

# local environment agency plan

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## WYRE

### CONSULTATION REPORT

APRIL 1997



ENVIRONMENT  
AGENCY



ENVIRONMENT AGENCY

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**NORTH WEST REGION**

Richard Fairclough House  
Knutsford Road  
Warrington WA4 1HG



# CONTENTS

## Foreword

## Section 1

Page No.

1.1	Vision for the Wyre area	3
1.2	The Environment Agency	4
1.3	The LEAP process	5
1.4	Sustainable Development and Biodiversity	6
1.5	The Wyre LEAP Area	7
1.6	Issues and solutions for their resolution	9
1.7	Protection and Partnership	36

## Section 2

2.1	Uses and Resources in the Area	39
2.1.1	Hydrology	39
2.1.2	Fisheries	44
2.1.3	Recreation	48
2.1.4	Landscape and Heritage	49
2.1.5	Ecology	51
2.1.6	Water Abstraction	53
2.1.7	Urban Development	57
2.1.8	Waste Management	61
2.1.9	Area Drainage, Flooding and Flood Alleviation	64
2.1.10	Effluent Disposal	66
2.2	State of the Local Environment	71
2.2.1	Water Quality	71
2.2.2	Air Quality	73

## Appendices

Appendix 1	General Quality Assessment and Statutory Water Quality Objectives	75
Appendix 2	River Ecosystem Classification - Water Quality Criteria	80
Appendix 3	General Quality Assessment (GQA) Chemical Grading for Rivers and Canals	81
Appendix 4	National Water Council (NWC) Classification Scheme Water Quality Classes for Estuaries	82
Appendix 5	Glossary	83

## MAP CONTENTS

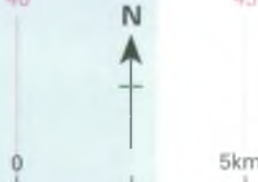
	Map No.
Wyre Infrastructure	1
Water Quality GQA Chemistry	2
Water Quality GQA Biology	3
Flow Measuring and Rainfall Stations	4
Distribution and Density of Adults and Juvenile Salmonids	5
Coarse and Brown Trout River Fishery Distribution and Still Water Fisheries	6
Commercial Fisheries	7
Obstructions to Fish Migrations and Location of Spawning Areas	8
Recreation	9
Landscape, Heritage & Conservation Areas	10
Licensed Abstractions Surface Sources	11
Licensed Abstractions Ground Water Sources	12
Simplified Solid Geology	13
Simplified Superficial Deposits	14
Fylde Aquifer/Schematic Diagram	15
Local Authority Boundaries	16
Landfill Sites	17
Main Rivers and Flood Plains	18
Effluent Disposal	19
State of Catchment Short-Medium Term RQOs	20
State of Catchment Long Term RQOs	21
Designations and Monitoring Points	22

Wyre  
Local Environment Agency  
Plan  
Map 1



ENVIRONMENT AGENCY

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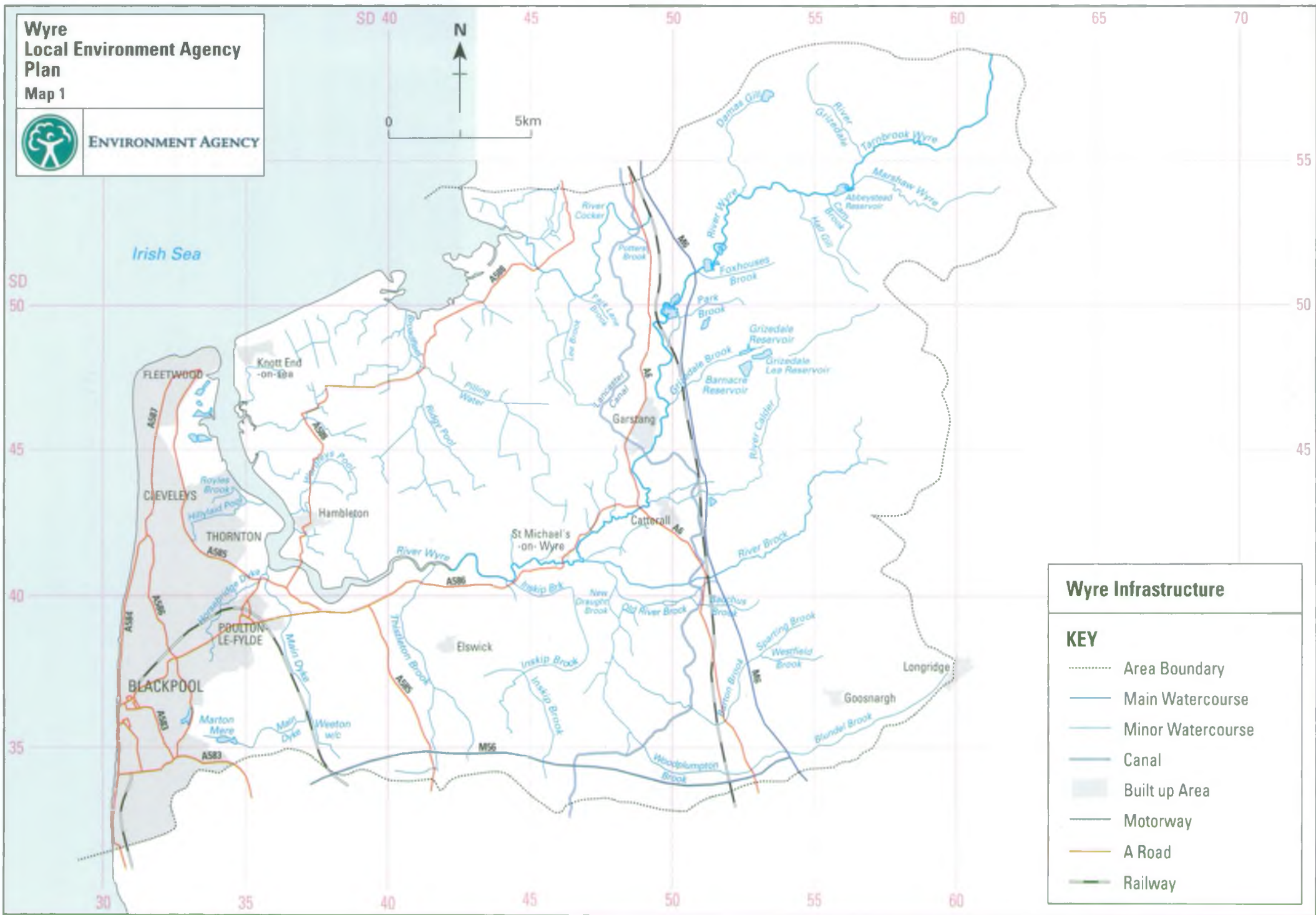
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Irish Sea

Wyre Infrastructure

KEY

- Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Motorway
- A Road
- Railway





## **1.1 VISION FOR THE WYRE AREA**

**The vision for the Wyre area in 25 years is to have:**

An area where activities in the home, in industry, farming and in urban developments are managed to minimise waste production.

An area where there is a sustainable supply of water for abstractors which does not compromise the needs of fauna, flora and amenity and where the quality of the water sustains good salmonid or coarse fisheries.

An area where the risk of flooding to property is minimised and the design of flood alleviation and land drainage works accommodates for and seeks to enhance where possible species, and their habitats, and access to the watercourse for recreational pursuits.

An area where education has raised awareness of the value of ecological features such as wildlife habitats, landscape, archaeological and historic features. Their protection, promotion and enhancement is endorsed by legislation and has been adopted as policy through local development planning process.

The Agency seeks to realise this vision not just through its own actions, but by working in partnership with others.

**Actions carried out over the 5 year life of this plan will contribute to the long term vision in the following ways:**

By achieving improvements to water quality in Rivers Wyre, Calder, Cocker, Inskip and Barton Brooks, Pilling Water and Ridgy Pool. This will ensure that there is a standard in which coarse fish or salmonids (as appropriate) can live and breed. These improvements will be achieved in partnership with the farming community.

By identifying and resolving problems causing failure of Bathing Water Directive Standards at Fleetwood and Blackpool South beaches. This will be achieved in partnership with North West Water Ltd and Local Authorities.

By addressing and resolving fisheries habitats and low flow issues in the rivers, this will result in, at least a doubling of the present adult salmon population.

By ensuring that the flood protection standard of service is maintained to protect the towns people of Garstang and St Michael's. This provides protection for an average one in fifty year storm flood event.

By reducing waste for disposal by 10% through education of the public and industry in partnership with Local Authorities and waste disposal companies in the Wyre area.

By reducing the wastage of water by the public consumer and in industry by 10% of present consumption to safeguard the resources and protect the environment during population growth. This will be achieved by education in respect of water conservation measures, in partnership with Local Authorities and North West Water Ltd.

By ensuring land use planning decisions prevent the loss of ponds, as they are an important ecological feature of the Wyre LEAP area. This will be achieved in partnership with Local Authorities, developers and riparian owners.

## **1.2 THE ENVIRONMENT AGENCY**

The Environment Agency for England and Wales was established on 1 April 1996 as a result of the 1995 Environment Act. It is divided into eight regions and twenty-six areas with head offices in Bristol and London. The Agency provides a more comprehensive approach to the protection and management of the environment by combining the regulation of air, land and water. Its creation is a major and positive step, merging the expertise of Her Majesty's Inspectorate of Pollution, the Waste Regulation Authorities, the National Rivers Authority, and several smaller units from the Department of the Environment.

The Agency exists to provide high quality environmental protection and improvement. This is achieved by an emphasis on prevention, education and vigorous enforcement wherever necessary.

Industry also benefits because it now deals with one regulator instead of three. The Agency seeks to become a 'first step shop' for all business activities.

### **The Environment Agency's statement of vision, values and our key aims**

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

We will:

- protect and improve the environment as a whole by effective regulation, by our own actions and by working with and influencing others.
- operate openly and consult widely.
- value our employees.
- be efficient and businesslike in everything we do.

The aims of the Environment Agency are as follows:

- To achieve significant and continuous improvements in the quality of air, land and water.
- To manage water resources to achieve the correct balance between the needs of the environment and those of abstractors.
- To provide effective defence for people and property against flooding from rivers and the sea.
- To remediate, with others, contaminated land designated as special sites.
- To achieve a significant increase in packaging waste minimisation and recycling through involvement in the producer responsibility scheme.
- To improve and develop fisheries.
- To conserve and enhance inland coastal waters and associated land and their use for recreation and conservation.
- To maintain and improve non marine navigation.
- To achieve all this in a way which does not impose disproportionate costs on society.
- To influence those aspects of the environment for which the Agency is not directly responsible.

### **The Work**

The Agency takes a much wider and more integrated view of environmental regulation than was possible for its predecessors, though remaining an independent, impartial and firm regulator.



## 1.3 THE LEAP PROCESS

### Key Stages:

(i) The Consultation Report

The report proposes a vision for the Wyre area. Section 1 identifies the issues and options for their resolution and Section 2 provides supporting text to provide longer term reference.

(ii) Consultation Period

An informal pre-consultation took place at the start of the process in July 1996. This provided an opportunity for interested parties within the area to raise concerns and identify issues. This generated over 50 written responses which have been considered through the plan's production.

The formal consultation will extend over three months following the public launch and the responses will provide an indication to the Agency that the major issues have been correctly identified.

(iii) Translation of the document into Action Plan

In order to produce the action plan, the issues will have to be confirmed with the responsible lead organisation in terms of timescales and allocation of budgets.

In some cases solutions are not always possible within the 5 year plan. In these circumstances the issues are defined as 'future'.

(iv) Future Review and Monitoring

Progress will be monitored and reported on annually, by means of a review document which will be publicly available. The review document will comprise the following information:

A detailed comparison of planned progress against actual.

Identification of additional actions to maintain progress in the light of changes.

(v) Scope of the Plan

The issues raised within this plan reflect areas over which the Agency has regulatory control or where it can work in partnership with other organisations to promote environmental improvements.

Where the statutory or primary responsibility is with another organisation e.g. Local Authority this will be referenced either in the issues, text or through the partnership section.

## **1.4 SUSTAINABLE DEVELOPMENT AND BIODIVERSITY**

### **Sustainable Development**

The Agency's overall aim of protecting and enhancing the environment contributes to the Government's and the world wide environmental goal of sustainable development which is defined as:-

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". (Brundtland Definition - Earth Summit, Rio 1992). This is carried through the Agency's vision statement and requires economic and social activities in England and Wales to be undertaken within the carrying capacity of the environment.

The economy, society and the environment are linked and all form part of a dynamic system that is in constant change. Action, regulation, education and enforcement all have a part to play in working towards sustainable development by the Agency and others.

Integrated environment management is a means by which the Agency can promote sustainable development and LEAPs are an important part of this process.

### **Biodiversity**

Biodiversity is simply a new term meaning the "variety of life".

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

## 1.5 THE WYRE LEAP AREA

The area defined as the Wyre for the purposes of this plan is shown on map 1. The area is based on the Wyre surface water catchment and as such extends beyond the remit of Wyre Borough Council incorporating parts of other Local Authority areas. The general infrastructure is shown, this map has been adapted throughout the document to highlight the various uses and activities carried out within the Wyre area.

Many of the issues make reference to improvements in water quality. The next section provides an overview of the catchment in water quality terms.

### General Quality Assessment (GQA)

Every five years a national survey is carried out of the quality of rivers, canals and tidal waters in England and Wales. Key stretches (i.e. stretches receiving significant discharges or stretches of significant flow) are monitored at strategic sampling points. The last national survey was in 1995.

#### Rivers and Canals

A comparison of 1990 GQA classes (based on chemical data for the period 1988 to 1990) with 1995 GQA classes (based on chemical data for the period 1993 to 1995 and biological data for 1995) for the rivers and canals in the Wyre Area is shown below (water quality criteria for GQA classes are given in Appendix 3):

GQA Class	km	km	%	%
Chemical	1990	1995	1990	1995
A Good	28.0	0.0	17.3	0.0
B Good	18.8	50.4	11.6	26.1
C Fair	14.9	27.5	9.3	14.3
D Fair	16.3	54.1	10.1	28.0
E Poor	54.6	50.3	33.8	26.1
F Bad	28.9	10.6	17.9	5.5
Total	161.5	192.9	100.0	100.0

This table highlights the improvements that have been secured in water quality over the last 5 years with over 50 % of the classified watercourses being classified as having either poor or bad water quality in 1990 compared to 32 % in 1995. The loss of 28.0 km of class A water quality is due to a marginal deterioration in water quality of the upper reach of the River Wyre. It should be noted that since 1990, due to increased monitoring, the total length of classified water in the catchment has increased.

GQA Class	km	%
Biological	1995	1995
a Excellent	0.0	0.0
b Good	76.5	46.3
c Fair	32.6	19.8
d Moderate	32.1	19.4
e Poor	20.9	12.7
f Bad	3.0	1.8
Total	165.1	100.0

Only limited biological data is available for 1990. Biological monitoring presently indicates a larger percentage of good quality watercourses and less poor or bad quality watercourses than indicated by chemical monitoring. The total length of watercourse classified biologically is lower than the total length classified chemically because the Lancaster Canal is not biologically classified.

**Wyre  
Local Environment Agency  
Plan  
Map 2**



ENVIRONMENT AGENCY

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Irish Sea

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**Water Quality Overview-  
GQA Chemistry (1993-1995)**

**KEY**

..... Area Boundary

— Canal

■ Built up Area

Rivers

Canals

— A } Good

— B } Good

— C } Fair

— D } Fair

— E } Poor

— F } Bad

— Unclassified

— Reach Boundary







**Wyre  
Local Environment Agency  
Plan  
Map 3**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



5km

SD  
50

Irish Sea

45

FLEETWOOD

Knott End  
-on-Sea

CLEVELEYS

Royles Brook  
Holliday Pool

THORNTON

Horwath's Dyke

BLACKPOOL

Marion Mere

POULTON-  
LE-FYLDE

Martin Dyke

Wootton  
with

Hambleton

Moulley's Pool

River Wyre

Thurston Brook

Inskip Brook

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**Water Quality Overview-  
GOA Biology (1995)**

**KEY**

- ..... Area Boundary
- Canal (Unclassified)
- Built up Area
- Rivers
- A } Good
- B } Good
- C } Fair
- D } Fair
- E } Poor
- F } Bad
- Unclassified
- Reach Boundary

SD  
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Maps 2 and 3 show the GQA 1995 chemical and biological classes for the rivers and canals in the Wyre Area. The better quality watercourses are predominantly found in the upper parts of the Area with the poorer quality watercourses generally located in the more populated and intensely farmed parts of the Area, e.g. the tributaries of the Wyre Estuary situated on the Fylde plain.

### Wyre Estuary

The 1995 classification of the Wyre Estuary is shown below. Water quality criteria for the NWC classes are also given in Appendix 4:

<b>Watercourse</b>	<b>Reach</b>	<b>NWC Class 1995</b>
Wyre Estuary	Fleetwood to Wyre Light	A
Wyre Estuary	White Hall to Fleetwood	B

These classes have remained unchanged since the 1990 survey.



## 1.6 ISSUES AND SOLUTIONS FOR THEIR RESOLUTION

The issues describe some of the challenges which lie ahead. We are seeking your views on how we and others should deal with the identified issues.

