottish Highlands, but also in certain parts of East Anglia and the south of England.



Map 22 Radon Levels in Staffordshire and Derbyshire
(Radon Atlas of England - NRPB-R290)

The exceedence of critical load for fresh waters gives a different regional picture, with the highest exceedences less widespread but localised in particular parts of the Pennines, western Scotland and north and south Wales.

Excessive deposition of one group of acid rain components, those which contain nitrogen, has the added effect of acting as a fertiliser and gives rise to changes in species composition of terrestrial and aquatic plant communities, affecting the animals that live on them.

The Agency is working to reduce SO₂ and NO_x emissions from power stations through the national plans and sulphur strategy. This sets national emission reduction targets to comply with international protocols in order to reduce exceedences of critical loads. We also seek to reduce emissions of SO₂ and NO_x from individual power stations and other industrial processes authorised under IPC. For example, by requiring the introduction of low-NO_x burners.

2.4.5 Water

The health of the water environment may be described by parameters other than standard chemical determinands such as BOD. Longer term trends are more appropriately assessed by using the biological measurement techniques and by sensitive species as mentioned. This section considers other parameters which may be examined now or in the future to provide cost effective methods as measures of the health of the environment. While information may not be available at present in an appropriate format it is hoped that the use of such methods may be considered and data collected by relevant agencies.

2.4.5.1 Eutrophication

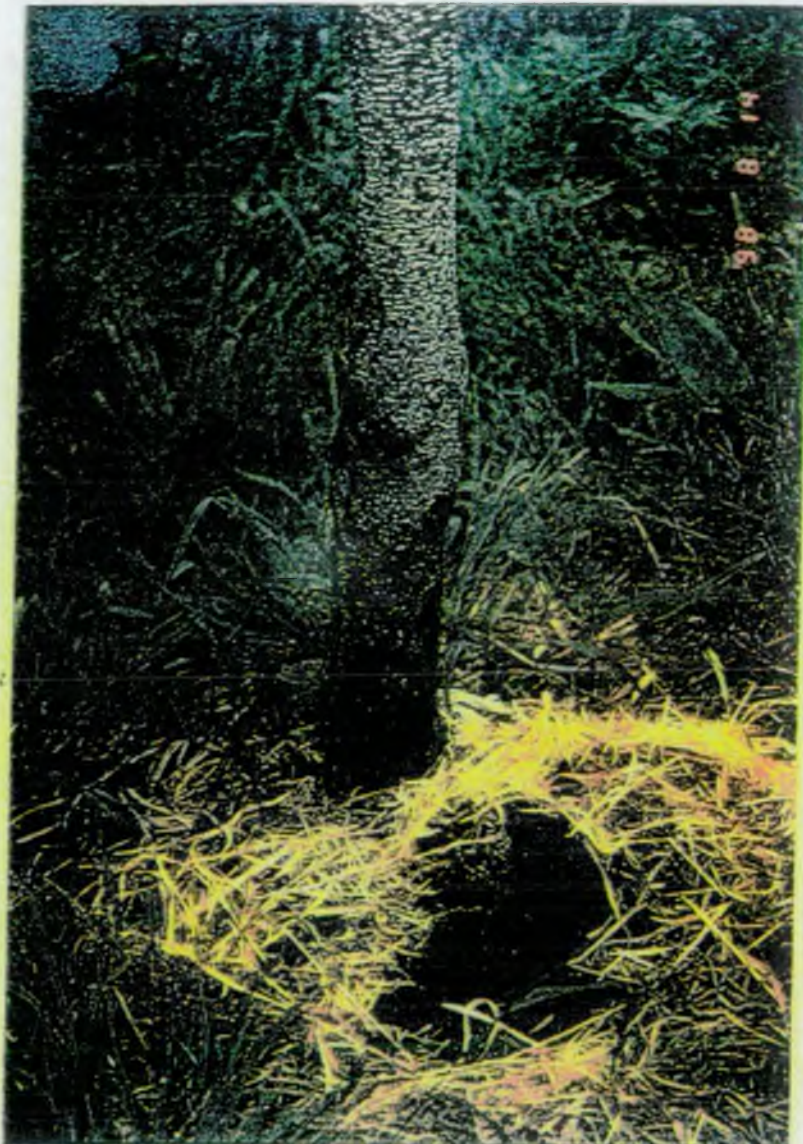
Eutrophication is the presence of excess nutrients in aquatic systems and can occur in both freshwater and marine environments. In the necessary conditions eutrophication can produce toxic blue-green algae, excessive growth of other algae or aquatic plants. Such blooms result in a range of effects such as clogging of waterways and sluices, reducing the enjoyment of water sports, deoxygenation of the water bodies and fish kills, to in extreme cases blooms of toxic blue-green algae blown to the shoreline, illness or death of wild, farm and domestic animals. While high nutrient levels indicate the potential for eutrophication, other environmental factors such as river flow dictate whether elevated nutrient levels are translated into algal growth.

Phosphate (principally from sewage treatment works) and nitrates (from agricultural fertiliser) tends to promote algal growth with phosphates being the limiting factor in freshwater and nitrates in the marine environment.

Staunton Harold Reservoir has been investigated as a Sensitive Area for the 1997 submissions under the UWWTD. This designation relates to water abstracted from the River Dove, where the abstraction point is at Eggington near the A38 crossing of the Dove. The Dove shows no signs of eutrophication with problems only perceived when the water is within the reservoir. Problems are exacerbated during the summer when the reservoir levels are low. It was not proposed as a sensitive area because of the limited scale of the problem and the cost associated with removal of phosphate at the four major works inputs on the Dove. There are no further designations proposed within the plan area.

2.4.6 Alder Disease (*Phytophthora*)

Photograph 1 – *Phytophthora* disease

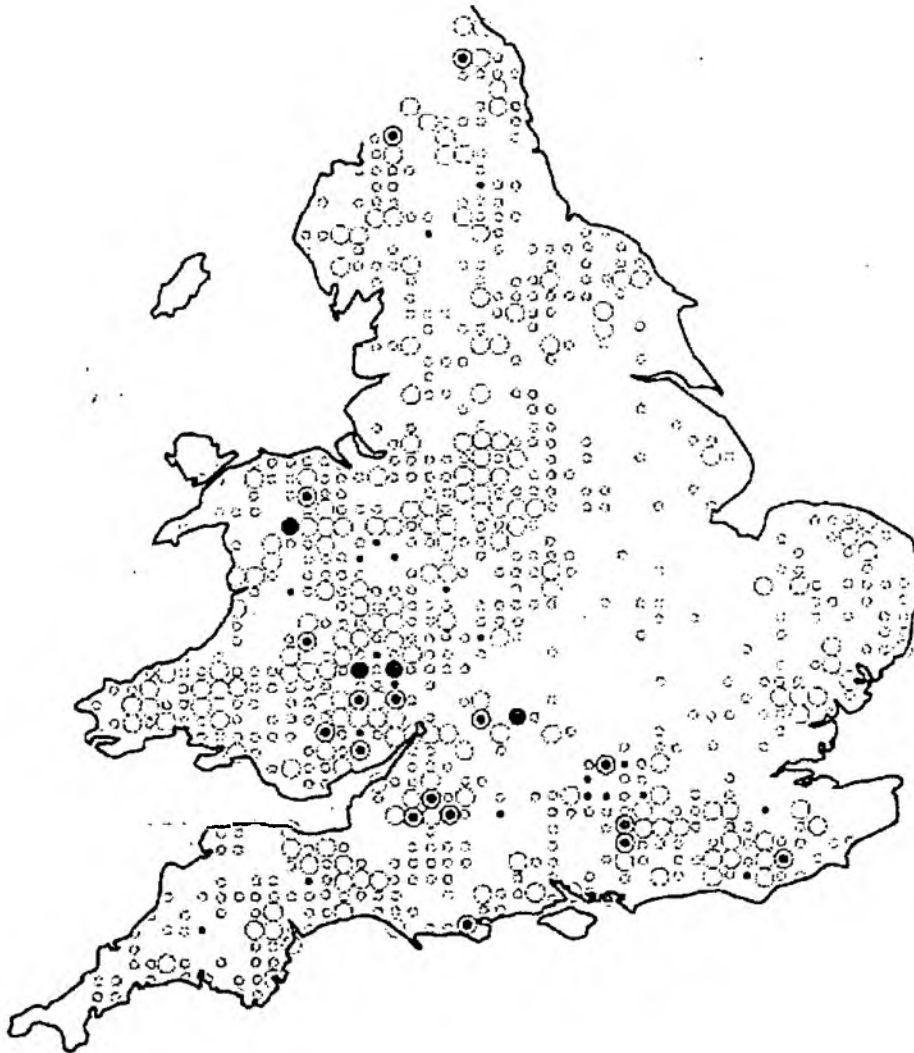


Alders are deciduous trees which thrive in damp, cool sites. In Britain the only native species is the common alder (*Alnus glutinosa*), which is often abundant along streams and rivers, where its roots help to stabilise the banks. Other species of alder present in the UK are the grey alder (*A. incana*) from mainland Europe, the Italian alder (*A. cordata*) and the American alder (*A. rubra*).

In recent years it has been recognised that alders can suffer from a lethal disease caused by a fungus of the genus *Phytophthora* which invade the stems and roots of trees.

Investigations made during 1994-1996 have shown that the disease is quite widespread in the UK, having been recorded as far north as the River Spey in Scotland. Information has been obtained from three sources: a Forestry Commission Research Agency survey of rivers over 8m wide; the Environment Agency's River Habitat survey; and reports from landowners. These give a good idea of both the distribution of riverside alders and of diseased trees.

Figure 3 – Distribution of alder disease



Distribution of Alnus glutinosa recorded during river habitat surveys in 1996, ○ = alders present; ⊙ = alders extensive; ● = diseased alders; ⊙ = extensive diseased alders.

2.5 LONG TERM REFERENCE SITES

2.5.1 Air quality monitoring

The Government, recognising that the quality of air that we breathe is critical to us all, established a new framework for improving air quality in the Environment Act 1995 (EA 95). The National Air Quality Strategy addresses the contribution to be made by industry, transport and local government to that improvement.

Under Section 80 of the EA 95, the Secretary of State has formulated a strategy for the assessment and management of the quality of air. This has required consultation with the Agency and other interested bodies.

The Agency has to have regard to the strategy in discharging its pollution prevention and control functions. Every Local Authority has to review present air quality, and compare this with standards and objectives laid out in the strategy.

Where there are difficulties in complying with the standards, Local Authorities shall by order designate an air quality management area in that part of its area where the problem exists. An action plan will then be prepared to manage the pollution levels down to the required level. Where processes under Integrated Pollution Control (IPC) are implicated in air quality problems the Agency will assist the Local Authority to achieve the desired air quality standard by reviewing the relevant conditions of the authorisation. This will be done in consultation with the operators of such factories.

In the Midlands Region of the Agency the inspectors are already assisting Local Authorities in establishing inventories of the pollution releases into their areas. This includes releases from processes regulated by the Agency, those regulated by the Local Authorities themselves, from other sources (diffuse domestic and commercial) and roads.

Air pollution levels are monitored by both Local Authorities and by the DETR.

2.5.2 Environmental Change Network

The Environmental Change Network (ECN) is a long-term integrated monitoring network established in 1993 and managed by the Natural Environmental Research Council. It aims to obtain comparable long-term data to identify and quantify environmental changes by distinguishing man-made changes from natural variations. The ECN monitors indicators that reflect environmental changes, together with measures of the responses of ecosystems to those changes, including direct responses of ecosystems to those changes, including direct responses (e.g. climatic effects on reproduction) and indirect responses (e.g. cumulative effects of air pollution on soil and water quality).