The issues will form the hub of the action plan which will be produced following consultation period. Consequently we should ask you to look carefully at these issues and address your main comments to this section of the plan.

**Have all the issues been identified?**

**Which option is likely to provide the best outcome?**

**The consultation period extends until 30 June 1997.**

### List of Abbreviations used in tables

The Agency	-	Environment Agency
LA	-	Local Authority
RO	-	Riparian Owner
MAFF	-	Ministry of Agriculture, Fisheries and Food
NWW	-	North West Water Ltd
RSPB	-	Royal Society for the Protection of Birds
BW	-	British Waterways
BCU	-	British Canoeing Union
NFU	-	National Farmers Union
ADAS	-	Agricultural Development Advisory Service
EN	-	English Nature
WDA	-	Waste Disposal Authority
CLA	-	Country Landowners Association
FWAG	-	Farming Wildlife Advisory Group
LWT	-	Lancashire Wildlife Trust
CC	-	Countryside Commission

NB: Organisations listed within the responsibility column are not shown in any order of priority.

**Issue 1: Loss of Fylde pond habitat due to infilling and development.**

Ponds and the associated pondscape resulting from earlier digging works are a characteristic element of the lowland Wyre, and are of landscape and heritage value, in addition to their habitat and associated species resource. The wildlife value of a pond is considerably increased if it is part of a network of ponds linked by wildlife corridors such as hedges and ditches. This network of ponds is under continual threat from development, changes in agricultural practice, infilling, and poor management or total neglect and has suffered a 40% decline in the last 50 years. Fragmentation of the network needs to be addressed by viewing ponds as part of a wider pondscape, and developing a strategic approach to their protection.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
1. Assess the existing pond and pondscape resource - identifying key sites for protection; degraded sites for enhancement; and opportunities for pond creation. Encourage the continued development of the database 'Pond Information Network' in the Wyre area.	Pond Life Project Community Pond Warden Scheme. FWAG ADAS The Agency Local Authority	Provides a baseline on which to base future decisions that target key sites.	1997-2002
2. Encourage the promotion of ponds and pondscape, through publicity and education.	FWAG NFU CLA ADAS The Agency	Increase awareness of the value of ponds, thus influencing attitudes.	1997-2002

**Constraints:** Pressure from third parties to develop such areas.

**Locations:** All the areas identified for development in the development plans for Fylde Borough Council, Preston Borough Council, Blackpool Borough Council, Lancaster City Council and Wyre Borough Council. In particular the areas south of the Wyre and around the urban areas of Blackpool, Poulton and Thornton.

**Issue 2: The protection and restoration of existing and degraded important habitat types and their associated species, to protect and increase biodiversity.**

An English Nature survey in 1993 identified a decline in lowland wet grassland around St. Michael's, Pilling and Cockerham Mosses. This habitat is important for waders and wildfowl. The Agency will work with key partners to recreate and restore these areas.

Peatland areas around Pilling, Winmarleigh, Rawcliffe, St Michael's Inskip, Elswick and Wesham are being cut and drained (2.5m of peat lost at Eagland Hill, Pilling). A North West Wetland Survey has shown that these areas provide archaeological finds such as the severed head found at Pilling. Maintenance of the peatland is important not only as a habitat, but also to preserve the archaeological remains within them.

Water voles are a short-list on the biodiversity action plan. Water voles are present in the Wyre, but suitable habitat is limited and promotion is necessary to ensure its survival. The area identified for study is the area to the west of the M6.

The Environment Agency is working in partnership with Local Authorities, Wildlife Trusts, English Nature and Societies to address this.

There is a shortage of suitable spawning substrate in the Wyre area for salmonid and coarse fish. The Agency is seeking to rectify this by forming work parties to undertake cleaning of existing gravels in collaboration with angling clubs. Where gravels are absent, gravel replenishment work will be carried out. This action is necessary to promote an increase in the distribution and density of fish populations in the Wyre area.

The creation of riparian buffer strips along certain rivers and streams may act to reduce diffuse pollution and land run-off. They would also increase the diversity and distribution of habitat for fish and other wildlife by providing extra cover and food.

The fencing off river banks would also reduce damage through over-grazing. This is a serious problem on the Wyre downstream of Churchtown and on the River Brock. Banks would become more stable thereby reducing erosion and siltation which should enhance flood defence management and maintain existing defence standards.

Lancashire has one of the lowest levels of woodland cover in the country. Within the Wyre catchment linear broad leaved woodlands associated with the rivers are the most noticeable. The Wyre Tree Strategy highlights the sparsity of tree cover in particular the lower reaches of the Wyre downstream from Garstang. Riparian owners will be encouraged to create and plant up buffer strips through grants available through the Countryside Stewardship Scheme, although this may conflict with access requirements to the watercourses for Flood Defence purposes and recreational users and in addition risk current flood defence standards of protection. The upper reaches of the catchment have suffered from poor woodland management and excessive grazing pressure from livestock resulting in the degradation of some areas of Ancient Woodland (that is, woodland that has existed since at least 1600AD).

PREFERRED SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
<p>1. Lowland Wet Grassland and Peatland. Use the EN 1993 report and Wetland Survey to identify key locations where existing lowland wet peat and grassland can be protected; and locations where lost habitat can be recreated and restored.</p>	<p>RSPB EN The Agency ADAS</p>	<p>Assess the existing resource and pinpoint areas for action.  Protect archaeological remains by preventing peat desiccation.</p>	<p>1997-2002</p>
<p>2. Water Voles. Support the LWT North West Water Vole Survey in locating key sites for water vole populations.  Produce and implement a water vole habitat management plan and support habitat creation initiatives.</p>	<p>LWT The Agency</p>	<p>Fully supported structured approach to the protection/restoration of wildlife habitat and species.</p>	<p>1997-2002</p>
<p>3. Manual cleaning of existing gravels. Further seeding of suitable gravels and transference of gravels from above Abbeystead Reservoir.</p>	<p>RSPB EN LWT RO The Agency Angling Clubs</p>	<p>Maximise use of natural spawning gravels and create additional spawning beds where required.</p>	<p>1997-1999</p>
<p>4. Removal of accumulated silt in areas of high deposition by either extraction or modification of channel engineering.</p>	<p>The Agency</p>	<p>To improve facilities for angling and create diversity of habitat.</p>	<p>1997-1998</p>
<p>5. Use Wyre Tree Strategy as a catalyst to encourage riparian owners to undertake set aside buffer strips increasing bankside vegetation.</p>	<p>The Agency RO FWAG ADAS</p>	<p>Raise tree planting profile. Improve visual, wildlife and fisheries value. Control bank erosion and improve water quality.</p>	<p>1997-2002</p>
<p>6. Revegetation of river channels to reduce erosion and silt deposition.</p>	<p>The Agency RO FWAG ADAS</p>	<p>Creates diversity of habitat, improves fisheries, reduces erosion, improves flood defences and water quality</p>	<p>1997</p>
<p>7. Promote efficient use of water in agriculture by encouraging winter storage and efficient irrigation techniques.</p>	<p>Farmers MAFF NFU ADAS The Agency</p>	<p>Reduced demand, increased availability for others and for the environment.</p>	<p>1997</p>

**Constraints:** NNW/RO/BW/LA/Angling Clubs/EN co-operation. Incentive compensation schemes required  
Flood Defence standards to be maintained.

**Issue 3: Impact of barriers restricting the distribution of fish in the Wyre area.**

Several barriers, either full or partial, to fish migration have been identified including: Churchtown Weir, Dolphinholme Weir, Street Bridge Weir, the Aqueduct Weir on the River Brock and Lee Bridge Weir at the foot of Tambrook Wyre with some smaller obstructions created by bedrock falls. In addition, the modification of bridge culverts and the selective removal of fallen trees should ease the passage of fish. The fish pass at Churchtown Weir is currently inefficient and needs to be improved. Additional sites identified but not actioned in this plan include: Foxhouses Brook, Grizedale Dam and Cam Brook Force. (See map - Obstruction to Fish Migration Section 2.1.2)

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
1. Alter Churchtown Weir fish pass.	The Agency LA	Maximise area of natural spawning grounds.	1998-1999
Improve Street Bridge Weir. Selective removal of fallen trees.	The Agency LA RO Angling Clubs		1997-1998
Modify road bridge culverts to ease the passage of fish.	The Agency		1997-1998
Install a fish pass on the River Brock Weir. Several smaller obstructions.	BW RO Angling Clubs		1998-1999
2. Investigate improvements to modify major weirs to allow constant flow at Calder and Barnacre Intake.	NWW The Agency	Allow fish migration and improves water quality downstream.	1997-1999
3. Restore the fish stocks in tributaries following future water quality improvements.	The Agency Angling Clubs		1997-2002

**Constraints:** Co-operation and assistance of Riparian Owners/BW/LA/Angling Clubs.  
Success of any stocking operation.  
Flood Defence interests.

**Issue 4: Poor access to the watercourse and coast for recreational use.**

There is a lack of footpaths in some areas of the catchment, particularly in the areas between Little Singleton and Little Eccleston, between Great Eccleston and St. Michael's and at Gubberford Lane in Scorton. In addition to which the Coastal Path is being pushed inland at Pilling. Some existing footpaths, between Skippool Bridge and Little Singleton and between Hambleton and Out Rawcliffe become waterlogged and others are littered by the effect of the tide. This has been raised not only by recreational users but also by Lancashire County Council who have expressed their concern at the general lack of good quality open space amenity especially within urban areas. The Agency does not own the majority of flood banking but has agreements with local landowners for flood bank protection and maintenance. The Agency, in collaboration with Local Authorities and landowners, will seek to improve and promote current facilities and act as honest broker in discussions to extend access for walking and cycling.

The recreational use of the river corridor occasionally gives rise to a conflict of interest between different types of users, for example motor boats in the Estuary can disturb people interested in bird-watching. In these instances, the Agency will attempt to resolve conflict by education and liaison with the users of the recreational resource for diverse recreational purposes.

Canoeists have identified a lack of parking and access to the river for canoeing in some areas for example in Garstang. Canoeing does occur from Garstang to Fleetwood on an ad hoc basis. The Agency will seek to promote access for a canoe trail in this area with landowners and other recreational users during suitable river flows and times of the year.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
1. Identify areas where existing footpaths can be extended and where new paths can be created.	The Agency Owners LA	Increase access to the amenity in line with the Agency's Recreation Strategy.	1998-1999
2. Identify areas where canoe access to the river can be improved and facilitate negotiations for the use of the river for canoeing in suitable areas and periods.	The Agency BCU Owners Angling Clubs LA	Increase the recreation use of the resource.	1997-1999

**Constraints:** Co-operation of LA, Owners, BCU, Conservationists and Anglers.  
Resolving conflicting interests.

**Issue 5: Artificially induced low flow conditions within the catchment.**

Historical rights for the abstraction of water from the Wyre catchment results in artificial low flows. Detrimental effects have been identified in fauna and flora within 27kms of the Rivers Wyre and Calder (12kms affected by surface water abstractions/15kms due to groundwater abstractions). These historic rights are enjoyed by North West Water Ltd (NWW) for public water supply and by British Waterways (BW) for maintaining water levels within the Lancaster Canal. The Agency is working with NWW and BW to identify solutions and policies to reduce or remove the detrimental effects of these abstractions.

During the pre-consultation exercise carried out in July 1996, public concern was expressed regarding the environmental effects of both surface water and groundwater abstractions. In particular in Tarnbrook Wyre, Grizedale Brook and River Calder but also over other extensive reaches over the Fylde aquifer. This was also confirmed in the results issued in the APEM Report detailing a study of the Fylde prepared for the Agency in 1996.

The Agency has recently conducted a Fylde Aquifer/Wyre catchment study which highlighted a number of issues regarding the hydrology and hydrogeology of the Fylde Aquifer. Observations included declining groundwater levels, loss of river flows over extensive reaches of most watercourses and losses/deterioration in wetland features. Based upon the study a number of recommendations have been made which have been incorporated into the solutions.



PREFERRED SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
1. Evaluate effect of licenced abstraction conditions from <b>surface water</b> sources: Tarnbrook Wyre Grizedale Brook River Calder	The Agency NWW BW	Improved flow conditions which will benefit water quality.	1997-1998
2. Construction of drift observation boreholes adjacent to: NWW source L Winmarleigh Moss SSSI.	The Agency NWW English Nature Industry	Optimise water resources use on the Fylde Aquifer (Groundwater and Surface water).	1997-1999
3. Install a permanent gauging station on Woodplumpton Brook.	The Agency	Assess options for alleviations of low flows.	1997-1999
4. Review of the current status and reliability of continuous recording flow measuring stations, particularly with regard to low flows.	The Agency	Develop strategy for future groundwater management policy.	1997-1999
5. Evaluate effects of licenced abstraction and augmentation conditions from <b>groundwater</b> sources on the following: River Wyre River Brock Barton Brook Woodplumpton Brook	The Agency NWW	To reduce over-abstractions of the Groundwater sources in the Fylde aquifer. Increase groundwater levels to prolong baseflows in surface waters and protect wetlands.	1997 - 2002
6. Enhance environmental monitoring (Apem report)	The Agency EN		1997-2002

**Constraints:** Co-operation of NWW and BW  
AMP3 requirement and timescales.

## **Issue 6: Failure to meet Freshwater Fisheries Directive standards**

Several watercourses within the Wyre LEAP Area are designated as salmonid fisheries under the Freshwater Fisheries Directive (EEC/78/659). (See also Issues 2 and 3).

The stretches listed below presently fail to comply with strict limits on water quality, in particular the concentration limits for ammonia. The causes of these high levels of ammonia are believed to originate primarily from agricultural practices. Slurry and silage liquor discharges occur from farms with inadequate containment facilities. The spreading of slurry to land is also a significant contributor but is difficult to control due to the widespread nature of spreading activities. Other potential inputs of ammonia are discharges of treated sewage effluent from NWW WwTWs, and discharges from smaller private sewage treatment works and septic tanks.

Visits to farms by Agency staff are continuing. The visits provide an opportunity to advise and educate farmers on best farming practices. Advice is given about improvements that may be needed to contain farm wastes, and how pollution can be avoided when spreading wastes to land. Irrigation advice is also available to reduce water usage.

### **Failures to meet objectives:**

- i) Failure to meet the Freshwater Fisheries Directive standards for a salmonid fishery in Barton Brook upstream of Barton WwTW, Westfield Brook and Sparring Brook due to ammonia. Agricultural inputs are thought to be the cause of these failures.
- ii) Failure to meet the Freshwater Fisheries Directive standards for a salmonid fishery in Barton Brook downstream of Barton WwTW due to ammonia. Agricultural inputs plus the additional discharges from Barton WwTW are thought to be the cause of these failures.
- iii) Failure to meet the Freshwater Fisheries Directive standards for a salmonid fishery in New Draught Brook due to ammonia. In addition to the inputs identified in i) and ii) above agricultural inputs and septic tank discharges to Woodplumpton Brook are thought to be the cause of this failure.
- iv) Failure to meet the Freshwater Fisheries Directive standards for a salmonid fishery in the Little Calder River due to ammonia. Agricultural inputs are thought to be the cause of this failure.
- v) Failure to meet the Freshwater Fisheries Directive standards for a salmonid fishery in the River Calder due to ammonia. Agricultural inputs plus the additional discharges from Calder Vale WwTW are thought to be the cause of these failures.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Provide information/advice to agricultural community on pollution prevention, efficient spraying/spreading techniques.	MAFF ADAS The Agency	Reduce pollution of watercourse and reduce demand for and use of water.	1997-2002
Carry out intensive water quality and ecological monitoring to identify and quantify inputs to the various stretches.	The Agency	Sources identified enabling prioritisation of remedial works.	1997
Carry out farm pollution control campaigns to identify and rectify point sources of farm pollution.	The Agency Farmers	Improve water quality, compliance with Fisheries Directive and achievement of long term water quality objectives.	1997
Carry out surveys of habitat and present fisheries status.	The Agency	Better understanding of present conditions.	1997
Review designation of fisheries under Fisheries Directive, propose changes where necessary.	The Agency	Designations under the Fisheries Directive will reflect true potential of the fishery.	1997
Provision of additional treatment at Barton WwTW/revision of consent standards (if necessary).	NWW The Agency	Improve water quality, compliance with Fisheries Directive and achievement of long term water quality objectives.	2000+

**Constraints:** Costs to farmers/NWW.  
DoE policy on designation of fisheries under Freshwater Fisheries Directive.

**Issue 7 Impact of discharges from North West Water (NWW) Ltd Wastewater Treatment Works.**

**Broad Fleet-Pilling WwTW**

**Failures to meet objectives:**

Significant failure to meet the long term objective of RE4 in Broadfleet for BOD, ammonia and dissolved oxygen. Flows into Pilling WwTW presently only receive primary treatment and are locked in Broadfleet at certain states of the tide.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Install additional treatment at Pilling WwTW. Relocation of point of discharge to downstream of tidal gates.	NWW	Improved water quality. Achievement of water quality objectives for Broadfleet. Compliance with Urban Waste Water Directive.	by 2005

**Constraints:** Costs to NWW/work scheduled for completion no later than end of year 2005 in AMP2 programme in line with UWWTD.

**Wyre Estuary-Hambleton WwTW**

Flows into Hambleton WwTW presently only receive primary treatment and are discharged into the high amenity watercourse Wardleys Creek before entering the Wyre Estuary. The poor quality of the effluent and the poor location of the outfall results in bad smells and sewage derived litter associated with the discharge impinging on boat users in the area.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Abandonment of Hambleton WwTW and transfer of flows to Fleetwood WwTW for treatment (preferred solution).	NWW	Improved water quality in Wyre Estuary. Elimination of poor aesthetics in vicinity of present discharge.	by 2005
Provision of secondary treatment at present site.	NWW		by 2005

**Constraints:** Costs to NWW/work scheduled for completion no later than year 2005 in AMP2 programme in line with UWWTD.

## **Issue 8: Impact of discharges from combined sewer overflows.**

Combined sewers are used to convey both foul drainage and uncontaminated surface waters (rain falling on roofs and hard standing areas) to wastewater treatment works. Combined sewer overflows (CSOs) are located on sewers or at pumping stations and discharge to local watercourses. They are designed to prevent foul flooding by relieving the sewerage network of excess flows during storm conditions. When properly designed and constructed they should only operate at times when there is adequate dilution available in the receiving watercourse.

Historically sewerage systems were of the combined type. Problems now exist due to the increase in residential and commercial development resulting in inadequate sewer capacity and the frequent operation of storm overflows, many of which have inadequate solids retention capability in 'non-storm' conditions, with consequent deteriorations in water quality and adverse impact on river aesthetics.

Within certain parts of the Wyre, sewerage systems have been assessed both for structural integrity and impact on water quality and Drainage Area Plans (DAPs) have been drawn up.

Over the past couple of years significant improvements have been made along the Fylde Coast with a number of unsatisfactory overflows being either abandoned or significantly improved. However, there are still around 20 inland unsatisfactory CSOs within the Wyre Area requiring improvement and these have been highlighted to North West Water (NWW) Ltd. An agreed programme of work is to be undertaken as part of the Asset Management Plan (AMP2) process. NWW plan to improve or abandon a further 13 of these unsatisfactory overflows by the year 2005. There is no planned action proposed for the remainder until beyond 2005. These will be considered for inclusion in AMP3.

### **Failures to meet objectives:**

- i) Significant failure to meet the long term objective of RE4 in Royles Brook due to BOD, ammonia and dissolved oxygen.

One unsatisfactory CSO discharges to Royles Brook. There are no plans to address this overflow before the year 2005 (see also issue 9).

### **Location of other unsatisfactory combined sewer overflows (UCSOs):**

Due to the intermittent nature of storm overflow discharges, impacts on receiving waters are not always picked up by routine chemical sampling. In addition many CSOs discharge to minor watercourses which are not routinely monitored by the Agency. The other identified unsatisfactory CSOs within the Wyre LEAP Area are described below:

- i) 10 overflows can potentially discharge via a culverted section of Main Dyke to Marton Mere. Agency staff are presently involved in discussions with NWW Ltd regarding these overflows. NWW Ltd plan to address 3 identified unsatisfactory overflows in the period 1997-1998.
- ii) 3 UCSOs discharge to the Old Field Carr culvert at Hardhorn. NWW plan to address these within the period 2000-2005.
- iii) 3 UCSOs discharge to Main Dyke. NWW plan to address these within the period 2000-2005.
- iv) 3 UCSOs discharge to the River Wyre.
- v) 4 UCSOs discharge to Horsebridge Dyke. NWW plan to address these within the period 2000-2005.
- vi) 1 UCSO discharges to Smith Pool, Garstang.
- vii) 1 UCSO discharges to the sea at Preesall.

viii) 1 UCSO discharges to an unnamed ditch at Hambleton.

ix) 1 UCSO discharges to an unnamed drain from Ribblesdale Drive Pumping Station, Forton.

PREFERRED SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Ensure resolution of unsatisfactory CSOs within present AMP2 programme.	NWW	Reduction in the number of unsatisfactory CSOs by capital works. Improved water quality. Improved aesthetic quality.	1997-2005 Priority order for 2000+ yet to be determined.
Review designations for remaining CSOs and prioritise problems to be resolved.	The Agency NWW	Aid decision making.	1997-1998
Pursue further improvements to sewerage network to resolve problem of remaining unsatisfactory CSOs.	The Agency NWW	Further reduction in the number of CSOs, or improved performance of existing CSOs. Improved water quality. Contribute to achievement of water quality objectives. Improved aesthetic quality.	2000+

**Constraints:** Costs to NWW/Resolution of all problems not scheduled in AMP2.

**Issue 9 Impact of contaminated surface water discharges from separate sewerage systems**

Modern developments have separate sewerage systems for dealing with uncontaminated surface water run-off and foul sewage. Clean water is piped and discharged to a local watercourse and the foul sewage is conveyed to a Wastewater Treatment Works. The advantages of this network compared to the traditional combined sewerage system are the elimination of the need for storm sewage overflows and the reduced treatment costs due to the smaller volumes treated.

However, problems arise where foul water is incorrectly plumbed to the surface water system (e.g. from household washing machines) or where contaminated liquids are poured down surface water drains instead of drains connected to the foul sewer. This leads to Contaminated Surface Water (CSW) or "Wrong Connection" problems. The Agency in conjunction with North West Water Ltd and the local authorities carry out site inspections to identify CSW problems.

A list of contaminated surface water discharges from NWW surface water outfalls was produced by the former NRA and forwarded to NWW for rectification. These CSWs were investigated over a three year period, ending in March 1995, during which time NWW sought to eliminate these sources of pollution. Although the three year project has now finished, a number of CSWs originally identified are not totally resolved and some wrong connections do still exist. These are being followed up by Local Authority Environmental Health Departments.

In addition to the above, a number of new CSWs have recently been identified in the Wyre Area and these will be the subject of preliminary investigations on an individual basis by NWW. Following these investigations an agreed timescale will be sought between the Agency and NWW for improving these CSWs.

**Failure to meet objectives due to CSWs discharging to classified watercourses:**

- i) Significant failure to meet the long term objectives of RE4 in Hillylaid Pool and Royles Brook. Around 12 contaminated surface water outfalls discharge to these two watercourses.

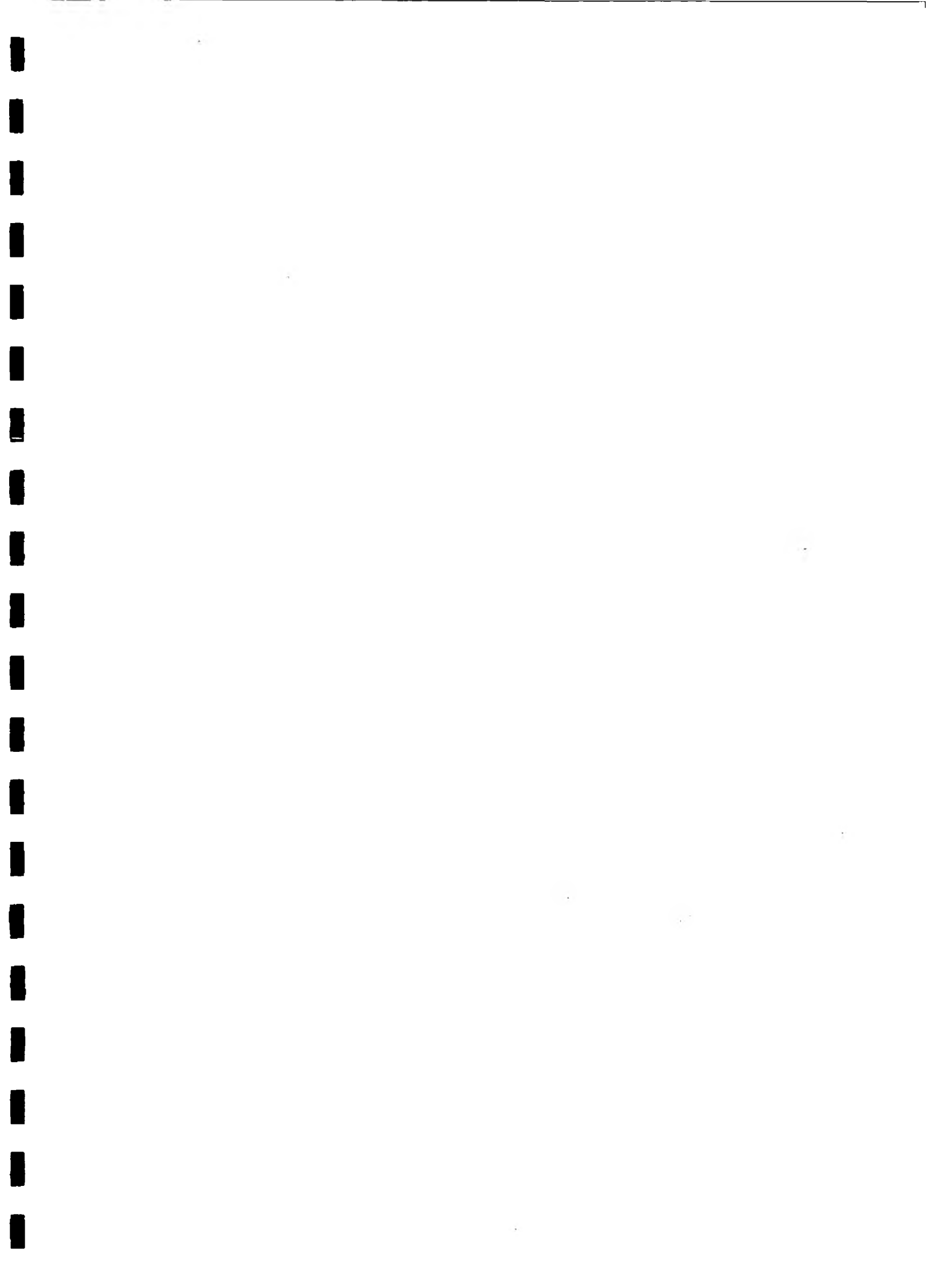
**Other water quality problems:**

- i) CSWs at Bispham discharging to Bispham Dyke. There are 4 surface water outfalls discharging to Bispham Dyke one of which is presently contaminated.
- ii) CSW at Elswick discharging to Thistleton Brook.
- iii) 2 CSWs at Staining discharging to a tributary of Main Dyke.
- iv) 2 CSWs at Garstang discharging to the River Wyre.
- v) CSW at Knott End discharging to the sea.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Resolution of outstanding CSW problems from the original CSWs identified.	LA (Environmental Health)/Industry/ Householders/The Agency	Improved water quality, resolution of CSW problems highlighted in the original project.	1997
Ensure newly identified CSW problems are resolved.	NWW/Agents/LA (Environmental Health)/ Industry/ Householders/The Agency	Improved water quality, resolution of new CSW problems.	1997-2002

**Constraints:** Costs and Resources for NWW/LAs/Householders.





## **Issue 10: Failure to comply with Water Quality Objectives due primarily to agricultural activities**

A large number of the classified watercourses within the Wyre LEAP Area presently fail to comply with the proposed short term and/or long term water quality objectives. Some of these failures are attributable to discharges from NWW WwTWs (see issue 7), discharges from combined sewer overflows (see issue 8) or discharges of contaminated surface water (see issue 9).

However, due to the intensively agricultural nature of most of the Wyre LEAP Area many failures to meet water quality objectives are due primarily to agricultural practices, although in some cases there will also be inputs from NWW WwTWs and smaller private sewage treatment works and septic tanks.

### **Failures to meet objectives:**

The stretches listed below are those for which agricultural activities are considered to contribute to the failure of a water quality objective.

- i) Significant failures to meet both the short term objective of RE5 (due to BOD) and the long term objective of RE4 in Lords (Inskip) Brook (due to BOD and ammonia). Inskip WwTW also discharges to this reach but the discharges from this works are not thought to significantly contribute to these failures.
- ii) Marginal failures to meet the objectives of RE3 in New Draught Brook (due to BOD and dissolved oxygen), Barton Brook (due to BOD, ammonia and dissolved oxygen) and Westfield Brook (due to BOD) - see also Issue 8.
- iii) Significant failures to meet the long term objectives of RE3 in Woodplumpton Brook due to BOD, ammonia and dissolved oxygen. Discharges from septic tanks are also thought to contribute to these failures - see also Issue 13.
- iv) Marginal failure to meet the long term objective of RE4 for the Old River Brook for BOD and dissolved oxygen. Discharges from septic tanks and private STWs are also thought to contribute to this failures - see also Issue 13.
- v) Marginal failure to meet the long term objective of RE4 for Thistleton Brook due to BOD. Elswick WwTW also discharges to this reach but the discharges from this works are not thought to significantly contribute to these failures.
- vi) Significant failure to meet both short term and long term objectives of RE2 for the River Calder due to ammonia - see also Issue 8.
- vii) Marginal failure to meet the objective of RE4 in the lower reach of the River Cocker for dissolved oxygen.
- viii) Significant failure to meet the long term objective of RE3 for Potters Brook due to BOD, ammonia and dissolved oxygen. Discharges from both Forton WwTW and smaller septic tanks are also thought to contribute to this objective - see also Issue 13.
- ix) Marginal failure to meet the long term objective of RE4 in Weeton Watercourse for BOD. Discharges from Weeton WwTW are also thought to contribute to this objective - see also Issue 13.
- x) Marginal failures to meet the objectives of RE4 in Pilling Water (due to ammonia and dissolved oxygen) and Ridgy Pool (due to dissolved oxygen).
- xi) Significant failure to meet the long term objective of RE1 in the upper reach of the River Wyre for BOD.

- xii) Failures to meet the long term objectives of RE2 in the lower reaches of the River Wyre below Garstang WwTW. Discharges from Garstang WwTW together with reduced river flows are thought to be contributory factors causing these failures - see also Issue 6.
- xiii) Marginal failure to meet the long term objectives (due to BOD) of RE3 in the Lancaster Canal.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Where appropriate carry out intensive water quality and ecological monitoring to identify and quantify inputs, e.g. Weeton Watercourse, Potters Brook, River Wyre below Garstang WwTW.	The Agency	Sources identified enabling prioritisation of proactive pollution prevention.	1997-1998
Continue farm inspections and where necessary carry out farm pollution control campaigns to identify and rectify point sources of farm pollution, e.g. Barton Brook Inskip Brook Lancaster Canal Thistleton Brook	The Agency Farmers	Improve water quality, achievement of water quality objectives. Improve macroinvertebrate community, resource for fish populations.	1997 1998 1997 1998-1999
Provision of additional treatment at WwTWs/revision of consent standards (if necessary).e.g. Weeton WwTW, Forton WwTW, Garstang WwTW.	NWW The Agency	Improve water quality, achievement of water quality objectives.	2000+

**Constraints:** Costs to farmers/NWW

**Issue 11: Impact of ICI Hillhouse International on the environment**

There is a significant chemical industrial site located on the Wyre Estuary at Thornton. There is some public concern about the perceived environmental impact of discharges of trade effluent to the Wyre Estuary, and of emissions to air.

The discharges of trade effluent from the site are controlled by a consent, and individual processes on the site are controlled by authorisations. The discharges contain List 1 and List 2 substances (see glossary) and monitoring of the discharges is carried out by both the Agency and the discharger. Monitoring of the Estuary demonstrates that current environmental quality standards are being met. Due to the complex chemical nature of the trade effluents not all individual chemical constituents are specifically monitored. In order to overcome this the Agency is looking at introducing a new consenting procedure in the near future. This is based on a consultation document produced by the Agency on 'the application of toxicity-based criteria for the regulatory control of wastewater discharges'.

ICI also own and operate a landfill site at ICI Hillhouse. The leachate arising from this is currently discharged along with trade effluent via the Lagoon Outfall into the Wyre Estuary. However changes to the operation of various plants on the site may result in the closure of the Lagoon Effluent Treatment System. This will lead to problems with the control and containment of tip leachate arising from the ICI tip.

The ICI Hillhouse site has been used for the manufacture of chemicals for many years. Poor storage and accidental spillages of various chemicals in the past will have led to contamination of the ground. There are proposals for the continued redevelopment of the site which may lead to the discovery of contaminated land problems. This will require appropriate remediation techniques to reduce the risk of pollution of groundwater as well as that of Royles Brook which runs through the site.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Continue monitoring to assess impact of discharges to Wyre Estuary.	Agency ICI	Identify actual and potential pollution.	1997-2002
Development of procedures for setting of 'toxicity based consents' for chemically complex discharges.	Agency ICI	Improved control.	1997-2002
Remediation of contaminated land.	Landowner, Developer, LA, Agency in advisory capacity	Reduce potential for pollution from the site.	1997-2002
Control and containment of tip leachate.	ICI	Reduce potential for pollution from the tip site.	1997-2002

**Constraints:** Costs to ICI  
Toxicity based consenting procedures not yet fully established.

**Issue 12: Loss of aquatic species diversity and flooding problems due to the impact of highway drainage from M6 (Junctions 32-33) and M55 Motorways.**

All major roads are constructed with drainage systems to remove surface water which can cause hazardous driving conditions. These surface water drains often discharge to the nearest available watercourse. The disposal of drainage from roads can place a significant burden on the aquatic environment affecting the risks of both flooding and increasing the pollution load.