Nationally, there are currently 11 terrestrial sites and 38 freshwater sites. Standardised monitoring at most terrestrial sites began in 1993 for a core set of measurements including meteorology, surface water drainage, air chemistry, soil water chemistry, and fauna such as bats, birds and invertebrates. There are no ECN sites within the Dove catchment.

2.5.3 Harmonised Monitoring Sites

These are sites set up in 1974 by the Department of the Environment to provide a network of sites throughout the country where river quality data could be collected and analysed in a nationally consistent manner. Its purposes are first to enable estimates of loadings of materials carried down through river catchments to estuaries and second, to allow long term trends in river quality to be assessed.

There is one harmonised monitoring site within the plan area, Monksbridge on the River Dove. Ninety-four determinands are considered at these sites with the main ones to look at including Dissolved oxygen, Biochemical Oxygen Demand, Nitrogen and Phosphate. The following graphs show data collected from the one harmonised monitoring site in the Dove catchment at Monksbridge.

Figure 4 – N Oxidised (mg/l) Monksbridge

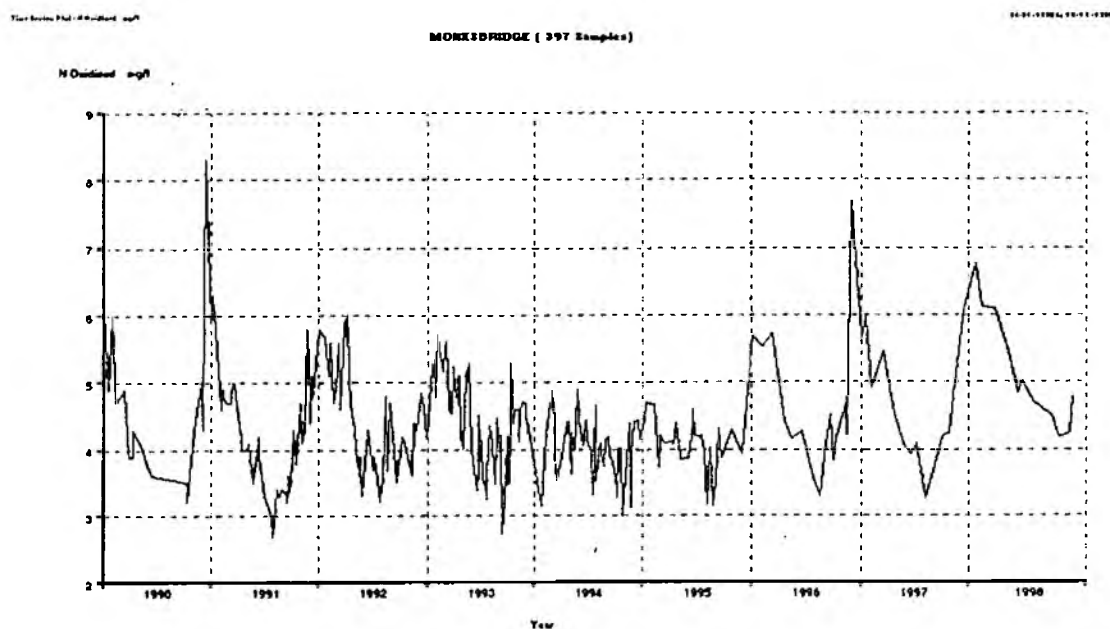
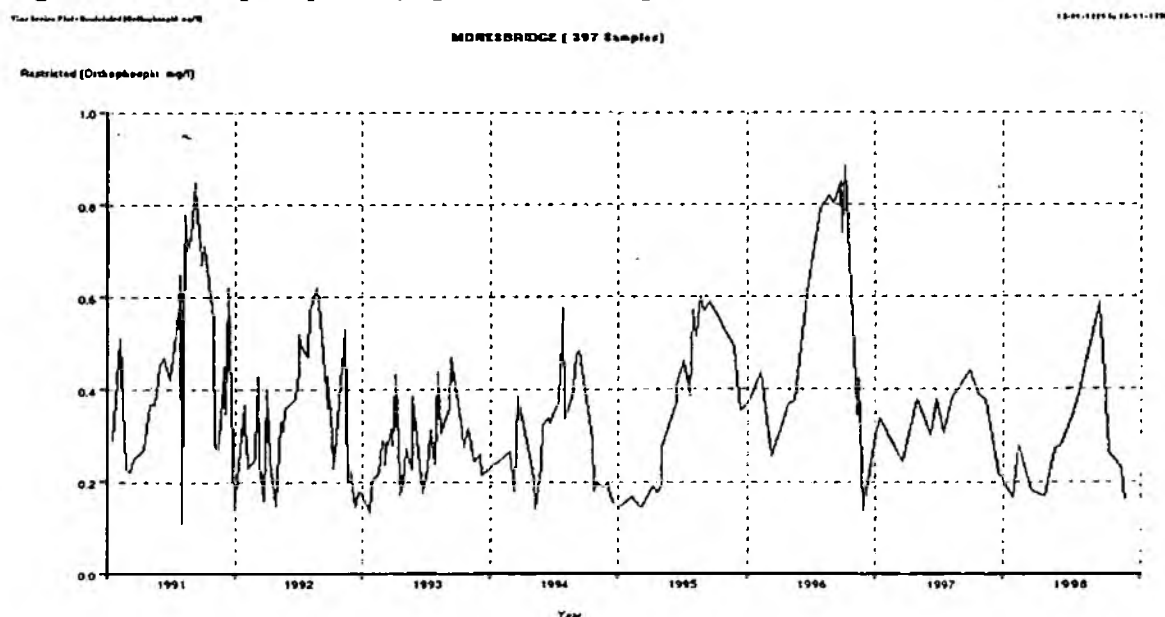


Figure 5 – Orthophosphate (mg/l) Monksbridge



2.6 AESTHETIC QUALITY

2.6.1 Introduction

The Government's main advisor on landscape protection and the conservation of local landscape character is the Countryside Agency. Nevertheless, the Environment Agency has a direct role in maintaining the appearance of landscape features through:

- Ensuring that water bodies are as attractive as possible, as well as being conducive to nature conservation and to recreation. This concern is not simply a question of landscape measures. It is also important to ensure that water appears acceptable for its use, so that films of oil, scum and algae, and sewage solids do not occur in water bodies;
- Regulatory control over litter on coastlines and along rivers;
- Regulatory control over combined sewer overflows to prevent the build up of sanitary and other waste;
- Role as a statutory consultee and influencing the local planning process;
- Regulatory control over the appearance of landfill and other waste disposal sites, to ensure litter, wind blow, or gull populations do not detrimentally affect an area.

The Agency also has an indirect control in that it takes a holistic view of environmental management and maintains strong liaison with the Countryside Agency, local planning authorities and others who are concerned about aesthetic matters.

The aesthetic quality of the Dove catchment is of strategic interest. The Dove catchment contains some of the most highly regarded landscapes in England. Topography, geology, natural history and human influence through settlement patterns and agricultural and other land uses have created a distinctive landscape character. The landscape value of the LEAP area is recognised not only by statutory and non-statutory designations but also by the high number of visitors attracted to it each year.

2.6.2 Tranquil areas

'Tranquil Area' maps were originally drawn from a strategic road project. They show at a strategic scale countryside which is relatively undisturbed by noise and visual intrusion. The Council for the Protection of Rural England (CPRE) has published regional maps of England at two dates: early 1960's and early 1990's. These show the change (mostly loss) of tranquility over the thirty year period. The simplest statistic, derived from GIS plotting, is that tranquility as defined regionally has declined from 63% to 50% of all areas of England.

Until about 1960 widespread disturbance to the countryside in England was mainly caused by urban development and roads carried only one quarter of the present traffic. Since 1960 the effect of roads, as well as new power stations, pylon lines and airports, has risen dramatically so that in many parts of England only detached pockets of tranquil countryside remain.

A tranquil area lies:

- 4Km from the largest power stations;
- 3Km from highly trafficked roads and from major towns and from some major industrial areas;
- 2Km from other motorways and trunk roads and from the edge of smaller towns;

- 1Km from medium disturbance roads and some main line railways;
- Beyond the noise zones of military bases and civil airfields.
- Beyond very extensive opencast mining

Within tranquil areas various sites are shown as zones of weakness, including large mining or processing operations, groups of pylons or masts, settlements greater than 2500 in population, some half-abandoned airfields and most windfarms.

The Dove catchment falls within the East and West Midlands areas of the CPRE's analysis of tranquil areas. The following tables summarise the change in tranquil areas over a thirty year period for the East and West Midlands; this information is also shown in maps 23 and 24.

Table 17 – Area of tranquility (sq km) -

	1960's	1990's	Change	% loss
East Midlands	10,906	8,685	-2,221	20
West Midlands	9,101	7,221	-1,880	21

Table 18 - % of region which is tranquil

	1960's	1990's	Change
East Midlands	70	56	-14%
West Midlands	70	55	-15%

Table 19 – Average size of tranquil area (sq km)

	1960's	1990's	% change
East Midlands	168	46	-73
West Midlands	202	55	-73

2.6.3 Landscape Assessments

The Agency encourages the preparation of landscape assessments of river corridors in order to determine the character of such areas and to help the assessment of potential impacts of proposals for such areas.

The Government and the Countryside Agency are keen to emphasise the need to conserve local character. This principle applies whether or not the landscape has been designated for its national importance. To promote that objective, it has assessed the landscape of the whole of England and divided the country into a series of Countryside Areas. While these areas are too broad to be used for development control purposes, and the Countryside Agency advocates more detailed landscape assessments at the local plan level, its assessment is very appropriate for the strategic planning at structure plan and LEAP scale.

The Environment Agency has commissioned a landscape assessment study of the LEAP area by Pleydell Smithyman Limited but this is yet to be completed.

A document titled "Planning for Landscape Change: Supplementary Planning Guidance to the Staffordshire and Stoke on Trent Structure Plan 1996-2011", appropriate to this plan area, has recently been produced by City of Stoke on Trent and Staffordshire County Council. It describes the approach being taken by these councils with respect to landscape policy and takes account of recent government guidance on the application of an understanding of landscape character to decision-making on development and land use change, as a preferred alternative to the use of local, non-statutory landscape designations.

2.6.4 Litter

The Agency is concerned with the impact of litter on the environment because:

- A build up of litter can block drainage channels and lead to a danger of flooding;
- Accumulated litter can be a fire risk, which in turn is detrimental to air quality;
- Certain parts of litter can, if left, pose a potential water pollution problem;
- Litter is aesthetically unpleasant, and can reduce people's enjoyment of recreation on or adjacent to water features, or even deter them from visiting such sites;
- Litter can pose a health a safety risk.

In this section, reference to litter generally relates to the placing, by intent or otherwise, of materials in an illegal or unwarranted location by the public. It does not include discharges of material or tipping on sites by industrial concerns. Litter can arise from the following sources:

- Sewer outfalls with little screening or macerating, releasing faecal, other organic and inorganic matter into rivers or the sea and thence being deposited on river banks or the sea shore;
- Discharge of material at sea;
- Flytipping;
- Accidental spreads of material from Licensed sites; and
- Incremental collection of material dropped by individuals in the countryside. We are generally concerned only when this litter is deposited close to or in water bodies.

It should be noted that responsibility for removal of litter lies with riparian owners, district councils or unitary authorities rather than the Agency.

3.0 Introduction

This chapter looks at the pressures on the environment, which can be thought of as different sets of **stresses**, and the manner in which they affect the state of the environment as causing different **strains** upon it. The pressures themselves arise from both natural forces and from human influences. The success of the Agency's actions will be judged on how far it has been able to reduce or alleviate the pressures. For example, the quantities of substances abstracted from or discharged into the environment, plus other measures of events such as pollution incidents, and, ultimately, change the state of the environment itself.

The aim of the Stresses and Strains framework is to allow the Agency to assess and analyse the extent and magnitude of the pressures and their impacts. This will help the Agency to prioritise its actions and manage the stresses more effectively. It will also allow the results of actions by others, including the general public, to be gauged over time.

The framework is based upon the following six categories:

- **Natural forces**, including weather and climatic variations such as the extent and rate of temperature change, storminess and rainfall patterns.
- **Societal influences**, which are perhaps the most pervading and wide ranging of all the pressures on the environment, from the size and distribution of population to transport and recreation.
- **Abstractions and removals**, including the removal of water, minerals and materials such as peat. Other factors such as fishing intensity and the cropping of trees are also included.
- **Usage, releases and discharges**, covering emissions from fixed and mobile sources and cumulative input from diffuse sources such as fertilisers and pesticides.
- **Waste arisings and disposal**, including the by-products of industry and society in general. The handling and disposal of this waste using methods such as landfill or incineration.
- **Illegal practices**, covering pollution incidents affecting air, land and water. Other issues such as fly tipping and the extent of organised environmental crime are also included.

3.1 NATURAL FORCES

These include climate variations and also other natural pressures that may require some form of action to mitigate or ameliorate their potential effects.

3.1.1 Climate Change

3.1.1.1 Introduction

Global average surface temperatures have increased by 0.3°C to 0.6°C since the late 19th Century. Nine out of the ten hottest years on record have occurred since 1983, and 1997 was the warmest year yet. Of the six warmest years in Central England's 338 year old temperature record, four (1989, 1990, 1995 and 1997) have occurred in the last ten years. The summer of 1976 was the warmest ever, and that of 1995 the second warmest. Studies of these trends show that they are statistically significant and are unlikely to be entirely natural in origin.

Burning of fossil fuels for transport and industry and deforestation has led to an increase in the amount of "greenhouse gases" in the atmosphere. These gases including carbon dioxide are believed to contribute to long-term climate change. Other greenhouse gases are released via other means, such as methane from landfill sites.

Increasing atmospheric concentrations of greenhouse gases originating from human activity are expected to change the earth's climate markedly over a 25-100 year timescale, with potential wide ranging consequences. To tackle this threat, 153 countries signed the United Nations Framework Convention on Climate Change which came into force in March 1993. Under the Convention, developed countries, such as the UK, agreed to take measures aimed at returning emissions of greenhouse gases to 1990 levels by the year 2000. In 1994, the UK was the first Convention signatory to publish plans to achieve this target. It is expected that the UK carbon dioxide emissions will be 4 to 8 per cent below 1990 levels in 2000, with methane emissions 24 per cent and nitrous oxide emissions 34 per cent below 1990 levels in 2000.

3.1.1.2 Climate Change in the UK

There is considerable uncertainty about how predicted global changes in climate will affect the UK. Scenarios will continue to evolve as the ability to model the effects on climate systems improves.

The effects of climate change in the UK are likely to be mixed with losses and gains that vary from region to region and sector to sector. Beneficial effects may occur to forestry, pastoral farming and to tourism and recreation, whilst adverse effects may occur to soils, wildlife, water resources, arable agriculture, the insurance sector and human health.

3.1.2 Flooding

Although the absence of sufficient water at certain times of year, at certain places, imposes a variety of pressures on the environment, at other times of year an uncontrolled excess of water creates a number of different pressures. Flooding can occur as a result of rivers and canals overflowing, by the occurrence of tidal surges in estuaries, and by the impact of sea directly on low lying coastal land. Nearly 5000 Km² of land in England and Wales are below sea level and are protected from inundation by natural or man-made defences.

3.1.2.1 Main River

Under the Water Resources Act 1991, the Agency has a responsibility to exercise general supervision over all flood defence matters, and has specific responsibilities for main rivers – which are defined on statutory maps – and for sea defences in areas which are not privately owned. Main rivers are designated by the Ministry of Agriculture, Fisheries and Food, and are usually larger streams and rivers, but also include smaller watercourses of strategic drainage importance.

Whilst the responsibility for the maintenance of any watercourse normally rests with the riparian owner, that is the owner of the river bank and bed, certain reaches of the river system are formally designated as "Main River". On Main Rivers the Agency has permissive powers to construct and maintain flood defences and to control the actions of others through Bylaws and the issuing of Land Drainage Consents. District and County Councils have permissive powers to carry out works on ordinary watercourses, those not designated as Main River, and to make Bylaws although this still requires the Agency's consent.

3.1.2.2 Flood Defences

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 eight metres of those watercourses designated as Main River, and over the construction or alteration of culverts, mill dams, weirs or other like obstructions in ordinary watercourses. Wider control over the river system in relation to development is achieved through the Town and Country Planning Acts and the Agency's role as a statutory consultee.

Flood defences have been constructed in many parts of the catchment to provide protection for property and agricultural land. These are generally either hard defences (flood walls made of brick, concrete or sheet piling), or soft defences (earth embankments). There are extensive flood banks on the River Dove between Marchington and Egginton as well as on the Endon, Henmore, Picknall, Foston and Hilton Brooks.

The Agency's mathematical modelling exercise of flood flows on the River Dove at Marston-on-Dove to the head of main river at Mappleton was completed in early 1998. The model has been used to appraise the need for upgrading the existing flood defences or providing additional defences. In the light of the appraisal, repair works have been carried out to the existing flood defences at Scropton and the need established for flood defences in the Hatton / Tutbury area. A scheme providing a 1 in 100 year protection for the location has been included in the capital programme.

As an interim measure during Summer 1998 the Agency constructed a minor flood bank adjoining Old Marston Lane providing a 1 in 10 year protection and the existing flood defence in Station Road was repaired together with enlargement of the flood relief openings under the old tramway crossing of the River Dove.

Other forms of flood protection have been provided within the catchment. On the Henmore Brook at Ashbourne, a balancing lake has been constructed to restrict flows through a culvert under the town which cannot cope with flood flows. At Leek, a bypass channel on the River Churnet has been completed over recent years which has reduced the risk of flooding to a number of residential and industrial properties, however the scheme is being re-appraised following the severe flooding in October 1998, which exceeded the design capacity.

3.2 SOCIETAL INFLUENCES

Where humans live and work pressure is exerted on the environment. These are perhaps the greatest and all-embracing pressures placed upon the local environment and range from the impact of population levels to heavy industrial processes.

3.2.1 Population

The population of England and Wales has grown from 48.89 million in 1970 to 52.01 million in 1996, an increase of 6.4%. Around 110,000 people live in the Dove catchment.

Table 20 – Population statistics

Major Settlements	Population
Leek	19,801
Cheadle	11,263
Uttoxeter	10,329
Ashbourne (Town Only)	6,340
Tutbury & Hatton	5,729

(Source: Census Data 1991)

It is the changing behaviour of the human population such as the use of different means of transport that the principal pressures arise.

3.2.2 Households

There are 20.5 million dwellings housing around 50 million people in England. There has been a steady increase in the number of households in England and Wales since the 1970's reflecting the slight increase in population and a move to people living alone. The number of households is projected to grow at a faster rate than the population over the next 20 years.

Table 21 – Housing figures

Households	1991	1996	2016	Change (1991-2016)
Total No. households (million)	19.2	20.2	23.6	4.4
One person households (million)	5.1	5.8	8.6	3.5
Average household size (persons)	2.47	2.39	2.17	-0.3

(Source: DETR)

The predicted increase in households has three basic components: population change, behavioural changes and greater life expectancy. In the UK household growth will mainly be in the South West, the South East, Cheshire and the East Midlands. Within the plan area housing development will be concentrated around Cheadle, with around 550 new dwellings proposed by the town by 2001, and Ashbourne. Other smaller developments are proposed for Uttoxeter, Rolleston, Hilton and Rocester.

The increase in the number of households is projected to contribute to the expected increase in the area of land in urban use and hence a loss to the rural environment. Some 169,000 hectares (1.3% of England's land area) are projected to change from rural uses to urban between 1991 and 2016, i.e. a rate of 6,800 hectares per year. By 2016, 11.9% of England's land is predicted to be urban compared with 1.6% in 1991.

Households exert pressure on the environment by using energy and water and generating waste. They consume about 30% of the energy used in the UK but, if passenger transport is included, this rises to 50%. Households consume 20% of all water supplied, and 5% of controlled waste is generated in the home. More households will require more energy, goods and services, and increased use of transport.

The domestic sector is one of the largest users of energy (30%). Domestic energy consumption increased by 16% between 1970 and 1995, although the amount used per household has remained relatively constant and the overall growth is related to the increase in number of households. Household appliances account for about a quarter of electricity consumed in the UK. The Home Energy Conservation Act aims to reduce carbon dioxide emissions from domestic properties by 30% by the year 2007. Local Authorities are responsible for achieving this reduction.

Nearly 70% of households in England and Wales have at least one car. Twenty per cent of these households have two cars and 4% have three or more cars. Emissions from vehicle exhausts contain nitrogen oxides, carbon dioxide, carbon monoxide, volatile organic compounds (VOCs) and particulate matter.

Direct emissions to air by households occur through the use of solid fuels, oil and gas, and use of paints and solvents. Households are responsible for 19% of the UK's black smoke emissions, 4% of carbon monoxide, 3% sulphur dioxide, 3% nitrogen dioxide and 1% of the UK's VOC emissions. But, if the emissions from power stations as a result of energy used by households are also included, households are responsible for 21% of the UK's black smoke emissions, 8% carbon monoxide, 27% sulphur dioxide, 11% nitrogen dioxide and 4% of the VOC emissions.

In the plan area about 140 litres of water per person is used every day. Household use of water has increased significantly over time, reflecting changes in household appliances, lifestyles and expectations. In 1972 only 66% of households had washing machines, whereas this had risen to 90% by 1996. Efficient use of water is necessary to reduce or at least minimise the increasing demand for water. Toilets and baths use more than half of the water in the home. A five-minute shower instead of a bath can save an average of 55 litres of water. Heavy-duty plastic bags ('Hippos') and other devices can reduce the amount of water used to flush toilets. The use of water in the garden has also increased in recent years.

Most of the water used by households (80%) is returned to rivers or estuaries after sewage-treatment. Natural human waste contributes organic matter and nutrients such as phosphorous in sewage. Some detergents also contain phosphorous, although changing formulations have led to a decline in the 1990s. Metal and chemical products are widely used in the home. Some metals are dissolved from water pipes and solder, other substances including metals are contained in cosmetics, toiletries, medicines and domestic cleaners. Sewage-treatment normally reduces these to harmless levels but it is not always known what these harmless levels are. Recent work has suggested that even at low concentrations some substances may have a harmful effect on the environment. The use of pesticides and herbicides in gardens, wrong connections from 'DIY' plumbing and misuse of road drains for oily residues create problems in fresh waters. More than 1,000 water pollution incidents in the UK in 1995 were attributed to domestic or residential premises and in 1998 the Upper Trent Area had 49 incidents of which 7 were in the Dove catchment.

Waste arising directly from households accounts for around 4 to 5% (16 to 20 million tonnes) of the waste produced annually in the UK. Each household in Britain throws away about one dustbin full of rubbish every week. By weight, the average dustbin contains paper and cardboard (30%), food scraps (25%), glass (10%), metals (8%), plastics (8%) and textiles, dust and other substances (19%). About half of household waste could be recycled. It is estimated that only around 5% of household waste is recycled or composted in the UK. The Government has set a target for the recovery of 40% of household waste in England and Wales by 2005.