Decreases in the diversity and abundance of pollution sensitive species e.g. mayflies and stoneflies have been detected in the River Wyre, Bacchus Brook and River Cocker.

**Failures to meet objectives:**

Highway drainage contributes to the failure to meet the long term objective in RE3 in the top reach of the River Cocker for BOD and dissolved oxygen.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Liaise with Highways Agency to identify polluting discharges and flood effects.	Highways Agency The Agency	Identify data on discharges requiring remedial work.	1997-2002
Improve drainage arrangements (reed bed maintenance, oil interception, silt traps) to limit pollution, flood water retention.	Highways Agency	Improved water quality and flood defence standards. Achievement of long term water quality objective.	1997-2002

**Constraints:** Schedule of work programmes.

**Issue 13: Deterioration in water quality due to a lack of sewerage facilities**

Section 22 of the Environment Act 1995 places a new duty on sewerage undertakers, via Section 101A of the Water Industry Act 1991, to provide, where appropriate, first time sewerage facilities in areas suffering from environmental or amenity problems caused by the existing sewage disposal arrangements. Developments in these areas will be restricted due to the inadequate draining facilities.

**Failure to meet objectives:**

Marginal failure to meet the objective of RE4 in Main Dyke below the former Staining WwTW. Sewage draining via Singleton village drain contributes to this failure.

Marginal failure to meet the long term objective in the top reach of the River Cocker for BOD and dissolved oxygen.

Marginal failure to meet the long term objective of RE4 for the Old River Brock for BOD and dissolved oxygen.

**Other Water Quality Problems:**

Halfpenny Lane, Longridge - septic tanks - impact on top reach of Blundell Brook.

Mains Lane, Little Singleton - impact on lower reaches of Main Dyke.

Occupation Lane, Little Singleton - impact on Wyre Estuary.

Bartle and Swillbrook - impact on Swillbrook, a tributary of Woodplumpton Brook.

Catforth - impact on Catforth Brook, a tributary of Woodplumpton Brook.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Pursue provision of first time sewerage facilities.	Householders LA The Agency	Improved water quality.	1997-2000
Provision of sewer connection or new WwTW.	NWW	Improved water quality.	by 2005

**Constraints:** Costs to NWW/Mechanism for progressing/prioritising areas not fully established.  
Costs to householders.

**Issue 14: Failure to meet Bathing Water Directive Standards at Fleetwood and Blackpool South beaches in 1996.**

Despite completion of North West Water's Fylde Coast Resewerage Scheme failures to meet the Bathing Water Directive standards (for total and faecal coliforms) were recorded at Blackpool South and Fleetwood beaches for the 1996 bathing season.

The Fylde Coast Resewerage Scheme was completed in 1996. Fleetwood Marsh WwTW provides secondary treatment for wastewater flows that were previously discharged with only preliminary treatment via the Manchester Square, Anchorsholme and Chatsworth Avenue pumping Stations at Blackpool, Cleveleys and Fleetwood together with wastewater from the Poulton area which was previously discharged to the Wyre Estuary at Skippool. Wastewater generated in the Blackpool area is now transferred via a 12km long tunnel flowing underneath the promenade to the new WwTW. Treated effluent is discharged via a 5km pipeline to an area of Morecambe Bay known as the Lune Deeps.

**Failures to meet objectives:**

Failures to meet the Bathing Water Directive standards (for total and faecal coliforms) were recorded at Blackpool South and Fleetwood beaches for the 1996 season.

<b>SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Monitoring of bathing waters and intensive investigations to assess reason for failures and identify any further work required.	The Agency NWW	Compliance with Bathing Water Directive standards, improved bathing water quality.	1997
Resolution of any outstanding problems found.	NWW LA	Potential benefit to tourism/improved public image.	1997

**Constraints:** Cost to NWW/Local Authorities.



**Issue 15: Environmental impacts of Jameson Road Landfill Site.**

Landfill gas produced at Jameson Road contains a useful amount of energy that can be recovered using special plant and equipment provided that the gas production rate is sufficient. If the rates of production are uneconomic for energy recovery landfill gas can be burnt off with specialised flares to reduce its potential for harm and consequently reduce its environmental impact.

Energy recovery from this site's landfill gas can contribute towards a more sustainable use of resources in the UK and can also assist in reducing the contribution of waste management activities to global warming.

Operation of the site gives rise to leachate which affects groundwater quality but it is not known to what extent. Measures are necessary to isolate the source of the leachate and contain it.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Implement gas extraction and energy recovery at Jameson Road landfill site.	Lancashire Waste Services as site operator has primary responsibility.  The Environment Agency can assist by encouraging the operator to fulfil this objective in line with Government Guidance (WMP4).	Reduced emissions of greenhouse gases.  Non-fossil fuel contribution to energy demands.  More sustainable resource management.	By 2001
Undertake chemical study of impact of leachate on surface and groundwaters.	The Agency	Determine degree of contamination.	1997-2002
Undertake detailed study of the landfill site to determine sources of leachate.	The Agency	Determine areas of site requiring remedial work.	1997-2002
Remedy situation by installing a leachate handling facility on site.	Lancashire Waste Services	Improved water quality. Protect groundwater.	1997-2002

**Constraints:** Planning need, financing of schemes, gas production (quantities and rates) at the site, management of any immediate landfill gas risk to take priority over energy recovery, possible need to phase any scheme due to financial and/or production constraints.

**Issue 16: Impact of contaminated land on the environment.**

Within areas of land which have been subjected to previous use that may have contaminated the soils and underlying groundwaters with a variety of substances which have the potential to pollute the environment. Ideally, the entire catchment should be subjected to a desk-study exercise to identify all such areas and to propose remediation work appropriate to the individual sites and the risk of pollution that they present.

The responsibility for ensuring remediation of land which is identified as being seriously contaminated rests in the main with the Local Authority - in the case of the Wyre catchment five local authorities are involved. New statutory controls relating to contaminated land are expected in 1997 and may well affect this LEAP issue.

Within the period of this plan the Agency proposes to focus attention on two areas of concern all of which impact on water quality. These are the former Fleetwood Metals site and the Wyre Waste Management site (both of which are located within the vicinity of Fleetwood Docks). The Agency intends to work with landowners and Local Authorities in an attempt to secure the clean-up of the two sites at Fleetwood Docks to allow their use for non-sensitive developments.

SITE	SOLUTIONS	RESPONSIBILITY	BENEFITS	PREFERRED TIMESCALE
Former Fleetwood Metals and Wyre Waste Management.	Assess potential risk posed to ground and surface waters and take appropriate remedial action.	Landowner LA Developer (The Agency in an advisory capacity).	Reduce pollution and potential pollution caused by the site.	1997-2000

**Constraints:** Although there is a large amount of land within the catchment which may be contaminated the statutory powers of the Agency in respect of such land are limited and much responsibility rests with the Local Authorities, land owners and land developers.  
No set standards relating to specific land uses.

**Issue 17: Waste minimisation and efficient water use.**

Future increases in urban development in the Wyre area and increases in industrial activity can have a significant impact on total waste produced and future demands for water. Therefore the Agency seeks to promote water efficiency and waste minimisation throughout the catchment, in industry and in the home.

Waste minimisation is a key issue in working towards a more sustainable future. The less waste that is produced the less the impact on the environment as resources are more effectively managed. It is an objective of the Environment Agency to find ways in which to encourage waste producers to reduce waste at source. There is a real need to reduce waste being produced by industry, commerce and from municipal collections.

To encourage waste minimisation, the Environment Agency will look to develop links with industry, schools, colleges and various interest groups in order to help educate and inform them as to the benefits and savings that can be made through effective waste minimisation.

Moreover the Agency will seek to influence the various waste management techniques employed at present in order to ensure best practice in the management of that waste which is produced. This will assist in achieving the aim of waste being dealt with in a more sustainable manner.

A number of initiatives will assist in dealing with this issue over the coming years. Notable examples are: "producer responsibility" and the "landfill tax", both of which will place incentives to minimise, recycle and re-use wastes.

<b>SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
1. Seek out opportunities in order to inform commerce, industry, schools, colleges and local interest groups to the benefits to be gained from waste minimisation.	NWW Industry Commerce Schools and Colleges Householder (Agency).	Increased awareness of the problem, reduce waste.	1997-2002.
2. Identify and quantify potential increases in water demand through future developments identified in the areas local development plans.	The Agency NWW LA	Identifies potential impacts on sources to establish their sustainability.	1997-2002
Implement demand management measures to control future demand for water, i.e. leakage control.	NWW	Wise use of water will help to protect the environment.	
Monitor effectiveness of demand management measures.	The Agency NWW	Provides feedback on whether or not measures are having an effect on demand.	

**Constraints:** The primary constraint of waste minimisation is one of cost - in, for example, introducing more efficient manufacturing processes, better identification the true level of waste production from industry and introducing better recycling initiatives.  
Lack of markets for recycled waste materials is a major constraint to furthering this waste management option.

**Issue 18: Landspreading of controlled wastes**

Landspreading is a form of waste recycling that is not subject to the rigorous controls of Waste Management Licensing. The exemption relating to landspreading allows a wide range of waste to be deposited, some of which may have the potential to pollute watercourses and groundwater and may give rise to problems of amenity such as odour and visual impact. Furthermore, these wastes may have disbenefits to the local ecology that need to be better understood.

The wastes in question include abattoir waste, agricultural wastes, excavation wastes, construction and demolition wastes, sewage sludge and paper pulp.

One aspect of the problem is that the wastes themselves may be "non-controlled wastes", that is wastes which are not subject to full legislative controls, consequently the Environment Agency will have only limited jurisdiction over them. An example of non-controlled wastes used in landspreading are those "wastes" which arise from agricultural activity, such as farm slurry.

Another factor that will have bearing over the period of the plan is the Directive preventing sewage sludge being deposited of at sea. Alternative routes will need to be found for this waste and landspreading is one of the practical options available.

The Environment Agency will seek ways of initiating and promoting research into the impact of landspreading such wastes (both benefits and disbenefits) and is promoting use of buffer strips to reduce diffuse pollution impacts from run-off. The Agency will also endeavour to improve the information systems used for recording landspreading and the monitoring of such activities.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
1. Seek to improve Agency information systems to record landspreading activities in the area.	The Agency	Increased control over the activities.	1997-2002
2. Seek to improve monitoring of application by visiting examples of landspreading activities.	The Agency	Increased control over the activities.	1997-2002
3. Maintain and develop links with ADAS and other organisations involved in landspreading to promote better understanding of issues by both parties.	The Agency Waste Producers	Increased understanding over the activities.	1997-2002
4. The Agency will encourage studies of the potential benefits and disbenefits of landspreading.	The Agency ADAS Educational establishments	Increased understanding over the activities.	1997-2002

**Constraints:** Widespread nature of landspreading.  
Legislation.

**Issue 19: The environmental impact of closed landfill sites**

The Agency holds information on closed landfill sites within the county of Lancashire although in many cases the records are incomplete. As a consequence of earlier waste disposal practices, many closed landfill sites lie in or close to urban areas and have the potential not only to impact upon the natural environment but also upon existing or proposed built developments.

Where the Agency holds adequate information on closed landfill sites it is able to provide advice to Local Authorities, landowners, developers and the general public as to the likely effects of the sites on existing or proposed developments. All too often the information is lacking in some way and the advice is of correspondingly lesser detail.

The Environment Agency would like to gather more information on the impact of these sites within the area enabling better advice and information to be made available. The Agency will encourage the gathering of such information as is necessary by those involved in land and property transactions, in particular where the information has a direct bearing on the transaction. When advising Planning Authorities on these matters, the Agency will seek to encourage the Authority to require the developer to submit any information they gather to the Agency and will in all cases seek to ensure that the information is made available as widely as possible.

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Seek funding in order to undertake investigations to ascertain the location and potential threat posed by any previously unidentified sites and sites where information is lacking.	The Agency Developers Local Authorities	Identify sites within the catchment that have previously had little, if any, information on them.	2000+

**Constraints:** Developers submission of information.

**Issue 20: Impacts of new development on flood defences**

The Wyre catchment is heavily dependent for flood defence on man made systems, which have been in place for many years. Defence standards are optimal rather than generous and are constantly under threat from new development and changes in land use and farm practice.

The Agency is limiting the effects of new development by requiring surface water run off rates to be at a level which does not exceed existing. Advice is available on acceptable rates and alternative drainage methods.

The Development pressure in the upper catchments could reduce the effectiveness of two of the areas main flood control structures, the Garstang and Catterall flood basins. There is pressure on the use of land right up to the bank edge of the flood defences in Garstang, St. Michael's, Preesall and Poulton, thus limiting access for essential maintenance.

Studies on flood risk at various sites have been commissioned over the next 5 years to aid the Planning Authorities in formulating their development plans. Studies due in the plan period are:-

- Coastal and tidal flood risk areas.
- Main Dyke - Poulton.
- Horsebridge Dyke - Poulton.
- Royles Brook - Thornton.
- Woodplumpton Brook - Catforth

<b>PREFERRED SOLUTIONS</b>	<b>RESPONSIBILITY</b>	<b>BENEFIT</b>	<b>PREFERRED TIMESCALE</b>
Inform Local Authorities of flood risks during strategic planning process.	The Agency	Prevent degradation of existing standards.	1996-2002
Promote the use of 'source control' to limit run-off whilst allowing development.	The Agency LA	Allows development. Doesn't increase flood risk. May produce enhanced habitat opportunities.	1998

**Constraints:** Co-operation of LA.

**Issue 21: Loss of water power mills as a landscape heritage feature**

Where watercourses remain unmodified water power mills still exist. This is true for Brock Mill, Caldervale Sandholme Mill, Oakenclough and Corless which have existed since the industrial revolution. Present day maps show the number of mill sites distributed over the Rivers Brock, Wyre and Calder to be 4, 5 and 5 respectively, though it is likely that there are many more. Currently these sites are not listed under Town & County Planning legislation. Therefore an investigation into the full extent of these sites is necessary to ensure that developers are aware of their existence and to lead to their protection under planning legislation.

PREFERRED SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Undertake a feasibility study to identify the heritage significance of water power sites on the River Wyre and Brock upstream of Garstang.	The Agency Archaeological Units	Provide information to enable the Agency to fulfil its statutory duty to protect sites and objects of archaeological interest.	1998/9

**Constraints:** Lack of knowledge of site locations.

## **1.7 PROTECTION AND PARTNERSHIP**

### **1.7.1 Introduction**

Much of the day to day work of the Agency is aimed at protecting the environment through education, prevention and environmental improvement.

This important work does not feature in the LEAP because the plan is primarily intended to address environmental problems and these are highlighted as issues in section 1.6. Much of this routine work is undertaken by the Agency to fulfil its duties and responsibilities. Examples include routine inspection at landfill sites to ensure licence conditions are being complied with, anti poaching activities by Agency bailiffs, routine river sampling to detect trends in water quality and site visits to factories/sewage works etc. to ensure discharge authorisation are being complied with.

However, the Agency recognises that it is not the only body operating in the field of environmental protection and improvement and that our responsibilities often overlap with those of other organisations.

Where appropriate the Agency will work with partners to achieve environmental protection and improvements. Much of this co-operation goes on at a day to day level between officers in the field and does not require any formal setting up.

Examples include negotiation between Agency inspectors and representation of individual companies over programmes of investment to improve environmental performance, or assistance afforded by the Police in difficult enforcement action.

However, in some cases the Agency does get involved in more formal partnerships and some of those which are relevant to this LEAP area are outlined below. Others are mentioned under the relevant issues in Section 1.6 of this plan.

#### **Shoreline Management Plans (SMP's)**

Shoreline Management Plans are produced by maritime local authorities and provide a strategic framework for sustainable coastal defences, and to set objectives for Shoreline Management in an area. The SMP's covering the LEAP are from Formby Point to River Wyre (Rossall Point) (The lead authority is Blackpool Borough Council), Rossall Point to Earnse Bay (the lead is Lancaster City Council). These plans are currently in preparation and the Agency is involved in this work.

#### **Coastal Zone Management Plans (CZMP's)**

Department of Environment Initiative. The Agency will be involved but will not be the lead.

#### **Local Authority Departments**

The Agency provides advice to Local Planning Authorities to ensure development does not damage the environment. This is achieved through consultation on development plans and commenting on development proposals. Other departments consulted on aspects of the Agency's work include: Environmental Health, Waste Disposal, Public Rights of Way and Access, Tourism, Drainage, Ranger Services, Ecologists and Archaeologists. This liaison occurs both at County, Borough and City Council level.

#### **Local Agenda 21**

The lead in developing local Agenda 21 is taken by Local Authorities. The Local Authorities in Lancashire are developing local Agenda 21 initiatives and meet quarterly to exchange ideas and information.

Within the Wyre these local authorities include; Wyre, Fylde, Blackpool, Lancaster and Preston. The Agency also has responsibilities with regard to sustainable development, and joins with the local authorities at their liaison meetings to assist in pursuing the goal sustainable development.

#### **Lancaster University Archaeological Unit**

Form part of the routine planning consultation process within the Wyre area.



## **Morecambe Bay Conservation Group**

This is an informal group organised through Lancaster City Council and is intended to focus public attention on the conservation value of the bay. Various activities are organised annually to increase public knowledge about the bay and its management. The Agency is on the group which steers the annual programme.