We each consume about one kilogram of meat and fish, and three kilograms of fruit and vegetables every week. The UK's self-sufficiency in food production was about 33% at the time of the First World War. In 1996, UK agriculture produced just over half (53%) of the food and animal feed consumed, and nearly 70% of the types of food which can be grown in the UK. More than three-quarters of the UK land area is used for agriculture. We demand high quality food with a long shelf life, resulting in widespread use of chemicals in food production. Currently, less than 1% of UK agricultural land is farmed using organic methods.

Household expenditure on recreation, entertainment and education has increased substantially since 1971, reflecting the real rise in household disposable income over the same period. Part of the increase in recreational expenditure relates to the time spent in the natural environment. Five thousand million leisure day trips were made to the countryside and coast during 1996. A quarter of all day trips were to the countryside (26%) and 3% were to the seaside or coast. Households can influence industry through their spending on goods and services. Schemes like the EU ecolabel award scheme have been set-up to enable consumers to consider the environment when making choices. Going for Green and the Agency have developed computer software called EcoCal. EcoCal assesses an individual household's impact on the environment. Residents of the UK can obtain a copy from Going for Green by calling 0345 002100.

3.2.3 Development Pressures

3.2.3.1 Planning

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. The Agency has a responsibility to protect the environment and 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 on matters relevant to the Agency.

The Agency operates at all levels of the planning system. At the national level there is direct liaison with the DETR (Department of the Environment, Transport and the Regions) and Local Authority associations, seeking to influence Planning Policy Guidance Notes (PPG), Circulars and new legislation. At the regional level there is liaison with government offices and regional steering groups with the aim of influencing regional planning guidance. At the local level we are consulted on structure and local plans, mineral local plans and waste plans to ensure our interests are protected and that development proposals have positive (sustainable) impacts on the environment.

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 the planning matters rests with the LPA, government guidelines advise on the need to consider the Agency's concerns when determining proposals.

There are two structure plans within the Dove plan area, which are prepared by the County Councils of Derbyshire and Staffordshire. These plans provide a broad strategic framework for planning and development control. The Derby and Derbyshire Joint Structure Plan has been prepared jointly by Derby City Council and Derbyshire County Council.

The existing statutory local plans and those currently in preparation are shown in Table 22.

Table 22 - The status of Development Plans within the plan area

LOCAL PLANNING AUTHORITY	DEVELOPMENT PLAN TITLE	STATUS AND CONSULTATION DATE
DERBYSHIRE COUNTY COUNCIL	Derby & Derbyshire Joint Structure Plan	Deposit Draft April 1998
Derbyshire Dales District Council	Derbyshire Dales Local Plan	Deposit Draft February 1998
High Peak Borough Council	High Peak Local Plan	Adopted April 1998
South Derbyshire District Council	South Derbyshire Local Plan	Adopted March 1998
STAFFORDSHIRE COUNTY COUNCIL	Staffordshire and Stoke on Trent Structure Plan	Deposit Draft January 1999
East Staffordshire Borough Council	East Staffordshire Local Plan	Adopted Plan expected soon
Staffordshire Moorlands District Council	Staffordshire Moorlands Local Plan	Adopted Plan expected soon
PEAK DISTRICT NATIONAL PARK AUTHORITY	Peak National Park Structure Plan	Adopted April 1994
	Peak National Park Local Plan	Local Plan Inquiry held in spring 1998. Not adopted yet.

Notes:-

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

3.2.3.2 Development in the floodplain

River channels have a limited capacity and when this is exceeded, flooding of the adjoining land known as the floodplain occurs.

The need to protect floodplains has not always been recognised and they have sometimes been subjected to inappropriate development. Rivers and their floodplains are finite resources, which need to be managed in accordance with the principles of sustainable development.

If flood risks to land and property are not to be increased and the ecological value of rivers and floodplains is to be safeguarded, then rivers and their floodplain need to be protected from activities, such as development, which may adversely affect them.

3.2.4 Surface water management

There is an increasing demand in the LEAP area for suitable land for development for both residential and commercial reasons. This requirement for land raises two specific issues with respect to surface water management.

- Development of the floodplain (see 3.2.3.2)
- Surface water discharges – developers / planners need to be better informed to enable early recognition of the possible need for surface water management. In appropriate cases the Agency will recommend Sustainable Urban Drainage Systems (SUDS) – reference Agency Booklet “Sustainable Urban Drainage – An Introduction”

Development of land invariably leads to the increase in the area of impermeable surfacing, with greater, more rapid surface run-off during rainfall. Developers are encouraged to take account of this effect when drawing up their proposals for surface water drainage, taking account of the possible need for SUDS systems involving local storage facilities with controlled discharge into watercourses. For sustainable urban drainage to be effectively implemented at a site, the system needs to be incorporated into a developer's plans at the earliest stage possible not least because its use may influence land purchase and site layout decisions.

3.2.5 Water demand and management

Within the catchment there is a need to satisfy strategic requirements for growth in population and industry while balancing the needs of the consumer and the environment.

Water is abstracted from both surface and groundwaters throughout the catchment for public, private, industrial and agricultural purposes as has been described earlier. The effects of this are of a generic nature throughout the catchment and have been addressed in the Dove LEAP Consultation Draft.

3.2.6 Transport

3.2.6.1 Introduction

Transport exerts pressure on the environment in many ways, particularly road transport which accounts for over 90% of passenger travel in the UK, and over 80% of the freight. Air pollution in the UK has traditionally been associated with industrial activity and the domestic burning of coal. However, industrial emissions are being reduced through the work of the Agency and Local Authorities but the pollution associated with transport is less straightforward. Vehicles emit a variety of gases, particulate materials and other substances into the atmosphere and actual road construction places pressure on the countryside.

In recent decades transport emissions have grown to match or exceed other sources of many of the most important pollutants. Many road improvements have been undertaken in the catchment recently, the major one being the completion of the A50 (M1-M6 link) road which follows the route of the River Tean and the lower reaches of the River Dove. The creation of this road will lead to new urbanisation pressures and pressure for development of large industrial sites along the corridor. The scale and nature of these developments will lead to increased loss of habitats and reduce the ecological diversity, increased traffic will also cause an increase in transport emissions.

Table 23 – Contribution from road transport to UK emissions

Pollutant	1995 National emissions (Ktonnes)	% of national emissions from road transport
Benzene*	39	67
1,3 Butadiene*	10	77
CO	5478	75
Lead	1.47	78
NO _x	2295	46
Particulates – PM ₁₀	232	26
SO ₂	2365	2
VOCs	2337	29

* 1994 estimate used (source: DETR)

In some areas, particularly in towns and cities they have become the largest cause of air pollution. This is due to the large increase in road traffic over the period. Between 1984 and 1994 the number of cars increased from just over 16 million to about 20.5 million. The distance they were driven increased significantly and is projected to continue growing. A large percentage of trips are very short, these are disproportionately polluting.

The need for an integrated transport strategy to reduce the need to travel, and promote more environmentally acceptable forms of travel is recognised at national, regional, strategic and local levels in government. The Agency will support the efforts of government at all levels where appropriate, to reduce the pressures from road transport on the air, water and land.

3.2.6.2 Staffordshire Travelwise Award Scheme

The travelwise award scheme is aimed at raising awareness of the problems associated with road traffic and actively promotes the introduction of alternatives to drive-alone journeys in the car as part of corporate strategy. This is done by using incentives and organisational means to encourage employees to make informed choices. Travelwise is not about banning cars rather it is about widening that individual choice, by investigating and optimising complementary modes of transport in the workplace.

3.2.6.3 Tyres

Tyres play an essential role in today's society. We rely on them for personal transport by car, bus, and bicycle, and for the transport of food and other goods by lorry. There are over 121 million tyres on vehicles in Great Britain – a number which is increasing. The number of road vehicles and distances travelled have more than doubled in 30 years and more tyres are being used.

Tyres and the environment

Energy use – besides using energy in their manufacture (about six litres of oil per car tyre), fuel is consumed during their lifetime overcoming friction. Tyre pressures affect energy efficiency. Correctly inflated tyres are essential for safety, consume less energy, and will last longer. Energy consumption can also be reduced by up to 5 per cent by using energy-efficient tyres.

Tyre noise – at speeds of greater than 50 Km per hour (just over 30 miles per hour) tyres are responsible for the majority of noise from cars. The level of tyre noise is dependent on the nature of the road surface as well as factors such as vehicle speed and the volume of traffic.

Tyre wear – as tyres are used, small particles are worn off which can pollute the environment. Pollutants from roads can be washed into the ground and rivers, and eventually estuaries and the sea. Zinc, copper and cadmium from tyre wear all contribute to contamination of the environment by road runoff.

Illegal dumping and tyre fires – forthcoming legislation is likely to ban tyres from being put in to landfill sites. Options for recycling material and recovery from tyres are needed. Without these options the environment is at risk from illegally dumped tyres and potential tyre fires. Uncontrolled burning from tyres produces substances which can harm the environment. These can affect air and water quality, and contaminate soil and vegetation. Black smoke, and other pollutants are released into the atmosphere. Water used to control the fire or rainfall causes these pollutants to be washed into the ground or to runoff into nearby watercourses.

The Agency believes that more effort is needed to increase the lifetime of tyres, to reduce environmental impacts during their use, and to provide a range of sustainable ways of recovering them as a resource at the end of their lives. One such option is using tyres as a source of energy, this is being carried out in the Dove catchment at Blue Circle Cement Works, Cauldon.

Tyres and energy – Blue Circle Cement Works, Cauldon

The making of cement must be authorised by the Environment Agency under the Integrated Pollution Control provisions of the Environmental Protection Act 1990. The process is regulated by the Agency to ensure that emissions are, wherever possible, prevented or minimised. Any substances that are emitted must be rendered harmless.

After trials in 1994 to ensure that there would be no detrimental effect on the environment, the Environment Agency permitted Blue Circle, Cauldon, works to burn scrap tyres in their kilns. Tyres have a high calorific (fuel) value, and this is an environmentally beneficial usage in that it reduces consumption of fossil fuels and helps to relieve the considerable environmental problems posed by the large quantities of scrap tyres generated every year.

Although the tyre burning trials seemed to show a reduction in some pollutants compared to the coal and coke normally used, tyre burning is perceived by the general public as a highly polluting activity.

The use of waste-derived fuels in general in cement kilns and similar combustion processes has been growing, and there has been growing concern over how the use of such fuels is regulated. To this end the House of Commons Select Committee on the Environment has made recommendations on how the Agency's regulatory activities could be strengthened.

In addition the National Air Quality Strategy, which is implemented through the Local Authorities, includes objectives for maximum acceptable levels of particulate matter, sulphur dioxide, and other pollutants released from the Cauldon works. Both the Agency and the Local Authority therefore need to ensure that the contribution from the works to local ambient levels is acceptable.

3.2.7 Energy

3.2.7.1 Energy use

Table 24 gives the national proportions for delivered energy in the UK in 1995, which was 155.77 million tonnes of oil equivalent. Energy use in the Dove catchment should not be substantially different from these proportions.

Table 25 gives the proportions delivered energy use by sector. Road transport is a major user of fossil fuels, accounting for over 40% of total UK use of petroleum products. Consumption of energy in the UK has been rising for some years, with falling energy prices. The full liberalisation of the electricity market in 1998 provided opportunities for the support of more environmentally acceptable power generation projects, but may have undesirable environmental consequences if this leads to lower prices and higher electricity demand.