## **The Fire Service and Pollution Incidents**

The Agency is working closely with Lancashire Fire Service in providing a first line pollution prevention service at road traffic accidents.

The Fire Service are normally first on the scene at road accidents. This gives them a unique opportunity to deal with polluting spillages before they reach a watercourse. The Fire Brigade have agreed to undertake this role where practicable and the Agency has provided training and materials such as oil absorbents. The Fire Service will also notify the Agency of any potentially polluting spillages so that Agency staff can be on site to deal with follow-up action.

## **The Morecambe Bay Strategy**

This is intended to be the foundation of a partnership between the users and regulators of Morecambe Bay. The strategy has been prepared by Local Authorities and English Nature working with local people and organisations in accordance with Government guidance. The Agency has been closely involved in drawing up the strategy and will be heavily involved in implementing many of the proposals in collaboration with others.

## **Annual Conservation Liaison Meeting**

Staff from the Agency meet annually with local representatives of conservation organisations. The purpose is to discuss the Agency's annual flood defence maintenance programme and other relevant conservation related issues.

The other organisations represented include English Nature, Lancashire Wildlife Trust and the Royal Society for the Protection of Birds. The Agency also has an annual meeting with the National Trust with a view to working together on matters of mutual interest.

## **Site Emergency Plan**

As part of the County Council's emergency planning procedures, certain industrial sites have specific emergency plans. The Agency is involved in these plans to deal with any potential pollution problems which may arise. Exercises designed to test and improve procedures are held regularly, and include staff from the Agency.

## **Flood Warning Zones**

The Agency, in co-operation with the County Council's Emergency Planners, the Local Authorities and the Police, have set up flood warning procedures covering the whole coastline and specific inland areas on the River Wyre at Scorton, Garstang and St. Michael's.

## **Agricultural Development Advisory Service (ADAS)**

Provide advice/consultancy to the agricultural farming community.

## **Education Establishments**

The Agency provides education packs for schools and colleges covering areas of its work. Myerscough College holds annual open days where Agency staff are on hand to advise.

## **Wyre Salmon and Sea Trout Restoration Group (WSSRG)**

A partnership consisting of local angling clubs, riparian owners and The Environment Agency to improve Wyre migratory salmonid fishery.

## **Lune and Wyre Fisheries Association**

Quarterly meetings are held to discuss fishery issues in the Wyre and Lune

## **Farming Wildlife Advisory Group (FWAG)**

### **Industrial liaison**

Routine liaison and progress meetings are held between The Agency and industrialists. For example: North West Water Ltd, waste site operators and ICI Hillhouse International.

### **Highways Agency**

Liaison meetings in respect of highways issues.

### **Pond Life Project**

Liaison in respect of pond issues.

### **Barn Own Conservation Group**

Liaison in respect of biodiversity and conservation issues

### **MAFF Liaison Groups**

Liaison in respect of flood defence responsibilities, farming aspects and other Agency interests.

### **Country Landowners Association**

Ad-hoc liaison .

### **National Farmers Union**

Liaison as appropriate.

### **Recreational Organisations**

British Canoe Union and Ramblers Association.  
Ad-hoc meetings to discuss recreational issues.

## **2.1 USES AND RESOURCES IN THE AREA**

This section contains supporting information on the environment of the Wyre area. It focuses on the uses, activities and physical resources of the area in relation to the work of the Agency.

This "analysis" of the local environment has been helpful in identifying the issues outlined in Part 1 of the plan.

We welcome comments on the accuracy and content of this part, but this section will not be repeated in the action plan to be produced following consultation.

### **2.1.1 Hydrology**

#### **Rainfall**

To secure the proper management of water resources the Agency operates a hydrometric network of rainfall and riverflow gauging stations (see map 4). These provide not only data for water resources assessment but also for flood prediction, impact of effluent discharges, fisheries management, conservation and recreation.

The long term average annual rainfall (LTA), based on 1961-1990 data, varies from 1860mm in the headwaters at Hare Syke (Tambrook Wyre) to 960mm in the lowland areas around Hambleton with an overall catchment average rainfall of 1220mm.

Fig. 1a compares rainfall during the drought of 1995 with the LTA.

Rainfall is measured in the area by a network of raingauges consisting of Storage Gauges (read manually on a daily or monthly basis) and Tipping Bucket Raingauges (TBRs) which monitor continually and log the data. This logged data depicts rainfall events (amounts over periods of time) and can be used in rainfall return period analysis.

All the gauges form part of the Agency's rainfall measurement network.



**Wyre  
Local Environment Agency  
Plan  
Map 4**



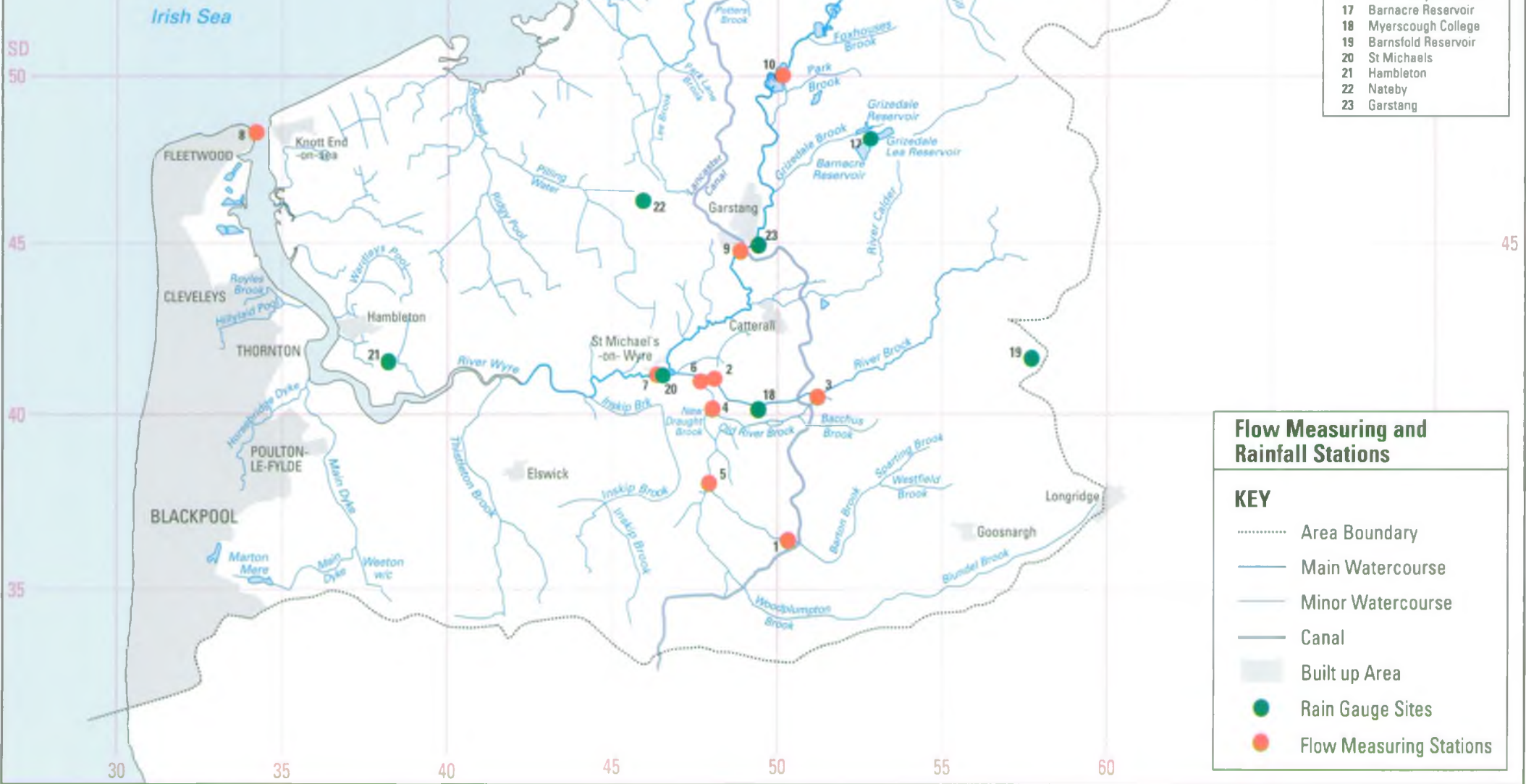
ENVIRONMENT AGENCY

SD 40 45 50 55 60 65



0 5km

- 1 Hollowforth Hall
- 2 Roe Bridge
- 3 Up Stream A6
- 4 Myerscough
- 5 Carvers Bridge
- 6 Up Stream Brock
- 7 St Michaels FMS
- 8 Fleetwood FMS
- 9 Garstang FMS
- 10 Scorton
- 11 Abbeystead
- 12 Hare Syke
- 13 Abbeystead Gardens
- 14 Abbeystead Reservoir
- 15 High Cross Moor
- 16 Damas Ghyll Reservoir
- 17 Barnacre Reservoir
- 18 Myerscough College
- 19 Barnsfold Reservoir
- 20 St Michaels
- 21 Hambleton
- 22 Nateby
- 23 Garstang

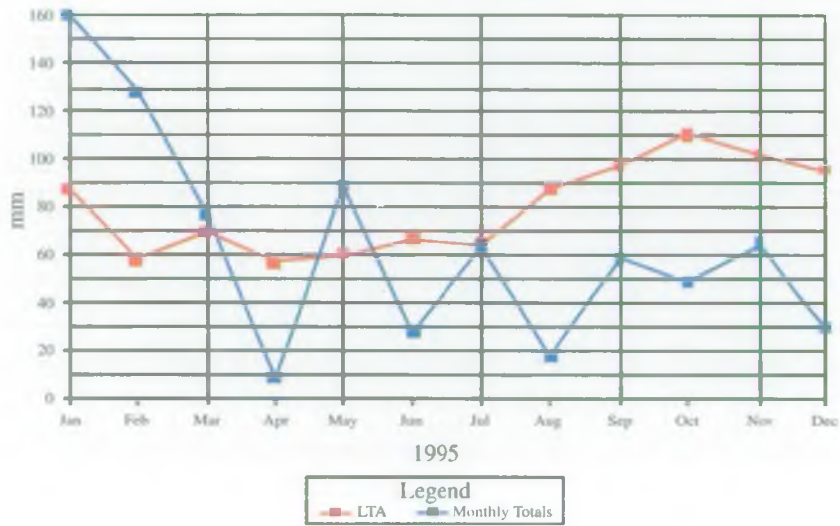


**Flow Measuring and Rainfall Stations**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Rain Gauge Sites
- Flow Measuring Stations

### Hambleton Raingauge Monthly Totals & LTA's



**Figure 1a**

This Gauge is situated in the lower reaches of the catchment

#### Hambleton Raingauge SD382415

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long Term Average 1961 - 1991	88	58	70	57	61	67	65	88	98	111	120	96
Monthly Totals 1995	160	128	77	9	89	28	64	18	59	49	65	30

### Hare Syke Raingauge LTA's & Monthly Totals

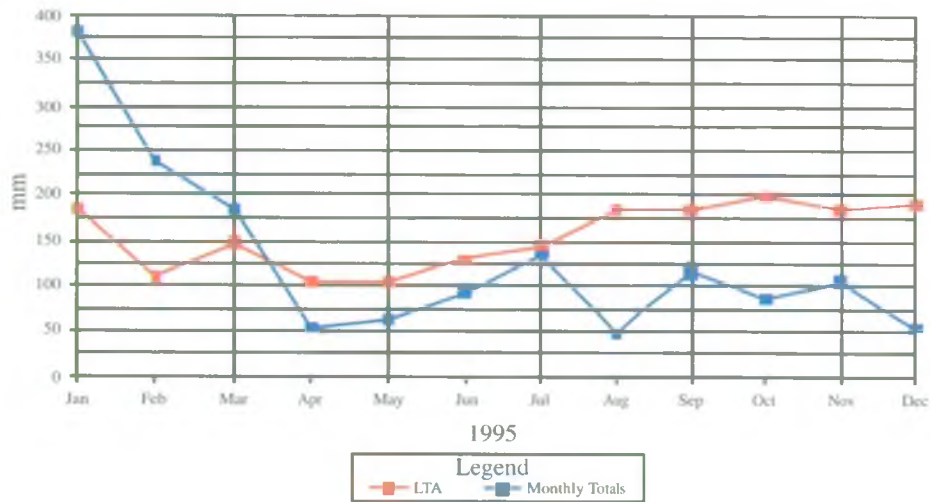


Figure 1b

This gauge is situated in the upper reaches of the catchment

#### Hare Syke Raingauge SD599578

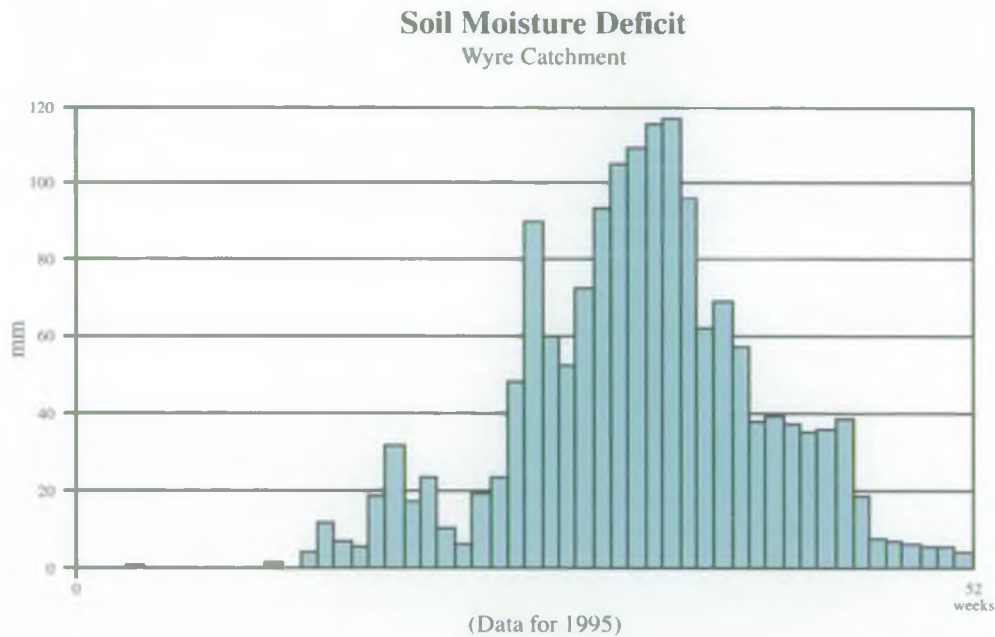
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Long Term Average 1961 - 1991	184	108	148	104	103	130	145	184	184	199	183	189
Monthly Totals 1995	383	237	183	56	63	92	135	47	114	87	105	55



At any time the availability of water resources will be a function of the rain fallen, capacity for storage of that rainfall and the manner in which it is exploited.

It is misleading to accept rainfall alone as an indicator of the available resources since it is subject to evaporation and other losses. It is the residual rainfall that determines the quantities replenishing groundwater and surface flows.

The effect of rainfall varies with its intensity and the state of the catchment. Soil moisture deficit (SMD) is a measure of the dryness of the soil, and is expressed as the amount of rain (mm) required to bring the soil to a saturated state and is generally higher in the summer than in winter. As an example, Figure 2 shows the 1995 daily values of SMD for the Wyre catchment.



**Figure 2**

Data supplied by the Met Office.

### River Flows

There are three primary flow measuring stations on the Wyre situated at Scorton SD50144998 Catchment Area 88.8 km<sup>2</sup>, Garstang FMS SD48864472 Catchment Area 114.0 km<sup>2</sup> and St Michael's SD46344112 Catchment Area 275.0 km<sup>2</sup>.



**St Michael's**  
Mean Daily Flow

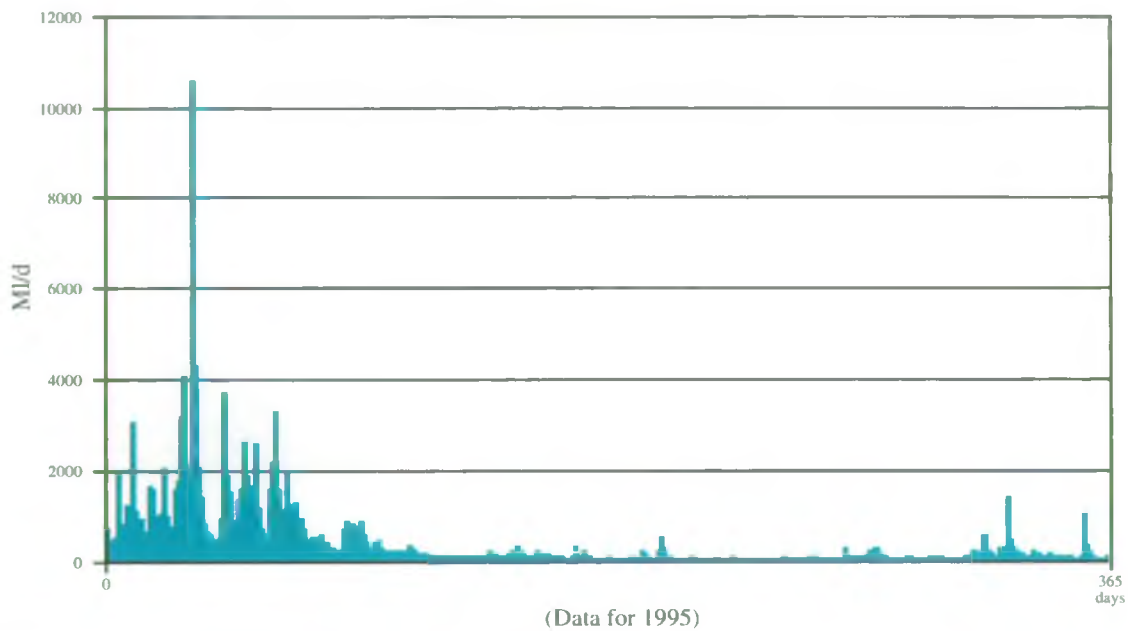


Figure 3

The total catchment area to the tidal limit at SD 421411 is 318 km<sup>2</sup>. total catchment area = 587 km<sup>2</sup>.

It can be seen from figures 1, 2 and 3 that although 51.7% of the annual rainfall occurred from May to December 1995, due to the high SMD over the same period there was little effect on the river flows.

**Issues Arising:**

**There are no issues arising.**

## 2.1.2 Fisheries

### Background

The Wyre catchment supports recreational fisheries for both coarse and game fish species. The estuary and coastal waters support commercial sea fish and shellfish fisheries. There is a commercial fishery for elvers (juvenile eels) and adult eels.

The Environment Agency regulates the game fish, coarse fish and eel fisheries, through licencing and controlling fishing seasons and fishing methods. A National Rod Licence is required to fish for freshwater species and is valid throughout England and Wales. The North Wales and North Western Sea Fisheries Authority regulates the commercial fishery for sea fish and shellfish.

### WSSRG Partnership

The Wyre Salmon and Sea Trout Restoration Group (WSSRG), a partnership consisting of local angling clubs, riparian owners and the Environment Agency, was formed in 1994. The group was created to improve the Wyre migratory salmonid fishery. In 1995 a study was commissioned to summarise rod catch, redd count and fisheries survey data (the 1992 juvenile salmonid and coarse fish survey) and a habitat survey was undertaken to establish what factors were limiting the migratory salmonid population. The report made recommendations of actions which might lead to improvement. A programme of work is now underway and some of the recommendations of the report were carried out in 1995 (improvements to Abbeystead fish pass and the creation of 7 new areas of spawning gravel on Grizedale Beck, Joshua Beck and the main river at Abbeystead). Outstanding issues are addressed within the LEAP.

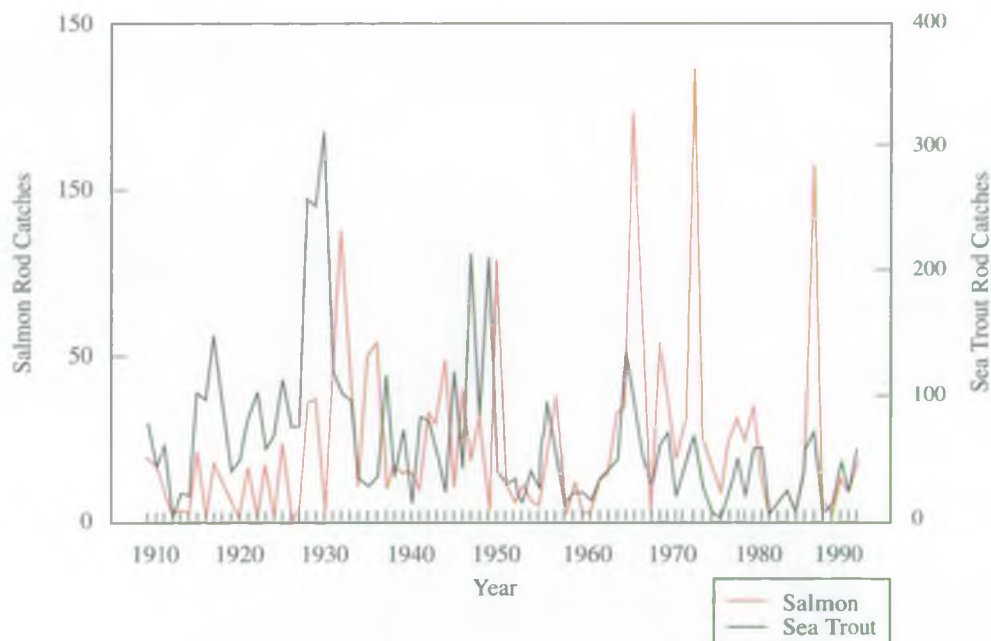
### Salmonid Fishery

#### General

Flow, habitat and in river obstructions have been shown to affect juvenile salmonid densities in many rivers. It has long been suspected that the physical nature of the catchment, combined with anthropogenic influences have resulted in a less than optimal Wyre fishery (see map 5).

The River Wyre supports a run of salmon and sea trout which are fished for from Abbeystead downstream to the tidal limit. The rod catch has ranged from 6 to 401 since records began in 1905.

**River Wyre Migratory Salmonid Rod Catches**  
(1910-1993)



Wyre  
Local Environment Agency  
Plan  
Map 5



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



5km

Irish Sea

SD  
50

55

50

45

40

35

30

35

40

45

50

55

60

**Distribution and Density of Adult and Juveniles (Survey 1992)**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Sea Trout Present (T)
- Salmon Present (S)
- A Excellent
- B Good
- C Fair
- D Poor
- E Absent
- Fish Age:  
0+ less than 1 year  
>0+ more than 1 year

0+	>0+
S	
T	





The river is also fished for brown trout and this species is regularly stocked at a takeable size (larger than 200mm) by the various riparian owners and angling clubs which have fishing rights in the area.

The distribution of juvenile salmon within the catchment is limited. Where juvenile salmon are found they are only present in low densities. The 1992 stock assessment survey showed that the majority of juvenile salmon production in the catchment is in the main river between Scorton and Garstang. Sites upstream of Scorton have either poor juvenile salmon densities or salmon are absent completely. No juvenile salmon are present in Tarnbrook Wyre, Damas Gill or Foxhouses Brook, though sea trout use these areas. Salmon are found in only two sites in the Marshaw Wyre and one site in Cam Brook. No evidence of salmon spawning can be found downstream of Garstang. Spawning gravels are present in the Upper Wyre tributaries immediately upstream of Abbeystead Reservoir although the gravel size is thought to be larger than the optimum preferred by salmonids. Several brooks, including Grizedale and Foxhouses Brooks and the main river at Garstang carry heavy silt loads, and this is thought to be affecting spawning gravels and egg survival. Gravel cleaning, prior to the spawning season is planned for 1997 in conjunction with WSSRG club members. Suitable areas for salmon and trout parr is not thought to be limiting ( a total of 7.5km is available in the main river).

A programme to stock the Wyre catchment with juvenile salmon from broodstock from the River Lune has been carried out since 1993. In addition, in 1996, 1997 (and 1998) salmon smolts reared under contract by the WSSRG were stocked. These fish were adipose fin clipped and microtagged. Their capture by high seas nets and by anglers in the river will provide information on the location and scale of their exploitation.

## Trout

The distribution and densities of juvenile trout found in the Wyre catchment are generally higher than those of juvenile salmon. The presence of juvenile trout in Marshaw Wyre and Tarnbrook Wyre are likely to reflect the greater resistance of juvenile trout to acid stress. In Tarnbrook Wyre, the good densities of trout found probably result from resident brown trout spawning upstream of Lee's Bridge Weir. Sea trout spawning is largely confined to the brooks and Upper Wyre tributaries. Trout densities in the main river are low or absent, probably as a result of the limited availability of spawning substrate. The very high densities of both 0+ and older than 0+ juvenile trout found in Damas Gill highlight the importance of this brook as spawning and nursery habitat for trout. It is likely that Damas Gill produces a large proportion of the juvenile trout and sea trout in the Wyre catchment (see map 6)

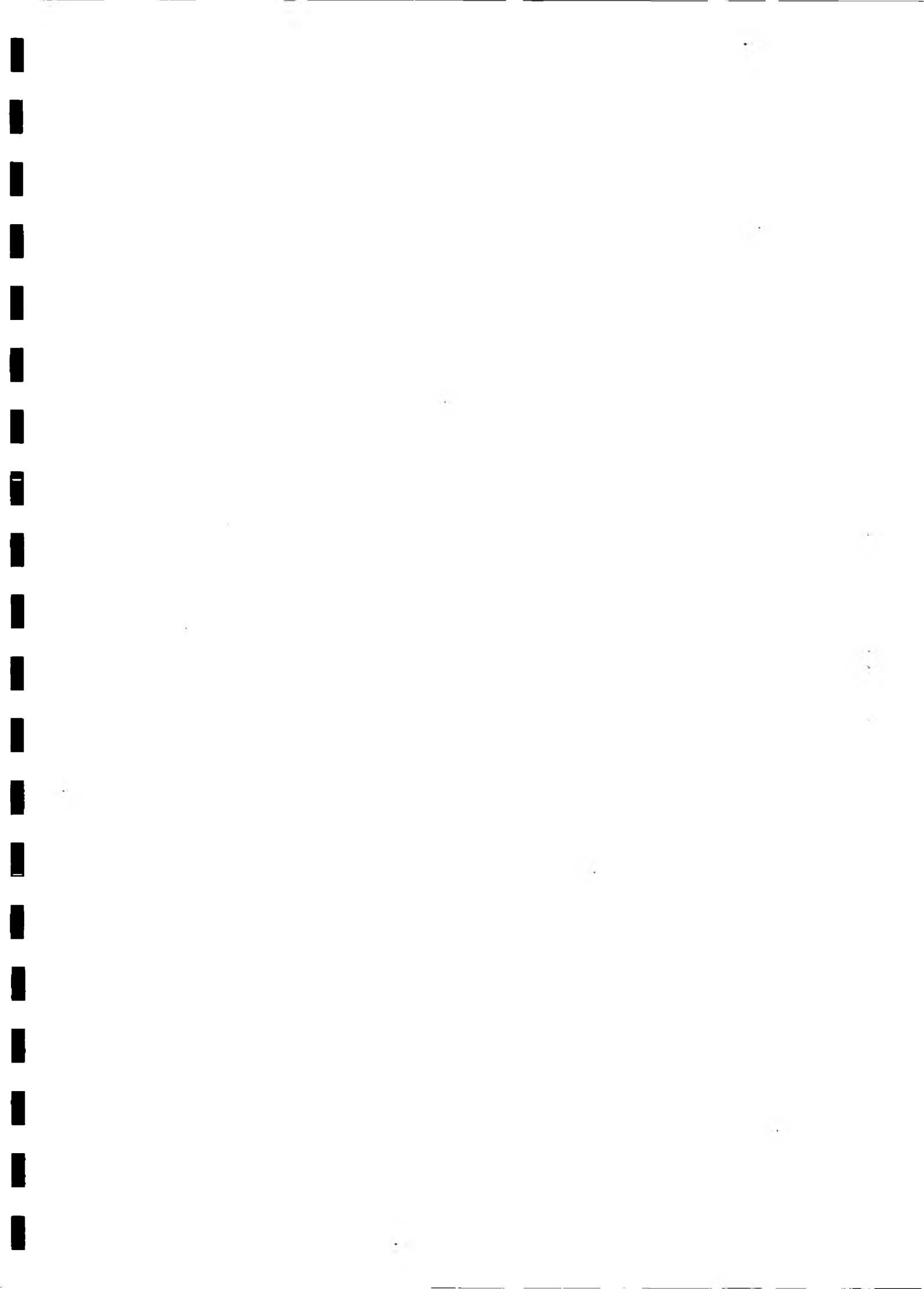
The River Cocker is known to have a residential brown trout population. There is a tidal barrier at the river mouth which effectively blocks the passage of migratory salmonids.

## Coarse Fishery

An established mixed coarse fish fishery exists between Churchtown Weir and Great Eccleston (see map 6). Eleven coarse fish species are found in the River Wyre between the tidal limit and Dolphinholme, including chub, roach, dace, bream, gudgeon and pike together with the minor coarse fish species bullhead, stone loach, minnow, stickleback and eel. Minor coarse fish species are present throughout the catchment. Chub are the dominant species in terms of biomass. A target biomass for coarse fish in a lowland river such as the lower Wyre is accepted as being 200-400kg/hectare. In the area of river exploited by coarse anglers, coarse fish biomass at all of the sites studied (except one) are above this minimum level and, because of the inefficiency of the sampling technique used in the deep waters below Churchtown Weir, are probably higher. Juvenile coarse fish were absent from all of the survey sites studied, possibly as a result of the inefficiency of the survey method in deep water. Alternatively this may reflect poor spawning success and/or juvenile survival in the lower river. The apparent very low level of juvenile recruitment of the major coarse fish species in the Wyre below Churchtown Weir is likely to be due to the limited amount of suitable spawning and nursery habitat present in this area. Juvenile chub are found upstream of Garstang, where suitable spawning and nursery habitat is available. There is no evidence from the survey results of a greater than expected pike population in the survey area as had been suggested by some local anglers. However further investigation is required.

The Wyre, downstream of Churchtown Weir, has been extensively stocked with coarse fish. The species stocked include roach, dace, chub and bream adults of which were found in the 1992 survey. In addition, the river between Churchtown and St. Michael's was heavily restocked with chub, roach, bream, perch, carp and trout following a major pollution incident in June 1984. The Environment Agency has stocked with juvenile coarse fish (2 year old chub, dace and roach from the Leyland fish Farm) from 1994 to 1996 to mitigate for the low recruitment rate of coarse fish. Barbel are also known to be present in the stretch below Churchtown.





The Lancaster Canal runs through the catchment and is known to contain bream, perch, roach, carp, tench, ruff, pike and eels.

A commercial elver fishery operates on the River Cocker and downstream of St. Michael's on the Wyre, regulated under licence by the Environment Agency. Licences are issued to fish for elvers using dip nets and adult eels using fyke nets or traps.

## **Sea Fishery**

Within the Wyre Estuary there are commercial net fisheries for marine species such as mullet and bass using both mobile and set nets or lines. The Estuary and surrounding areas of Morecambe Bay also support mussel, cockle and shrimp fisheries. The limit of the Sea Fisheries District ends at the seaward side of the road bridge carrying the A588. (See map 7).

## **ISSUES AND TARGETS**

### **A) Fisheries**

There appears to be a lack of suitable quality salmonid spawning substrate (see map 8) in large areas of the catchment. This is due to Abbeystead reservoir intercepting gravel and preventing the main river gravels below the dam from being replenished when they are washed downstream during spates. The feasibility of transferring gravels from above Abbeystead reservoir to the river below the dam with the assistance of the Duke of Westminster Abbeystead Estate will be investigated.

Finely suspended solids and silts are discharged from erosion points and from drained farm land. This results in the siltation of the gravel spawning beds and further restricts the success of spawning and subsequent survival of eggs and fry. The Agency will develop a work programme to improve the quality of spawning areas for salmonid and coarse fish in collaboration with riparian owners and the WSSRG clubs and members.

Several barriers, either full or partial, to fish migration have been identified (see map 8). The Agency will instigate a programme of works to ease barriers to the migration of salmonid and coarse fish.

Extensive Flood Defence works have been carried out in the lower catchment, particularly between Churchtown and Great Eccleston since the beginning of the century. These works have included straightening and bank reformation work as well as the creation of two flood basins at Garstang and Catterall. The Flood Defence works, essential to prevent regular flooding of the town of St. Michael's, have had a major impact on the amount, diversity and quality of riverine habitat for coarse fish in the lower Wyre. Little or no work has taken place in the river itself in recent years and the habitat should have stabilised and be fully exploited by coarse fish. The work does appear to have had an effect on coarse fish recruitment and there appears to be very little suitable spawning substrate or nursery habitat in the lower river for coarse fish. A long term solution would be to rehabilitate and create spawning habitat. First a full habitat assessment of the Wyre downstream of Churchtown Weir should be carried out to provide an estimate of the amount and location of coarse fish spawning and juvenile habitats. Where it does not compromise Flood Defence standards this area should also be considered for fencing and planting of trees to provide habitat for fish.

Several tributaries of the Wyre, including Barton Brook, Westfield Brook, Sparging Brook and Little Calder are impacted by high ammonia levels, in the form of diffuse inputs, from intensive dairying which makes them unsuitable for the salmonids. By educating farmers in the ways of good agricultural and best management practices and where possible the creation of riparian buffer zones on these brooks it may be possible to lower the ammonia levels. Buffer zones would also help to stabilise the banks thus reducing the silt input and would also increase the diversity and distribution of habitat for fish by providing cover, and a riparian food source.

The runoff from the upper Wyre catchment can be acidic (down to pH 4-5 in the Marshaw Wyre) during spates and this limits the survival and distribution juvenile salmon and trout. Trout are less sensitive to acid events than salmon and are more frequently found in these areas.