Nationally, coal, nuclear power and gas provide the vast majority of fuel inputs into electricity generation. The proportion of coal used in electricity generation has continued to fall since electricity privatisation in 1989, with a shift towards the cheaper, more efficient and cleaner emissions of combined-cycle gas turbines (CCGT). CCGT generation is expected to double in the next few years (Electricity Association, 1998).

Table 24 – Delivered energy, 1995 (Electricity Association, 1998)

Delivered Energy	Proportion of total delivered energy (%)
Electricity	16
Natural Gas	30
Oil	47
Coal	6

Table 25 – Energy use by sector, 1995 (Electricity Association, 1998)

	Proportion of total delivered energy (%)
Industry	27
Households	25
Commercial and public service	9
Transport	31
Agriculture	1
Other	6

The Dove catchment is a low generator of electricity, there are no power stations located within the catchment.

3.2.7.2 Renewable Energy

The Government's policy is to encourage the exploitation and development of renewable energy where there is the prospect of it being economically attractive and environmentally acceptable. The Agency is keen to support this policy through the application of its powers and duties. The government supports renewable energy schemes through the non-fossil fuel obligation (NFFO).

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 have traditionally been used for power generation, particularly in Scotland and Wales. Others such as wind power are receiving fairly widespread commercial exploitation especially in Wales and the south west of England. Guidance about planning aspects of renewable energy has been published by the DETR in PPG Note 22.

Hydropower is a very traditional means of generating power. Water power fuelled the agricultural revolution of the 17th and 18th centuries and was an important part of the industrial revolution. Many rivers and streams were modified and adapted with mills and mill streams, weirs etc. Many of these structures are no longer used and many have been removed. New schemes requiring the abstraction of water from a river, diversion of flows or impounding requires consent from the Agency. Schemes can affect river flows, impact on other abstractors and can create obstructions to fish migration.

Windpower can have adverse impacts on landscape character and construction works can fragment and disrupt habitats and ecosystems. Wind farms require an Environmental Assessment under Schedule 2 of the Town and Country Planning (Assessment of Environmental Effects) (Amendment) Regulations 1988. There are no windfarms within the Dove catchment.

Energy from waste can also have some adverse environmental effects primarily through the emission of pollutants to air. These are usually controlled by the Agency.

There are no projects in the catchment for major hydropower or wind power developments. However the British Hydropower Association have advised the Agency that there are potential hydropower sites within the catchment.

The use of tyres as a waste-derived fuel is taking place at a site within the catchment, Blue Circle Cement Works, Cauldon. See section 3.2.6.3 for further details.

There are no landfill sites within the Dove catchment where methane is used as a form of power generation as the sites are unsuitable due to engineering constraints.

3.2.8 Heavy Industrial Processes

Industries with the greatest potential to pollute the environment are subject to a system of Integrated Pollution Control (IPC), for which the Agency is responsible, under Part I of the Environmental Protection Act 1990 and regulations made under it. This system requires that certain identified processes must use the best available techniques not entailing excessive cost (BATNEEC) to prevent the release of particular substances into the environment or, where this is not practicable, to minimise their release and render them harmless. The objective behind this approach is to minimise the chances of polluting the environment, taken as a whole, by having regard to the best practicable environmental option (BPEO) for any wastes or discharges arising from the industrial process.

Two lists of processes have been prescribed by regulations for control: Part A processes are controlled under IPC by the Agency; Part B processes are controlled at a local level with regard to their discharges to the atmosphere under a system of Local Authority Air Pollution Control (LAAPC).

Releases to the environment from Part A IPC processes are recorded annually and compiled in an Inventory of Sources and Releases (ISR) and published in the Agency Pollution Inventory.

The careful control of IPC processes is essential in order to minimise the pressures on the environment arising from the quantities of chemicals used, manufactured, and stored at industrial sites. The Agency therefore exercises a leading role in the control of emissions of sulphur dioxide and oxides of nitrogen to the atmosphere for the purposes of the EC Directive on Large Combustion Plants (88/609/EEC). It is also responsible for delivery of the National Plan for the reduction of these substances from old plants.

A large number of substances are subject to specific study and control. Recent attention has been focused on the release of dioxins from incineration plants, particularly in relation to the EC Directive on Hazardous Waste Incineration (91/689/EEC). Dioxins and furans arising from metal refining processes are also being studied.

The principal aim in the regulation of all IPC processes is to minimise the risk of any environmental pollution, at source, by pollution prevention measures. A range of regulatory and enforcement measures are available to the Agency in order to do so. These include enforcement and prohibition notices or prosecution. In the financial year 1997/1998, the Agency was only required to issue 2 enforcement notices in relation to IPC offences in the plan area.

3.2.9 Recreation

When there is a high concentration of people in a relatively small area then their legitimate recreational uses of the environment may create conflicts and pressures both on the environment and also between the respective recreational activities. Potential pressures on the environment include the erosion and compaction of areas used for walking and cycling, damage and disturbance to river banks caused by high levels of angling or wash from boats, and disturbance of wildlife by walking, cycling, boat traffic and angling.

Conflicts can arise between pedestrians, cyclists and anglers on riverbanks and between anglers and boat traffic (including canoeists). Issue 7 in the Dove LEAP discusses the impact of tourism on Dovedale.

3.3 ABSTRACTIONS AND REMOVALS

3.3.1 Minerals

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 is 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 severe local 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 of 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 run-off and reduce 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 and a discharge 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.

3.3.2 Water Abstraction

Water is abstracted for a large number of uses: as a domestic water supply for both consumption and for household use, for agriculture and industry. The Agency under the Water Resources Act 1991 licenses the impoundment and abstraction of water. This has to be done with careful regard to environmental needs. The conditions of abstraction licences are usually framed such that water cannot be abstracted from rivers during drought conditions. Abstractors who need a constant supply of water therefore need some form of storage to retain water in wet periods for later use in dry periods. However, 'licences of right' were issued under the Water Resources Act 1963 to abstractors who had been taking water for 5 years or more before 1963. These licences still exist today and have fewer restrictions on them.

There are a number of exceptions to this general rule, relating to relatively small rates of daily abstraction for domestic and agricultural purposes, the removal of water in relation to land drainage, mining, quarrying, and related activities, and for such uses as fire-fighting. In the plan area there are, at present 383 licences for the impoundment and abstraction of water and 14 gauging stations exist to measure various parameters, including surface water flow and groundwater levels.

The average rate at which water is abstracted varies from year to year. In the UK about half is taken by the water companies and put into public and industrial supply and about a third is used by the electricity supply industry. Only a small proportion - less than 1% - is regularly used for spray irrigation of crops. This agricultural use occurs primarily in the Anglian and Midlands Regions, and most of the demand is concentrated over a relatively short period of some 8 to 12 weeks each year.

The amounts put into public supply have grown steadily in recent years although this trend now appears to be slowing down. Only a very small proportion of this is used as drinking water. Water is also lost via leakage in the overall distribution systems; the estimated quantities lost, and thus their percentage of the total being distributed, varies from one water company to another.

Groundwater contributes to a large percentage of the overall supply of fresh water for public supply in the plan area. An observation well network of boreholes is used to measure, regularly, the levels within major aquifers. The groundwater resource is replenished by rainfall, primarily in the winter months when the amount of water lost from the surface of the ground as a result of evaporation and uptake by plants is at a minimum. Groundwater droughts are therefore caused by relatively dry winters rather than by dry summers, although the latter do, of course, contribute.

In this catchment the levels of groundwater and surface waters are intimately linked. The abstraction of water therefore has to be carefully managed. In cases of severe water shortage, water companies are entitled to impose temporary hosepipe bans. In addition, both ordinary or emergency drought orders can be made by the Secretary of State for the Environment as a result of an application either by the Agency or by a water company. The Agency also has powers to grant drought permits. The difference between drought orders and permits is that whereas both of them generally enable more water resources to be made available to the abstractor, drought orders also give the water companies powers to restrict supplies to their customers. Ordinary drought orders, and drought permits, may initially be made for a period of up to 6 months; emergency drought orders may only be made initially for a period of 3 months.

A considerable quantity of the water abstracted in England and Wales is returned to watercourses and thus re-used. Effluents from water treatment works and industry are therefore essential in some areas to maintain water flows in rivers and canals. In some areas wastewater effluent is used to recharge the underground chalk aquifers.

3.4 USAGE, RELEASES AND DISCHARGES

These include emissions from point sources or cumulative input from known diffuse sources where rate, timing, location or quantities used are important with regard to their environmental impact.

3.4.1 Industrial emissions

The atmosphere is essential to life on earth for many reasons, including the fact that it contains oxygen. It also contains a great number of other natural chemicals. There are however chemicals in the atmosphere as a result of human activities. Some of these may combine in the atmosphere to form other chemicals. Various environmental pressures can then arise, either at a local level, close to the source of emissions or at great distances from the emissions, where the chemicals may finally be deposited.

The Agency is responsible for authorising and regulating emissions to air from the most complex industrial processes, including power stations, refineries, steel and chemicals works, cement and lime production and waste incineration. A National Atmospheric Emissions Inventory is prepared each year for the Department of the Environment, Transport and the Regions (DETR) by the National Environmental Technology Centre (NETCEN).

It is now generally accepted that there is a high risk that some chemical emissions to the atmosphere may have a significant impact on the global environment. Emissions of a range of gases, notably carbon dioxide and methane, are adding to the natural "greenhouse" effect, which may cause global warming. There has been a steady fall in releases from industrial emissions for the plan area, but increasing road transport emissions in recent years has to some extent compensated this reduction. There are other industrial emissions, notably a range of materials known collectively as chlorofluorocarbons (CFCs), that give rise to chemical reactions in the upper atmosphere which deplete the Earth's protective ozone layer, giving rise to increased levels of harmful ultraviolet radiation at the Earth's surface.

In the UK power is mostly generated by the combustion of fossil fuels, coal, oil and natural gas, and from nuclear power sources. Non nuclear processes capable of achieving a rated thermal input of 50 mega watts or more are regulated by the Agency.

The combustion of these fossil fuels release pollutants into the atmosphere. From figures taken from "The United Kingdom National Air Quality Strategy" (DoE, 1997), fossil fuel power stations accounted for 24% of nitrogen dioxide emissions, 15% of particulates and 65% of all sulphur dioxide emissions. Oxides of nitrogen and sulphur dioxide are acidic in nature and can cause environmental and health problems through dry deposition near to their source and contribute to acid rain, often far from their source. England and Wales produce the majority of the total UK emissions, and the greatest proportion of this comes from large combustion plants such as power stations and refineries. Emissions fell to half their 1970 level by 1993 for large combustion plants and the overall trend remains downwards.

A more complex picture emerges for oxides of nitrogen. National emissions increased up to the late 1980s, when they then began to decrease. Large combustion plant emissions are a relatively small proportion of the UK total, the majority arising from road traffic; thus, emissions are more uniformly distributed across the country and arise predominantly from urban areas.

Photochemical pollution is a consequence of the action of sunlight on the mixed emissions of nitrogen oxides, and of volatile organic compounds (VOCs) which are substances released from the use of products containing organic solvents and from road traffic. Ozone is the major photochemical pollutant. It can damage crops and building materials and has significant health impacts, causing respiratory difficulties in sensitive people. Ozone occurs naturally in the atmosphere, and emissions of the man-made precursors of ozone add to this natural background by raising the long-term average levels and by producing episodes during which ozone levels rise to twice the average or more for many hours at a time. Emissions of VOCs increased until the late 1980s, but are now decreasing. Air ozone is also discussed in Section 2.4.2.

Another set of chemicals released into the atmosphere are metals, of which the most important in recent years is lead. Since the introduction of low lead petrol, in 1985 however, the estimated total emissions of lead have markedly decreased.