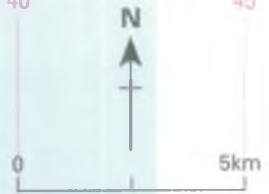


**Wyre  
Local Environment Agency  
Plan  
Map 7**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



**Commercial Fisheries**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Limits of Sea Fisheries District
- Eel Net Fishery
- ▨ Shrimp Fishery
- Mussel Fishery
- Cockle Fishery
- ▨ Long Lining
- Fixed Engines / Mobile Nets



Given the limited number of returning salmonid adults, it is important that their movement and exploitation is closely monitored. The Agency will carry out monitoring of the salmonid and coarse fisheries stock, using electro-fishing and hydro acoustic surveys and annual redd counting surveys, to monitor the effectiveness of the proposed spawning gravel and habitat improvements. Accurate data on abundance and movement of adult salmonids is required to aid effective management of the stock. Subject to the availability of funding and the future development of hydro acoustic counters, it is proposed to reinstall a fish counter at a suitable site on the main River Wyre. Due to difficulties encountered in surveying, it is very difficult to obtain good quality stock assessment data on coarse fish populations in the deeper areas of the lower river. Maximum use must be made of information provided by coarse anglers catch statistics. Coarse anglers who regularly fish the Wyre should be encouraged to participate in the Coarse Angling Log Book scheme which could provide good quality catch per unit effort data from the coarse fishery.

The objective of the salmon stocking programme is to increase the spawning stock to a self sustaining but higher level than exists at present. The survival of stocked fry, and the success of artificial spawning areas will be assessed by targeted electro-fishing surveys. Coarse fish stock levels in the Wyre could decline in future years as the existing adult stock declines through natural mortality. This has been mitigated for in the short term by stocking of the coarse fishery below Churchtown weir with juvenile coarse fish (roach, dace and chub) from the Agency's Leyland Fish Farm.

### **Issues Arising:**

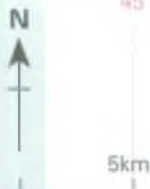
- Issue 2:**            **The protection and restoration of existing and degraded important habitat types and their associated species, to protect and increase biodiversity.**
- Issue 3:**            **Impact of barriers restricting the distribution of fish in the Wyre area.**
- Issue 5:**            **Artificially induced low flows in the catchment.**
- Issue 6:**            **Failure to meet freshwater fisheries directive standards.**

**Wyre  
Local Environment Agency  
Plan  
Map 8**



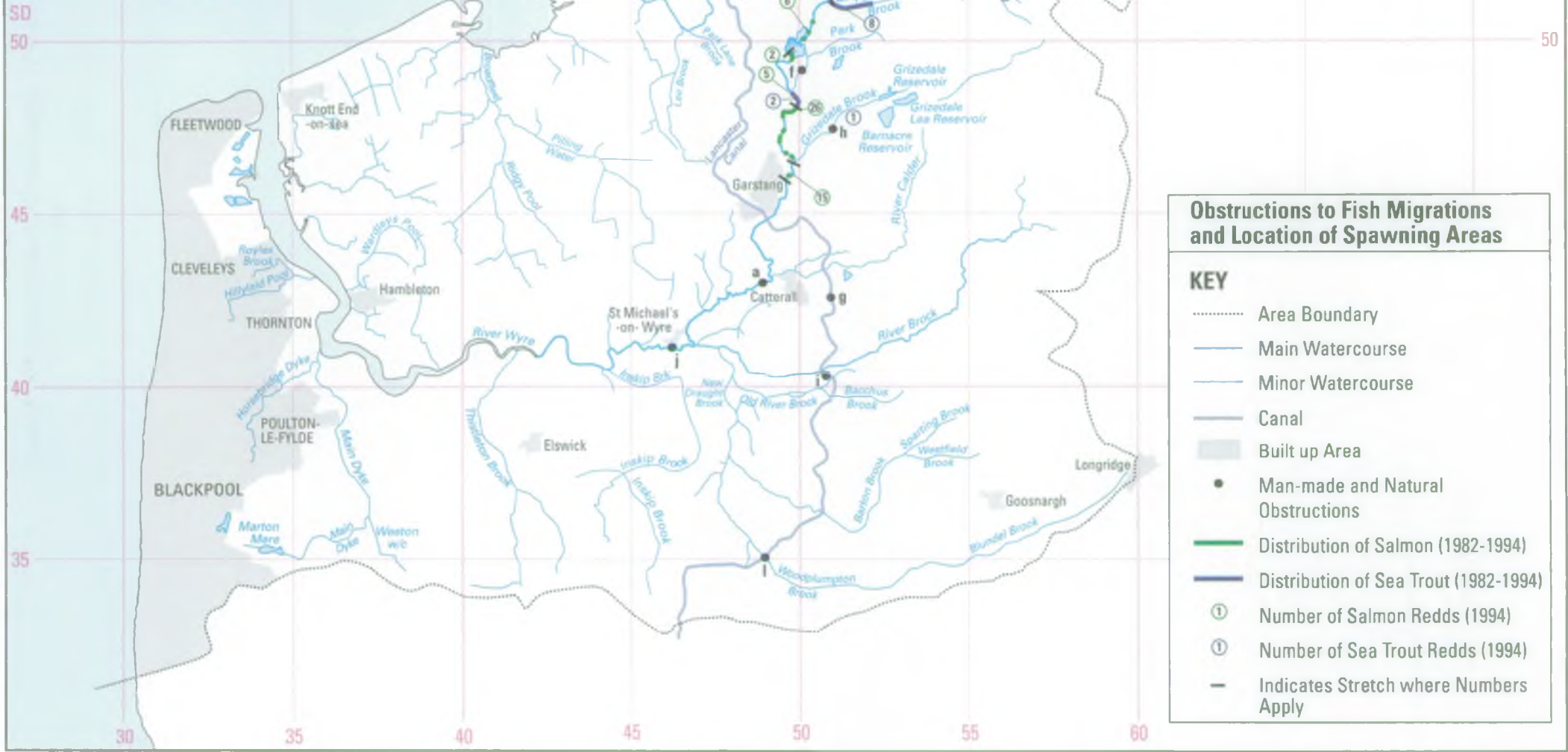
ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



- a Churchtown Weir
- b Street Weir
- c Abbeystead Dam
- d Tarn Lea Bridge
- e New Road Revetment Works on Fox's Beck
- f Old Mill Sluice, Park Brook Scorton
- g River Calder
- h Grizedale Dam and Pipe Bridge
- i Brock
- j St. Michael's Weir
- k Cam Brook Force
- l Aqueduct, Woodplumpton Brook

Irish Sea



**Obstructions to Fish Migrations and Location of Spawning Areas**

- KEY**
- ..... Area Boundary
  - Main Watercourse
  - Minor Watercourse
  - Canal
  - Built up Area
  - Man-made and Natural Obstructions
  - Distribution of Salmon (1982-1994)
  - Distribution of Sea Trout (1982-1994)
  - ① Number of Salmon Redds (1994)
  - ① Number of Sea Trout Redds (1994)
  - Indicates Stretch where Numbers Apply

### 2.1.3 Recreation

The Wyre catchment offers full and varied opportunities for recreation (See also map 9). The tourist industry has its centre at Blackpool, the famous 'Golden Mile' being the main area for seaside leisure activities, including bathing and walking or cycling along the promenade. A coastal path follows the line of the promenade to Fleetwood and follows the Wyre Estuary inland crossing the Wyre on the A588 road bridge, back along the Estuary passing Barnaby Sands Marsh to Knott End and then follows the coast north. The coastal path is used for walking, cycling and bird-watching and affords picturesque views of the Estuary and coast. The Wyre Estuary and Morecambe Bay are SSSI's. Morecambe Bay is also an SPA and SAC.

Apart from its urbanised areas, the catchment has a small network of public footpaths, cycleways and bridal paths including the Lancashire Cycle Way which traverses the catchment. The Lancashire cycle way consists of two circular cycle routes, each about 130 miles long. The northern route passes through the scenic Fylde catchment and follows lightly used minor roads as much as possible. The Local Authority have promoted the use of Wyreside walks downstream of St Michael's. There is also a nature trail on the banks of the river at Scorton. The equestrian centre at Moss Edge acts as one of the focal points for horse riding and pony trekking. The Upper Wyre catchment falls within the Forest of Bowland which was designed as an Area of Outstanding Natural Beauty in 1964. The Trough of Bowland and Beacon Fell Country Park are well used by local residents and visiting tourists alike for walking, cycling, picnicking and bird-watching and Lane Ends recreation area at Pilling offers similar facilities. Parking and picnic sites, including one site owned by the Agency, are spread throughout the Wyre catchment and heavily utilised. Caravan and camping sites are spread throughout the catchment to cater to the visitor.

The Wyre Estuary downstream of the tidal limit at Little Eccleston is the main area utilised for water sports including yachting, water skiing, jet skiing, and motor boats. Five slipways exist within the catchment, two are for use by the public at Knott End and Stanah and three are for private use at Little Thornton, Wardleys and Bank Houses. There is a boating lakes at Fleetwood Marine Gardens. Although there is no right of navigation above the tidal limit, canoeing does take place on the River Wyre from Garstang downstream. The majority of canoeing takes place on the flat water above small weirs although local canoe clubs use the river at Garstang as a slalom training site.

The River Wyre supports a game and coarse fishery for angling which is used by several local angling clubs (see Fisheries Section). The Wyre catchment is also noted for the number and distribution of its still waters, many of which contain coarse or salmonid fish species fish and are controlled by angling clubs or operated as commercial day ticket waters for the general public.

The Lancaster Canal provides facilities for navigation and angling. Approximately 700 canal craft are based on the 42 mile length from Preston to Tewitfield, however a survey has shown that on average only 4 boat movements occur per day. The canal has proved to be a popular fishery with some matches attracting up to 1000 anglers. The towpaths are used by walkers and by cyclists. Commercial pleasure boat trips on the canal are available in the Garstang area. The recreation facilities offered by the canal are managed by British Waterways.

#### Issues Arising:

- Issue 4:            **Poor access to the watercourse and coast for recreational use.**  
Issue 14:           **Failure to meet Bathing Water Directive standards at Fleetwood and Blackpool South in 1996.**



**Wyre  
Local Environment Agency  
Plan  
Map 9**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



**Recreation**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Breacon Fell Country Park
- Trough of Bowland
- Forest of Bowland AONB
- - - Lancaster Cycle Way
- ⚓ Boat Launch
- Ⓐ Picnic Sites
- Bathing
- Wildfowling
- Nature Trail

**BOATING:**

- ▨ Yachts, Water Skiing, Wind Surfing, Canoeing
- Canoeing (Unofficial)

**COASTAL PATH:**

- Walking, Cycling, Birdwatching
- Microlights

## 2.1.4 Landscape and Heritage

### General

The Environment Agency has a duty to conserve and improve the natural beauty of inland and coastal waters, and associated land, and to consider the need to protect and conserve buildings and objects of historic interest. As well as covering nationally important sites, local sites of interest are also considered.

Opportunities for improvement are achieved through the activities of third parties, by the Agency working with Local Authorities and developers and through work undertaken as part of the Agency's capital and maintenance programmes.

### Local Perspective

The Wyre catchment occupies a large area of central Lancashire and is comprised of mainly rural agricultural landscapes ranging from the high pennine moorland in the east to the relatively flat and fertile agricultural land on the Fylde coast. A character map of England produced by the Countryside Commission in association with English Nature splits the country into 181 character areas. These character areas are identified on the basis of local distinctiveness; broad management opportunities are sought which will help conserve, enhance and restore the character of the countryside. The Wyre study area falls into 3 character areas: Morecambe Coast and Lune Estuary; Lancashire and Amounderness Plain (both of which comprise the Natural Area of the Lancashire Plain and Valleys) and the Bowland Fringe and Pendle Hill character area. Designated landscape areas include the Forest of Bowland Area of Outstanding Natural Beauty (AONB), an area of high moorland affording extensive views towards the Fylde coast and the mountains of the Lake District. An Area of Special Landscape Value has been identified to the south of the area extending from the Ribble Valley to the village of Wharles.

The study area is divided roughly in two along a north/south line by the M6 motorway, the closely associated London-Glasgow railway and the Lancaster Canal. To the east the land slopes down from the sweeping open landscape of heather clad moorland to deep and often well wooded tributary valleys. Fields are generally small to medium sized and field boundaries are mostly drystone walls. From Street the valley broadens into a flat valley floor with distinct valley sides. The valley floor near Scorton has been extensively quarried and numerous flooded quarry pits are found. To the west the landscape is gently rolling or flat and dominated by medium to large fields of improved pasture bounded by hawthorn hedges and wire fences. From Wyre bridge to St Michael's on Wyre the valley floor remains broad and flat, with a distinct valley side rising relatively steeply to the east. From Churchtown to the Estuary, long sections of flood embankment form a dominant feature in the landscape and tightly confine the largely straightened river channel. Tree cover is occasional along the middle sections of the river; there is little tree cover towards the Estuary. The coastal areas are equally varied and contain the major holiday resorts of Blackpool and Cleveleys linking to the deep water fishing port of Fleetwood at the mouth of the River Wyre. The popular sandy beaches of the Fylde coast contrast with quieter areas of important bird habitats of mud flats and salt marshes associated with the Wyre and Lune Estuaries to the north. Raised mires or mosslands are found at Cockerham and Winmarleigh and are particularly important for their rare landscape and heritage value.

Development along the coast from Blackpool to Fleetwood comprises the main centres of population and built landscape in the study area. Inland settlement is comprised of small agricultural villages and hamlets with the large urban towns of Preston and Blackburn lying just outside the Wyre study area boundary to the south.

North of the small market town of Garstang the area is characterised by the numerous 18th century stone built water mills and associated workers cottages such as Street and Coreless Mills. South of Garstang, where the remains of Greenhalgh castle are to be found, there are numbers Halls, some with evidence of medieval occupation such as the moated site at Larbeck Hall and the remains of a chapel at Rawcliffe Hall.

The area has suffered a loss of landscape character. Hedgerows and hedgerow trees throughout the study area are being lost through agricultural improvements whilst many dry-stone walls in the upland areas remain damaged and unrepaired. Aerial surveys taken between 1963 and 1988 indicate the loss of 25% of the hedgerows within the County of Lancashire in the 25 year period.

Agricultural and other development also continues to cause loss of haymeadows, mosses and other important habitats of conservation and landscape value. Hedgerows and walls also provide an important wildlife habitat in agricultural land which has become increasingly sterile to native plants and wildlife.

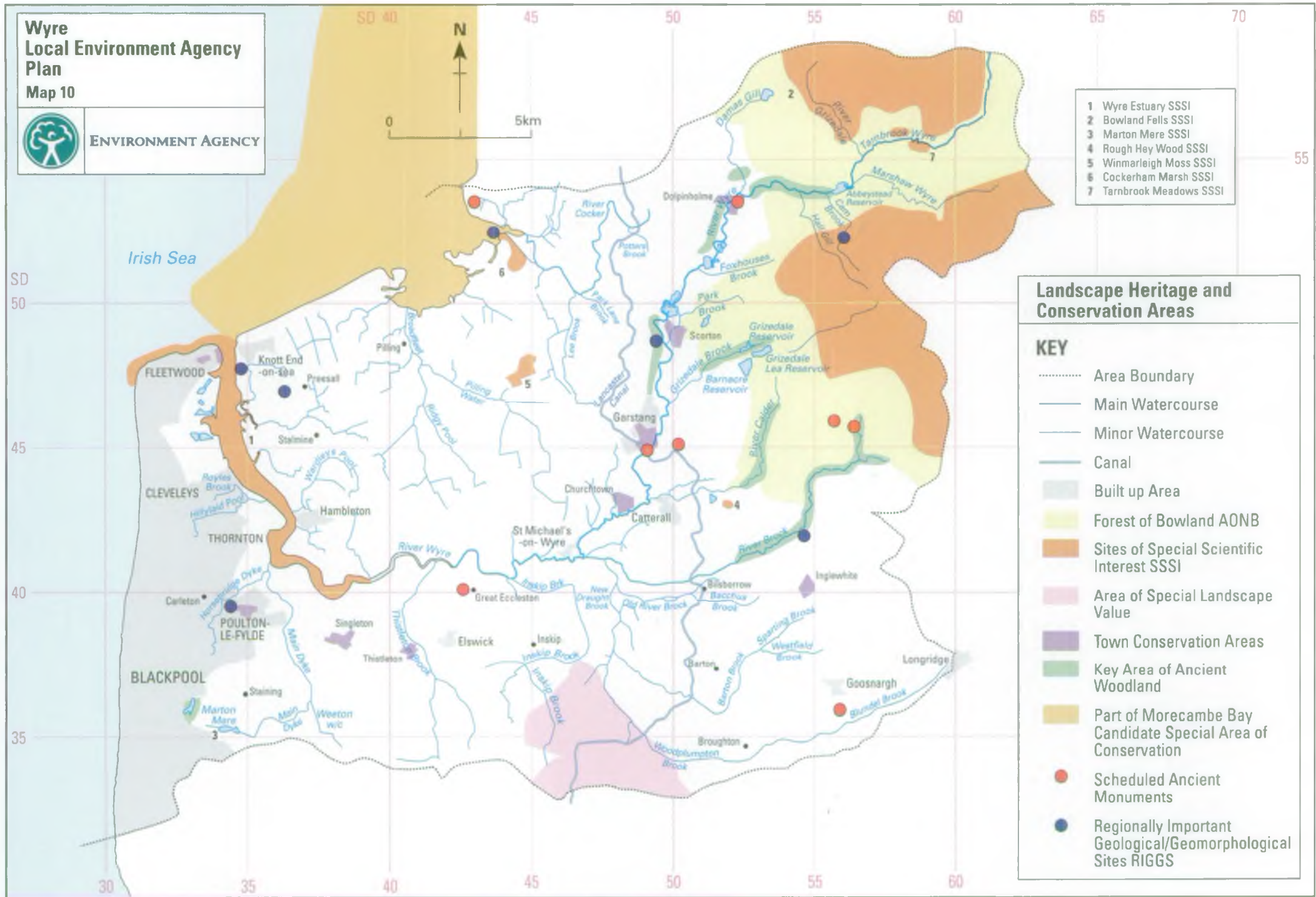


**Wyre  
Local Environment Agency  
Plan  
Map 10**



ENVIRONMENT AGENCY

0 5km



- 1 Wyre Estuary SSSI
- 2 Bowland Fells SSSI
- 3 Marton Mere SSSI
- 4 Rough Hey Wood SSSI
- 5 Winmarleigh Moss SSSI
- 6 Cockerham Marsh SSSI
- 7 Tarnbrook Meadows SSSI

**Landscape Heritage and Conservation Areas**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Forest of Bowland AONB
- Sites of Special Scientific Interest SSSI
- Area of Special Landscape Value
- Town Conservation Areas
- Key Area of Ancient Woodland
- Part of Morecambe Bay Candidate Special Area of Conservation
- Scheduled Ancient Monuments
- Regionally Important Geological/Geomorphological Sites RIGGS

Lancashire also has one of the lowest levels of woodland cover in the country. Within the Wyre study area the most noticeable woodlands are linear broadleaved woods associated with the incised valleys on the upper reaches of the River Wyre and River Calder. The upper reaches of the River Wyre and its tributaries have high conservation and visual character value. These reaches should be conserved. On the middle and lower reaches agricultural and river management works and poor woodland management, including excessive grazing, have resulted in degradation of woodlands, including ancient woodlands. Restoration strategies should be applied to middle and lower reaches of these watercourses. The River Wyre tree strategy being promoted by the Agency seeks to address this issue.