3.4.2 AMP3 and the National Environment Programme

OFWAT initiated the third 'Periodic Review' of water company price limits in November 1997 for the years 2000 to 2005. These reviews take account new legislation and drivers and will decide the cost of the water bill charges. The Agency plays a major role in this review by providing recommendations on where water company money is spent on environmental improvements. These improvements span water quality and water quantity issues. It is ultimately the Secretary of State for the Environment, Transport and the Regions who decides on the outcome of the Periodic Review.

In the plan area the Agency has put forward many schemes. These involve expenditure to achieve river quality objectives, installing proper flow monitoring on sewage works discharges, meeting the requirements of the Urban Waste Water Treatment Directive, addressing misconnections of sewage into surface water systems and addressing problems of low flows.

The following continuous discharges have been put forward for AMP3 and have been approved:

Ashbourne Sewage Treatment Works – discharging to the Bentley Brook.

Wetton septic tanks – 2 septic tanks to be replaced by a sewage treatment works – discharging to groundwater

Alstonefield Sewage Treatment Works – discharging to groundwater

Biggin Sewage Treatment Works – discharging to groundwater

Cheddleton STW – discharging to R. Churnet

Endon STW – discharging to the Endon Brook

Froghall STW – discharging to R. Churnet

3.4.3 Intermittent and diffuse pollution

This section addresses the pollution loading to the water environment in the Dove area which is not covered by discharge consents.

The principal sources of intermittent discharges are either agricultural or industrial. The causes of agricultural pollution are accidental discharges from silage or slurry stores or from poor management of low rate irrigation of farm wastes. The Agency is responsible for the application of the 1989 Farm Waste Regulations which cover the management of slurry and silage and the storage of fuel. Fuel and chemical spillages are also frequently the source of pollution at industrial sites as well as from road, rail or river transport accidents.

Storm overflows from sewage treatment works or from the sewerage system are necessary to prevent flooding of facilities during heavy rainfall and these therefore operate in such events. While they tend to discharge when rivers are in spate, blockages can cause premature operation of such overflows. These occur in the Dove catchment and are addressed under AMP3.

Diffuse pollutant sources are principally from agriculture or road and other surface run-off. Agricultural run-off can be in the form of fertiliser, suspended solids from ploughing of fallow land, or pesticides. Herbicide application to roadsides or railway lines for weed control can also be a significant source of pollution.

Given the rural nature of the catchment and the agricultural uses of the land and the dependence on groundwater (and in some cases surface water) for water supply, elevated levels of nitrates from fertilisers and pesticides pose a potential threat to such sources.

The development of procedures for pollution control in NVZs is being undertaken by MAFF and the Agency both in terms of monitoring and promotion of appropriate agricultural practice. Nitrate pollution of vulnerable and vital water resources is regarded as a significant issue to be resolved by continued co-operation between the farming community, MAFF and the Agency.

Pesticides levels in surface and groundwater are generally below MAC but elevated levels of herbicides, predominantly Mecoprop, have been detected in the raw water in Tittesworth Reservoir. Issue 1 of Dove LEAP.

Pollution from operational waste sites such as landfills is prevented or addressed through enforcement of the Waste Management Licensing Regulations and the Agency has a duty to amend licences and/or enforce the conditions so as to ensure that there is no pollution of the environment or harm to human health. Pollution can and does result from old waste sites that are no longer subject to a site licence. In such cases the primary responsibility usually rests with the local authority although the Agency will work in close co-operation to remediate the problems.

There are a considerable number of unconsented and frequently poorly maintained septic tank discharges in the rural areas of the Area. These are being addressed by requisition of First time rural sewerage with some schemes being carried out now.

3.4.4 Integrated Pollution Control compliance

The Environmental Protection Act 1990 as amended by the Environment Act 1995 introduced the systems of IPC and Local Authority Air Pollution Control (LAAPC). IPC is concerned with the prevention and control of emissions to all three media of the environment: air, land and water. The industrial processes regulated under this system are Part A prescribed processes, defined in regulations made under EPA 90 and they are the most technically complex and potentially most polluting industrial processes:

- Fuel production, combustion and associated processes
- Metal production and processing
- Mineral industries
- Chemical industry
- Waste disposal and recycling
- other industries (e.g. paper making)

Operation of a prescribed process requires an IPC authorisation and the Agency is responsible for implementing IPC and regulating the most complex industrial processes. Less polluting processes (Part B processes) are authorised and regulated by the Environmental Health departments of local authorities under LAAPC.

The IPC system requires that prescribed processes should use the principle of best available techniques not entailing excessive cost (BATNEEC) to prevent or minimise polluting substance releases and render all substances harmless. Regulators and operators should also have regard to the best practicable environmental option (BPEO) for the releases. The principles of BATNEEC and BPEO ensure that the needs of industrial processes are appropriately balanced with the costs and benefits of environmental protection.

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

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

- Release limits
- Reporting requirements
- Operating conditions
- Improvement programmes

Non-compliance with the conditions of an authorisation can result in enforcement action. In the Dove area there have been two enforcement notices served during 1998/1999. The following table summarises the authorisations by industry sector.

Table 26 - IPC authorisations by industry sector

Industry Sector	No. Authorisations
Fuel and Power production	1
Metal production and processing	1
Minerals (incl. cement)	1
Chemicals	5
Waste disposal and recycling	0
Other	0

Details of IPC authorisations are held on the Public Register at the Agency's area office at Fradley, Lichfield and on Public Registers held by local authorities.

In the document *'An Environmental Strategy for the Millennium and Beyond'* the Agency has a commitment to address climate change and improve air quality. This includes reduction targets for CO₂, SO₂, NO_x, PM₁₀ (particulates), CO, dioxins, lead, non-ferrous metals, VOCs (excluding methane), ozone-depleting substances and other greenhouse gases. These emission reduction targets relate only to processes under the Agency's control and are subject to BATNEEC and BPEO.

Emissions data is collected by the Agency and published through the Inventory of Sources and Releases (ISR). This database is being further developed to enable monitoring of reduction targets. The routine monitoring carried out by the Agency supports, and checks, the monitoring carried out by the operator as a requirement of their authorisations.

3.4.5 Compliance of consented discharges to water

It is an offence - with certain exceptions - to cause or knowingly permit any poisonous, noxious, or polluting matter, or any solid matter, or any trade or sewage effluent, to enter controlled waters in England and Wales. Controlled waters include virtually all freshwaters, groundwater's, tidal and coastal waters to a distance of three nautical miles out to sea from certain fixed baselines on the shore. The principal exceptions are small ponds and reservoirs, which do not supply water to other watercourses - although public water supply reservoirs are included. A defence against this general offence is for a person to possess, and be compliant with the conditions of, a discharge consent issued by the Agency or its predecessor bodies under the Water Resources Act 1991, or one of several other Acts which now or previously provided a specific defence.

Because of various changes in the legislation over many years, a number of different types of discharge consent currently exist. Discharges, which have the greatest potential to affect the quality of the receiving water, have numeric concentration limits attached to their consents. These limits may apply to individual or groups of substances, including limits, which are necessary to ensure compliance with a number of EC Directives, and with commitments made via various international conventions. Approximately 140 numeric consents in the plan area are routinely monitored by the Agency.

Many small discharges to the aquatic environment have a low potential to affect the receiving water adversely and, because of their nature and low volume, would in any case be difficult to control by means of specific numeric values. In these cases descriptive consents are applied which, typically, define the nature of the effluent treatment plant which should be provided, plus a requirement that the plant be correctly operated and adequately maintained. Many non-numeric consented discharges are only authorised to operate under specific weather conditions - for example, under storm conditions. There are currently some 550 discharges, which are controlled without any form of numeric concentration limits applied to them, these are predominantly storm discharges and septic tank discharges.

The conditions applied to numeric consents for large sewage treatment works are somewhat different from those applied to other forms of discharge. This is because the quality of the incoming sewage is not under the direct control of the operator, and the treatment process itself is a biological one, and thus more difficult to control. Such discharges have for many years been controlled by numeric limits which have to be met at least 95% of the time within any 12-month period. Limits are also now being applied to the larger sewage treatment works that should not be exceeded at any time. Virtually all other forms of numeric discharge consents have limits that require 100% compliance.

Assessment of compliance is thus necessarily more complicated for sewage treatment works with numeric consents than for other forms of numerically consented discharges. Some breaches of consent conditions in all forms of discharges are relatively minor, although all such breaches need to be addressed.

The main sewerage undertaker for the plan area is Severn Trent Water Limited (STW Ltd) who are responsible for sewage disposal, there are also numerous private treatment plants serving small developments. STW Ltd operates approximately 36 sewage works of various sizes within the catchment.

The rural areas in the plan have numerous smaller sewage treatment plants, which discharge to rivers and onto land. The demand placed upon these smaller plants is increasing as more people move to rural areas and away from the cities. This can lead to unsatisfactory sewerage systems with the resultant detrimental effects on the nearby watercourses. As development increases in rural areas there are an increasing number of privately owned sewage treatment plants, these are consented in a similar manner to larger volume discharges. The small sewage treatment plants do tend to present discharge quality problems if they are not suitably maintained. People moving into rural developments should ensure they investigate the adequacy of the sewage treatment facilities.

3.4.6 Pesticides

3.4.6.1 Pesticide use

Pesticides are substances used for controlling or destroying pests. There are about 450 pesticide active chemical ingredients currently approved for use in England and Wales by MAFF and by the HSE. By far the greatest users (in terms of quantities) of pesticides are agriculture and horticulture. Their use has revolutionised arable farming in particular; crop yields are now consistently high, and the risks of crop failures are low. Their use, however, can result in environmental damage. The Agency monitors a large number of pesticides in the environment, although only a few have to be monitored on a statutory basis.

Pesticides have a particularly high potential to pollute water, from direct run-off when applied to hard surfaces in weed control practices, from spray drift and from their storage, handling and disposal. Some of the more modern pesticides are less persistent in the environment than many of the older ones. They vary greatly in their chemical and physical characteristics, and thus in their solubility in water. Pesticides are, by their very nature, highly active in that they have a high potential to kill specific organisms. Many of them do degrade rapidly in the environment, but their break down products may also be toxic to some animals and plants.

Although the quantity of organochlorine pesticides used has decreased the area treated has increased. This is mainly because of the use of gamma-hexachlorocyclohexane (lindane) on the expanding area of oilseed rape. Many organochlorine pesticides are now banned and the amounts used continue to decline. Organophosphorus compounds, which initially replaced the organochlorine pesticides, are also now declining in use. Synthetic pyrethroid insecticides are replacing them. Data on pesticides was obtained from the Ecotoxicology and Hazardous Substances National Centre at Wallingford. The top four pesticides used within the plan area are detailed in Table 27 below.

Table 27: Main pesticides used in the plan area during 1997

Pesticide	Year Total (kg)	% of Total
<i>Sulphuric acid</i> : An agricultural dessicant for use on potatoes, linseed and onions. Leachability and degradation properties are not relevant for this substance.	8245.8	16.5
<i>Isoproturon</i> : A residual herbicide for use in cereals. It is used to control blackgrass, wild oats and others in winter barley, winter wheat, spring wheat etc. It is the pesticide most frequently found in inland water due to its widespread use, moderate persistence and leachability.	5885.9	11.8
<i>Chlormequat</i> : A plant growth regulator for reducing stem growth primarily in cereals. It is only slightly persistent and slightly mobile and is not generally monitored for because of these properties.	6069.8	12.2
<i>Mecoprop</i> : This is a herbicide used in cereals and grassland. The use of the active formulation has reduced the load to land however it is very mobile and is therefore monitored within watercourses.	4866.7	9.8

There has been a reduction in the total quantities of pesticide solutions used in recent years. This is in part due to the development of newer, more effective pesticides, which has resulted in much smaller quantities being required to achieve the same effect. Nevertheless, it is not uncommon for six or seven different pesticides to be used prior to harvesting a crop, and the total quantities currently used across England and Wales reflect variations in the production of harvested crops.

Pesticides are also used to improve animal welfare, by controlling parasitic diseases. They are also used to control weed growth on non-agricultural land, such as railway tracks, roads, and pathways. Industrial uses of pesticides include the mothproofing of wool, the fungicide treatment of some cloths, the preservation of timber, and the treatment of the hulls of boats to prevent fouling by marine organisms.

The use of pesticides is covered by comprehensive legislation. Controls over their use are implemented via the Food and Environment Protection Act 1985, and the related Control of Pesticide Regulations 1986 (SI 1986/1510), and the Marketing Authorisations for Veterinary Medicinal Products Regulations 1994 (SI 1994/3142).

Pesticides have also been the subject of controls via the EC Directive on Dangerous Substances (76/464/EEC) and its subsequent "daughter" Directives; these include eight specific pesticides for which Statutory Environmental Quality Standards have been set. These pesticides are: hexachlorocyclohexane (HCH), DDT, pentachlorophenol, aldrin, dieldrin, isodrin, endrin and hexachlorobenzene. Standards for three pesticides - parathion, gamma-HCH (lindane) and dieldrin are also specified in the EC Directive on Surface Water Abstraction (75/440/EEC). In the UK parathion, gamma-HCH, dieldrin and DDT are monitored in relation to the EC Shellfish Waters Directive (79/923/EEC). An even more important limitation is that of 0.1 micrograms per litre for individual pesticides in drinking water (at the tap) imposed by the EC Directive on Drinking Water (80/778/EEC).

The most recent information is contained in Pesticides in the Aquatic Environment, NRA Water Quality Series No 26 (1995). The summary leaflet "Agricultural Pesticides and Water" - HO-9/96-20k-D-AVTT.

3.4.6.2 Pollution from Sheepdip

The threat to the aquatic environment posed by the pesticides used to control sheep ectoparasites, particularly synthetic pyrethroid sheepdips, has developed a high profile since the early 1990's. Very serious pollution incidents have been reported in Wales, Scotland and North West England typically causing severe invertebrate depletion over many kilometres of river. Empirical evidence from SEPA suggests biological fauna may be impacted for 12-18 months following a severe pollution.

In the past many upland areas have been infrequently sampled due to their apparent low risk and the large sampling effort required to adequately monitor the myriad of small tributaries typically present. Prior to the development of synthetic pyrethroid (SP) sheepdips it is probable that many minor pollutions were not observed, or were only apparent as subtle changes at a monitoring site a fair distance downstream. However, since the advent of SP sheepdips the impact of sheepdip related pollutions can be up to 100 times more potent.

Following a sheepdip investigation by Environment Agency Biologist, Phil Wormald in 1998 one confirmed sheepdip pollution was discovered at Onecote on the River Hamps and a second was discovered entering the River Dove from Dowalls Brook. Both incidents caused significant declines in invertebrate abundance and diversity over many kilometres. A large proportion of the Upper Dove catchment has sustained damage to invertebrate populations from these incidents and the five incidents recorded during 1997.

The Agency has worked with the National Association of Agricultural Contractors and the National Sheep Association (NSA - representing sheep farmers) to provide a guide to reducing pollution risks which has been distributed to all members. Sheep sales and markets have been visited by Agency officers to talk to farmers on a one-to-one basis.

New Regulations introduced under the EU Commission's Groundwater Directive in April 1999, will create an offence covering the disposal of sheepdips on land. Farmers must apply and pay for, an Authorisation from the Agency prior to disposal of potential pollutants onto open land. Additionally, the certificate of competence required to purchase organophosphate based sheepdips will be extended to SP sheepdips. The Agency will continue to maintain a careful watch on the situation in the future.

3.5 WASTE ARISING AND DISPOSAL

3.5.1.1 Management of wastes

In the past, Waste Regulation Authorities have produced Waste Management Plans which consider all technical issues relating to waste management and conclude by establishing strategy objectives. The plans were a statutory requirement of Section 50 of the Environment Protection Act 1990 but this requirement was repealed by the Environment Act 1995. Waste Management Plans whether in draft form or having been finalised provide a useful source of information. However, whilst the location of waste management sites can be determined to fall either within or outside a catchment area, the waste arisings statistics contained in the plans are detailed on a district or county basis, they are therefore not able to provide meaningful information in relation to a catchment area.

3.5.1.2 National Waste Production Survey

The Environment Act 1995 placed a duty on the Secretary of State to prepare a National Waste Strategy. In order to help plan the provision of waste disposal recycling and reprocessing facilities in the future and to provide the baseline information for the government's emerging National Waste Strategy, the government asked the Environment Agency to carry out a survey to determine how much waste is produced by industry and commerce throughout the country and how the waste is managed.

The survey was completed during the period October 1998 to March 1999 and involved the Agency or agents acting on behalf of the Agency contacting in excess of 20,000 companies (approximately 200 located within the catchment), representing some 3% of all businesses. Once collated the Agency will be able to produce data for business sectors from which national, regional and local waste production totals can be estimated.

3.5.2 Waste Arisings

An estimated 7 million tonnes of controlled waste is generated in the counties of Derbyshire and Staffordshire, a breakdown of which is shown in the table below.

Table 28 – Waste arisings

County	Household Waste (t/a)	Industrial & Commercial Waste (t/a)	Construction & Demolition Waste (t/a)	Total Controlled Waste (t/a)
Staffordshire	465,000	2,726,000	1,290,000	4,481,000
Derbyshire	500,000	1,240,000	700,000	2,440,000
Totals	965,000	3,966,000	1,990,000	6,921,000

Source: Midlands Environmental Reference Book 1995/96.

3.5.2.1 Household

The term household waste includes waste collected from domestic premises, waste arising at public waste disposal sites and wastes deposited by the public at household waste recycling sites. Household waste arisings have increased by approximately 30% over the last ten years, consumer expenditure has, according to figures released by the DETR, increased by about the same proportion. Indications are that the composition of household waste is changing, the substitution of plastics and card for materials such as glass have led to increased bulk.

The waste type is important because sustainable development depends on positive action by individuals as well as by government or industry. Individuals can reduce waste requiring final disposal both directly, by reusing, recycling and composting, and also by buying long-life, reusable and environmentally friendly products with minimal packaging.

According to the DETR approximately 50% of household waste is potentially recyclable. Around a third of household waste is paper and card of which about half is recyclable, a further 20% is kitchen waste, consisting of organic matter which could be composted. A quarter of glass, metal or plastic, all of which can be recycled. Household and similar wastes collected by local authorities have a relatively high calorific value and are potentially a valuable source of energy. The government has set a target for the recovery of 40% of municipal wastes in England and Wales by 2005.

3.5.2.2 Commercial and Industrial

Industrial and commercial wastes are defined in the Environment Protection Act. Industrial waste is defined as waste from a factory, public transport facility, the supply of gas, water, electricity, sewage services, postal and telecommunication services. Commercial waste is defined as waste from premises used wholly or mainly for the purposes of a trade or business or for the purposes of sport, recreation or entertainment.

Trends in waste arising from industry and commerce are currently uncertain but the composition is likely to be changing as a result of changes in the structure of the industry. Heavy manufacturing industry is in decline, the electronics sector and the tertiary or service industries are expanding. The majority of waste arises in a solid form, with some sludges and a small amount of liquid waste. Most of the waste is disposed of in landfill but a proportion is recovered through land spreading, recycling and scrap metal recycling facilities.

A raft of producer responsibility directives are to be issued, these will require companies to take measures to recover some of the wastes they produce. The directives are designed to ensure that industry assumes an increased share of the responsibility for the waste arising from the use of its products. The Packaging Directive was the first to be introduced. The Producer Responsibility Obligations (Packaging Waste) Regulations 1997 places an obligation on companies satisfying certain criteria to meet target for the recovery and recycling of packaging materials. The next producer responsibility obligation will be placed on waste electrical equipment.

3.5.2.3 Construction and Demolition

These wastes are generated by commercial, industrial and private housing construction projects, quantities arising being dependant upon the levels of activity. Construction and demolition waste is a controlled waste under the EPA and has been designated a priority waste stream by the EC. Information relating to the arisings of these wastes is limited.

The Department of the Environment report 'Managing Demolition & Construction Waste', published in 1994, suggests that construction & demolition waste landfilled comprised of materials such as soil, clay, brick, concrete, bituminous materials, sand & gravel.

According to a report from Howard Humphreys and Partners, 63% of construction and demolition waste is recycled. In practice the majority of this recycled element is roughly broken up for low grade uses, approximately 4% of the waste is subjected to high level processing to meet the standard required for use as primary aggregates. The volume of waste arising from this category is difficult to quantify as considerable amounts of construction and demolition waste are reused on site as fill, in engineering access roads which are exempt from waste management licensing.

3.5.2.4 Sewage Sludge

Sewage sludge wastes arise from sewage treatment works which are operated by Severn Trent Water Ltd in the plan area. Higher levels of wastewater provided for treatment will result in higher volumes of residential sludge. STW's sludge strategy involves increased recycling of sludge for agricultural use and so there is likely to be an increase of sludge spreading on land.

The spreading of sewage sludge as a fertiliser on agricultural land is controlled by the Agency with guidelines issued by MAFF. These controls exist to ensure that the potentially harmful substances in sewage sludge, including pathogens and heavy metals, are at levels that do not cause harm to human and animal health, pollute surface or groundwater, or harm soil fertility and crop yields.

3.5.3 Waste Management Facilities

Waste management facilities include materials recycling facilities, scrapyards, civic amenity sites, waste treatment plants, transfer stations, landfill sites and incinerators. The Agency regulates most waste management facilities through the Waste Management Licensing Regulations 1994 (as amended), which implement the licensing scheme introduced by the Environment Protection Act 1990 and the various EC Directives on Waste.

The waste licensing system aims to ensure that facilities do not cause harm to human health, do not pollute the environment nor cause significant detriment to local amenities. Certain facilities with a low risk potential are exempt from licensing.

There are 32 licensed waste management facilities in the Dove LEAP area, these are shown in table 29.

Table 29 – Waste Management facilities in the Dove catchment

Type	Number
Landfill sites	15
Transfer stations	7
Licensed scrapyards	7
Exempt scrapyards	5
Civic amenity sites	2
Waste treatment plants	1
Oil treatment plants	0
Incinerators	0
In house storage facility	1

3.5.3.1 Landfill

Landfill remains the most significant waste management option in the Dove catchment. The area has 15 licensed landfill sites within its boundary, some of which are not operational. A survey of licensed landfill site returns for 1997/98 shows that just over 2,000 tonnes of controlled waste was disposed of at sites in the area, with approximately 74% of the waste generated in Staffordshire and 22% in Derbyshire.

Table 30 - Landfill sites within the Dove catchment 1997/98

Site Name & Address
3C Waste Ltd, Fowlchurch Landfill Site, Fowlchurch Road, Ball Hay, Leek
The Alcove, Springhill, Oakamoor, Cheadle
Blue Circle Industries plc, Cauldon Works, Cauldon Lowe, Leek
Booths Farm, Clamgoose Lane, Stoke on Trent
Densley Meadows Farm, Draycot in the Clay, Sudbury
Global Environmental, Birchwood Quarry, Ashbourne
Joshua Wardle Ltd, North West of Main Factory, Leekbrook, Leek
Morridge Side, Leek
New Hayden Metals Ltd, Oakhill, Upper Tean
Parkhall Farm, Brookhouses, Cheadle
Poplars Resource Management, Marchington Landfill, Marchington
Tilcon Ltd, Kevin Quarry, Ramshorn, Uttoxeter
Whympenny Farm, Dilhorne, Stoke on Trent

3.5.3.2 Incineration

There are currently no municipal waste incinerators or clinical waste incinerators in the Dove LEAP area.

3.5.4 Recovery

There are a number of small scale composting schemes operational in the Dove area, these turn green waste into compost for use as a soil conditioner.

The Agency is keen to see energy recovery from landfill gas, this will help to ensure that the Government's greenhouse gas emission reduction targets are met. At present there is only one viable landfill sites for energy recovery in the plan area, this is Marchington landfill.

3.6 ILLEGAL PRACTICES

These include accidental events and illegal practices such as pollution incidents.

3.6.1 Pollution incidents

A constant pressure on the aquatic environment is that of the number and severity of pollution incidents. Such incidents have been recorded for many years. Since the creation of the National Rivers Authority (NRA) in 1989, attempts have been made to standardise procedures across England and Wales. The Agency is now responsible for dealing with, and reporting on, aquatic pollution incidents.

In the UK the total number of reported incidents in inland waters has risen more or less continuously, even in recent years. This is considered partly due to an increased public awareness of water quality issues. A freephone number (0800 80 70 60) has been available since 1994 to enable the public to report pollution incidents, the line is manned 24 hours a day all year round.

All pollution incidents have been categorised since 1990 on the basis of their severity.

Category 1 – These incidents are the most serious and may involve one or more of the following:

- Closure of a source of water abstraction
- Extensive fish kill
- Potential or actual persistent effect on water quality or aquatic life
- Major effect on the amenity value of the receiving watercourse
- Subsequent need for extensive remedial measures to be taken

Category 2 – These incidents are significant but less severe, and may:

- Involve the necessity to notify downstream abstractors
- Result in a significant fish kill
- Render water unfit for livestock
- Have a measurable effect on animal life in the water
- Contaminate the bed of the river or canal
- Reduce the amenity value of the water to their owners or to the general public

Category 3 – These incidents are relatively minor and have no significant or lasting effect on the receiving water.

Table 31 - Incidents by source in the Dove Catchment 1997

Industry	Cat 1	Cat 2	Cat 3	Total
Chemical	0	0	0	0
Oil	0	0	0	0
Paper	0	0	7	7
Food	0	0	1	1
Textile	0	0	1	1
Metal	0	1	2	3
Engineering	0	0	0	0
Power Generation / Distribution	0	0	0	0
Landfill / Waste Disposal	0	0	0	0
Waste Transfer	0	1	4	5
Construction	0	0	0	0
Demolition	0	0	1	1
Other	0	0	0	0
TOTAL	0	2	16	18
Mining	Cat 1	Cat 2	Cat 3	Total
Coal	0	0	0	0
Aggregate	0	0	0	0
Clay	0	0	1	1
Quarrying	0	0	0	0
Metal	0	0	0	0
Abandoned Mine	0	0	1	1
Other	0	0	0	0
TOTAL	0	0	2	2
Sewage & Water Related	Cat 1	Cat 2	Cat 3	Total
Sewage Treatment Works	0	1	1	2
Septic Tank Effluent	0	0	1	1
Combined sewer overflow	0	0	4	4
Storm tank	0	0	0	0
Rising main	0	0	0	0
Water treatment works	0	0	0	0
Waste distribution system	0	0	0	0
Surface water outfall	0	0	7	7
Sewage pumping station	0	0	3	3
Foul sewer	0	0	6	6
Other	0	0	0	0
TOTAL	0	1	22	23
Private sewage	Cat 1	Cat 2	Cat 3	Total
Sewage treatment works	0	0	0	0
Septic tank effluent	0	0	3	3
Combined sewer overflow	0	0	0	0
Water treatment works	0	0	0	0
Waste distribution system	0	0	0	0

Surface water outfall	0	0	1	1
Sewage pumping station	0	0	0	0
Foul sewer	0	0	0	0
Other	0	0	0	0
TOTAL	0	0	4	4
Agricultural	Cat 1	Cat 2	Cat 3	Total
Beef cattle	0	0	2	2
Dairy cattle	0	4	22	26
Pigs	0	0	1	1
Poultry	0	0	0	0
Sheep	0	0	2	2
Arable	0	0	2	2
Horticultural	0	0	0	0
Small Holding	0	0	2	2
Stables	0	0	0	0
Fish Farms	0	0	0	0
Mixed	0	0	1	1
Forestry	0	0	0	0
Other	0	0	0	0
TOTAL	0	4	32	36
Transport	Cat 1	Cat 2	Cat 3	Total
Road	1	0	12	13
Rail	0	0	0	0
Ships/boats	0	0	0	0
Airports	0	0	0	0
Pipelines	0	1	0	1
TOTAL	1	1	12	14
TYPE	TOTAL			
Industry	18			
Mining	2			
Sewage (Severn Trent)	23			
Sewage (Private)	4			
Agricultural	36			
Transport	14			

Table 32 - Incidents by Type in the Dove Catchment - 1997

Oils	Cat 1	Cat 2	Cat 3	Total
Petrol	0	0	5	5
Diesel	1	2	10	13
Gas Oil	0	0	2	2
Kerosene	0	0	2	2
Other Fuel	0	0	1	1
Waste	0	0	2	2
Tars / bitumen	0	0	1	1
Vegetable	0	0	0	0
Unknown	0	0	4	4
Other	0	0	1	1
TOTAL	1	2	28	31
Sewage	Cat 1	Cat 2	Cat 3	Total
Treated effluent	0	1	0	1
Septic tank effluent	0	0	5	5
Crude sewage	0	0	10	10
Storm sewage	0	0	4	4
Sewage sludge	0	0	0	0
Sewage debris / litter	0	0	1	1
Other	0	0	0	0
Unknown	0	0	1	1
TOTAL	0	1	24	25
Chemicals	Cat 1	Cat 2	Cat 3	Total
Pesticides	0	0	0	0
Sheep dip	0	0	0	0
Fertiliser – liquid	0	0	0	0
Fertiliser – solid	0	0	0	0
Deicing	0	0	0	0
Acid	0	0	0	0
Alkali	0	0	0	0
Paints / dyes	0	0	0	0
Detergents	0	0	0	0
Solvents	0	0	1	1
Other organics	0	0	0	0
Other inorganics	0	0	1	1
Filter backwash water	0	0	0	0
Chlorinated water	0	0	0	0
Raw water	0	0	0	0
Unknown	0	0	1	1
Other	0	0	1	1
TOTAL	0	0	4	4

Organic wastes	Cat 1	Cat 2	Cat 3	Total
Cattle slurry	0	3	7	10
Pig slurry	0	0	1	1
Other slurry	0	0	1	1
Cattle manure (solid)	0	0	1	1
Pig manure (solid)	0	0	0	0
Poultry manure (solid)	0	0	0	0
Horse manure (solid)	0	0	0	0
Other manure (solid)	0	0	0	0
Animal carcasses	0	0	2	2
Milk	0	0	9	9
Other organic suspended solids	0	0	0	0
Silage liquour	0	0	4	4
Yard washings	0	0	1	1
Dairy/Parlour washings	0	0	3	3
Vegetable washings	0	0	0	0
Other	0	2	2	4
Unknown	0	2	2	4
TOTAL	0	7	33	40
Others	Cat 1	Cat 2	Cat 3	Total
Foam	0	0	1	1
Natural	0	0	9	9
Vehicle washings	0	0	0	0
Rubble / litter	0	0	2	2
Inert suspended solids	0	1	10	11
Colour	0	0	3	3
Tip leachate	0	0	0	0
Urban run-off	0	0	0	0
Other	0	0	1	1
Unknown	0	0	1	1
TOTAL	0	1	27	28
TYPE	TOTAL			
Oil & Fuel	31			
Sewage	25			
Chemical	4			
Organic	40			
Other	28			

3.6.2 Fly Tipping

Flytipping is the term used to describe the illegal disposal of waste at various locations throughout the area. Small scale flytipping may be seen in lay-bys and by road sides, with larger operations being found in some secluded urban areas. The illegal disposal of waste in such sites can cause immediate public concern and, in the worst cases, danger to the public. The Agency has to use its resources effectively and cannot investigate every case of flytipping. A draft operational protocol has been developed with the Local Government Association, which sets out the proposed roles and responsibilities of the Agency and the local authorities. The protocol proposes the primary responsibility for small-scale non-hazardous flytipping should rest with the local authority while larger scale, hazardous flytipping would be dealt with by the Environment Agency.

The introduction of the landfill tax was thought likely to increase the quantity of waste being flytipped. Several studies have been completed, however the results are inconclusive therefore more data must be collected.

3.6.3 Fish Kills

From time to time fish are killed in the plan area due to accidental pollution, in 1997 there were two reported fish kill incidents and three reported incidents in 1998.

3.6.4 Unlicensed waste sites

Once the Agency receives information about such sites they are visited, warned to cease operation and prosecuted if appropriate. Notices can be served on the operators requiring them to remove any waste illegally disposed of at the site. Generally these sites are closed down but they often generate complaints from local residents during the period that they operate. The most serious concerns are often associated with larger-scale illegal sites or sites receiving potentially harmful wastes. In these cases the Agency will prosecute those responsible.

The purpose of producing this Environmental Overview has been for the Agency to assess the current state of the environment for the Dove area. This has helped both to establish an environmental baseline for the Dove catchment and to identify the environmental issues which need to be addressed via the LEAP process. The Dove Consultation Draft, published in May 1999, sets out the key issues identified for the area and gives interested organisations and individuals an opportunity to comment on the actions proposed and raise any further issues that may have been overlooked. Production of the Dove Action Plan in February 2000 will set out prioritised actions and timescales and will give full consideration to the comments raised during the consultation period.

The following is a list of issues contained in the Dove Consultation Draft:

Site specific issues

- Issue 1 Herbicide Contamination at Tittesworth Reservoir
- Issue 2 Flooding along the lower Dove Valley
- Issue 3 Control of activities at John Pointon & Sons Ltd
- Issue 4 Contaminated groundwater at Leek
- Issue 5 Environmental monitoring – Blue Circle Works, Caudon
- Issue 6 Flooding of River Churnet at Leek

Plan wide issues

- Issue 7 Landscape and ecology in the Dove catchment
 - 7.1 Impact of tourism on the landscape and ecological habitats of Dovedale
 - 7.2 Developments within floodplain including development along the A50 corridor
 - 7.3 Changes in agricultural land use
 - 7.4 Loss of habitat diversity in the lower reaches of the Dove catchment
- Issue 8 Reintroduction of salmon to the River Dove
- Issue 9 The genetic integrity of brown trout in the Dove catchment
- Issue 10 Environmental practices at rural industrial estates
- Issue 11 Pollution from sheep dip in the Dove catchment
- Issue 12 Water resource management in the Dove catchment
 - 12.1 Low flows in the Croxden Brook
 - 12.2 Tittesworth Reservoir / Deep Hayes compensation discharge arrangements
 - 12.3 Dove catchment abstraction licensing policy
- Issue 13 Sustainable river bank management

National issues in the plan area

- Issue 14 Water level management plans
- Issue 15 Biodiversity in the Dove catchment
- Issue 16 Water quality objectives, standards and Directives
- Issue 17 Sustainable waste management
- Issue 18 Investment by Severn Trent Water Ltd to improve water quality
- Issue 19 Easter 1998 floods: Lessons learned by the Environment Agency and action to be taken

MANAGEMENT AND CONTACTS:

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

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