Lack of attention to the built heritage and lack of knowledge of the potential archaeological interest in many sites including marine and waterlogged, continues to result in damage to and loss of the cultural heritage of the area due to lack of awareness, development pressure, neglect and vandalism. Historic landscapes and important geological sites are similarly being lost. Accurate recording of the built heritage is required. The Cockerham Baulks is an old fishing station located by Cockerham Lighthouse. This station was used by monks until 1937 when fishing rights were bought out by Lancashire River Board. Watching briefs, trial excavations and feasibility studies into the potential for discovery of currently unknown sites are required.

FWAG and ADAS in particular have highlighted issues of damage to riverbanks through overgrazing; loss of hedgerows and ponds in the Fylde area; the need for drystone wall restoration; the loss of haymeadows and other associated issues. Amongst other initiatives, restoration and conservation is being addressed by ADAS under the Countryside Stewardship scheme.

### **Issues arising:**

- Issue 2:           The protection and restoration of existing and degraded important habitat types and their associated species, to protect and increase biodiversity.**
- Issue 21:         Loss of water power mills as a landscape heritage feature.**

## 2.1.5 Ecology

### General

The Environment Agency has a duty under the Water Resources Act 1991 to further and enhance the conservation of landscape and wildlife within the aquatic habitat and its surrounding land. This duty is carried out by the Environment Agency as a part of all its activities.

The duty covers both sites of national importance (designated under the Wildlife and Countryside Act 1981) and the wider catchment areas.

Proposals for the designation of sites, e.g. Sites of Special Scientific Interest (SSSIs) are the responsibility of English Nature.

English Nature are a statutory consultee to both the Environment Agency and the Local Planning Authority where works or developments may impact upon designated sites.

### Local Perspective

The River Wyre catchment encompasses a wide variety of habitats, and this is reflected in the associated rich wildlife resource. At the top of the catchment open heather moorland and rough sheep pasture characterise the fellslopes of the Forest of Bowland. The lower foothills of improved pasture become increasingly intensively farmed with progression westwards beyond the M6 corridor. Below St Michael's, the tidal stretch of the Wyre then opens out into an Estuary of mudflats and saltmarsh.

The Forest of Bowland is designated an Area of Outstanding Natural Beauty (AONB) see map 10. Much of it is also SSSI, designated for its blanket bog and heather moorland, and this includes the fell slopes of the Tarnbrook and Marshaw Wyre. Bracken spraying on steep slopes, with no subsequent management can result in erosion. Moorland slipping and the drainage of wet flushes has resulted in the degradation of blanket bog. It is also a Special Protection Area (SPA) for its populations of merlin, hen harrier and peregrine. From a national perspective, such managed heather moorland is a diminishing resource, hence this is an area of great importance. However, the intensity of historical management has, in places, had an adverse effect on this community resulting in an increased spread of purple moor grass, the drying out of wet acid flushes, and increased siltation of the upland watercourses.

The Marshaw Wyre and the Tarnbrook Wyre meet above Abbeystead Reservoir. This reservoir is a County Biological Heritage Site designated for its breeding bird population, and the habitat mosaics of this diverse semi-natural habitat.

Below the reservoir the southwestern foothills are generally used as improved sheep pasture, and dissected by steep-sided valleys known as Gills, or Cloughs generally associated with Ancient Woodland with many designated as County Biological Heritage Sites. The value and current condition of this woodland is discussed more fully in the Wyre Tree Strategy, but in general it is suffering from over-intensive grazing, with an adverse impact on the associated ground flora. Two significant ungrazed woodlands are the valleys of the Brock and the Calder, major tributaries of the Wyre.

West of the M6 corridor, the area north of the Wyre is predominantly peat mossland, although it is now intensively farmed and drained. Within this area, the lowland raised mire of Winmarleigh Moss SSSI is important as the largest remaining example of this habitat found in Lancashire. This acid bog site supports a characteristic flora and associated invertebrate population. Such habitat was formerly extensive on the coastal plains of Lancashire but is now rare, both countywide and nationally, due to peat extraction and agricultural reclamation. These communities are reliant on ground water levels, and there is concern that the long history of land-drainage and improvements is having an adverse effect, with a gradual drying out, and subsequent loss of the bog flora. Winmarleigh Moss is scheduled as the subject for a Water Level Management Plan in 1997, which aims to identify management practices to accommodate both the needs of farming, and of conservation.

The area south of the River Wyre is rich intensively farmed pastureland, with a network of small drainage watercourses. Within this area, Carr House Green Common is an important island of semi-natural habitat area of marshy grassland. It is designated as a County Biological Heritage Site for its mosaic of different plant species, and is used by barnowls and waders such as snipe and curlew.



Barn Owls have suffered a 70% decrease in numbers over the last 50 years, attributed to the loss of habitat and breeding sites. 80% of the population is found within 2km of major river systems on low-lying land. The coastal mosslands of Lancashire form a link between existing strongholds of Shropshire and the Borders. As with the peat mosslands, this area is dependant on sensitive management of the surrounding land.

The whole length of the Lancaster Canal within Lancashire is designated a County Biological Heritage Site for its floral communities and forms an important wildlife corridor from Preston up to Lancaster.

Marton Mere SSSI on the edge of Blackpool is a freshwater lake occupying a glacial kettlehole. It now supports significant populations of breeding and migrant wildfowl.

The Wyre Estuary SSSI starts at above Shard Bridge, and extends out to the coast where the Wyre discharges into Morecambe Bay. The Estuary forms part of the Morecambe Bay Wetland of International Importance - a Ramsar site, and is proposed as a Special Area for Conservation recognising its bird populations. These designations recognise the importance of the area for migratory and breeding waders and wildfowl. The recent designation of the Estuary SSSI now encompasses the Barnaby's Sands Marsh and Burrows Marsh SSSI, designated for their ungrazed saltmarsh, with the associated flora, the largest areas of such habitat in the County.

### **Issues Arising:**

- Issue 1:           Loss of Flyde Pond habitat due to infilling and development.**
- Issue 2:           The protection and restoration of existing and degraded important habitat types and their associated species, to protect and increase biodiversity.**
- Issue 12:          Loss of aquatic species diversity and flooding problems due to the impact of highway drainage from M6 (Junctions 32-33) and M55 Motorways.**
- Issue 21:          Loss of water power mills as a landscape heritage feature.**

## 2.1.6 Water Abstraction

### General

Groundwater and surface water together make up the water resources of the catchment. This resource is used as a source of potable water or for other uses. However, the resources must be protected in terms of quality and quantity by achieving a balance between the rights of abstractors and other lawful users of the waters and the needs of the environment.

Where there are valid requirements for water abstraction and competition with other river uses there is a need to strike a balance between the various interests to secure optimum development of resources. This must be undertaken within a framework to ensure protection of the natural environment.

Managing water resources is achieved through abstraction licences which specify the quantities of water which may be abstracted. Abstractors are charged for the right to use water in accordance with a tariff based on factors such as licensed quantity, source, season of abstraction and category of use.

### Water resources strategic aims:

- To plan for the sustainable development of water resources, develop criteria to assess the reasonable needs of abstractors and of the environment.
- To collect, validate and store hydrometric data and water environment data in order to assess water resources.
- To apply a nationally consistent approach to abstraction licence determination, charging, policy and enforcement.
- To implement a consistent approach to the resolution of inherent problems caused by overabstractions resulting in low flows in Calder, Tarnbrook, Grizedale, Wyre).
- To work with other functions and external bodies to protect the quality of our water resources.

It is the Agency's responsibility to assess, plan and conserve water resources. The Environment Act 1991 describes the duty to ensure that measures are taken towards the conservation, redistribution, augmentation and proper use of water resources, whilst at the same time conserving and enhancing the environment. The act requires the agency to make arrangements with water and sewerage undertakers and statutory water companies to secure the proper management and operation of water resources and associated work.

In order to achieve this, the Agency will continue to ensure the effective management of the resource by the development and implementation of regional water resources strategies and the implementation of licensing policies.

### Local Perspective

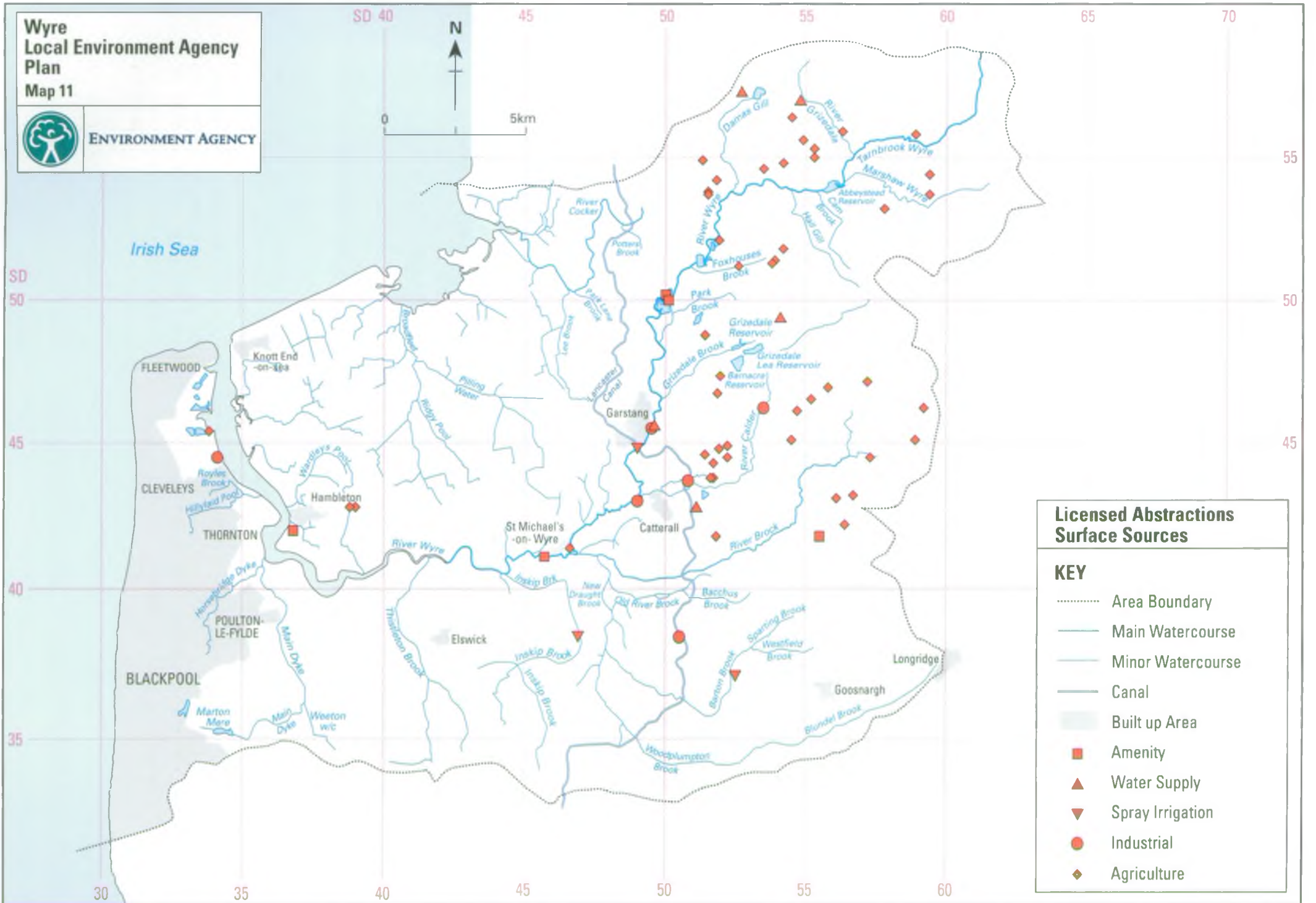
There is limited non-potable abstraction from the River Wyre and its tributaries for small scale industry, agriculture and fish farming purposes. There is one major tidal abstraction from the Wyre Estuary by ICI for industrial - cooling purposes at Thornton - Cleveleys. (See map 11)

The Lancaster canal flows through the Wyre area in the north/south direction with abstraction from the River Calder at Catterall to top up the canal. This intake has the ability to abstract the total flow of the river causing critical low flow conditions in the Calder downstream of the point of abstraction.

**Wyre  
Local Environment Agency  
Plan  
Map 11**



ENVIRONMENT AGENCY



**Licensed Abstractions  
Surface Sources**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Amenity
- ▲ Water Supply
- ▼ Spray Irrigation
- Industrial
- ◆ Agriculture

Water Use	Surface Water Annual Licensed Quantities	
	%	Megalitres (MI)
Domestic/Agriculture	0.3	462
Industrial	19.8	25,680
Spray Irrigation	0.0	6
Amenity	0.6	747
Public Water Supply	79.3	102,935
	Total	129,830

### Groundwater Abstractions

Groundwater may be abstracted from water bearing strata (aquifers) by means of wells or boreholes, or by making use of naturally occurring springs. (See map 12)

The Wyre catchment is underlain by the major sandstone aquifer of the Fylde (see map 15 and 5 schematic cross section) which is exploited extensively by boreholes for public water supply. The aquifer generally contains high quality groundwater except in the vicinity of the Wyre Estuary where some saline intrusion may occur.

The area has numerous small sources which are used for domestic and agricultural purposes.

The only major non-potable abstraction from the Fylde aquifer in the area of the Wyre catchment is by ICI who have a group of sources in the Pilling area used for industrial purposes.

It has been identified that the Fylde aquifer is under stress and an embargo has been imposed on any additional abstraction from the Fylde aquifer depends on the findings of a Groundwater Resources study.

Water Use	Groundwater Annual Licensed Quantities	
	%	Megalitres (MI)
Domestic/Agriculture	0.3	71
Industrial	18.6	5691
Spray Irrigation	0.1	30
Amenity	-----	-----
Public Water Supply	81.0	24751
	Total	30543

### Groundwater

The Agency seeks to ensure the protection of groundwater resources by means of the Agency's Groundwater Protection Policy (G.P.P.). It considers both source and resource protection, i.e. protection of the area which drains to the abstraction point and protection for the total area of the aquifer irrespective of abstractions.

### Groundwater resource Objectives

In dealing with new applications involving groundwater abstractions, the following objectives will be pursued:

- To manage resources to safeguard existing water supplies.
- To manage groundwater resources where possible to meet future demand.

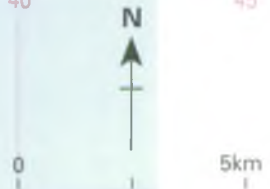


Wyre  
Local Environment Agency  
Plan  
Map 12



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



SD  
50

55

50

45

45

40

35

30 35 40 45 50 55 60

Irish Sea

FLEETWOOD

Knott End  
-on-Sea

CLEVELEYS

THORNTON

BLACKPOOL

POULTON-  
LE-FYLDE

Hambledon

Elswick

St Michael's  
-on-Wyre

Garstang

Catterall

Longridge

Goosnargh

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**Licensed Abstractions  
Groundwater Sources**

**KEY**

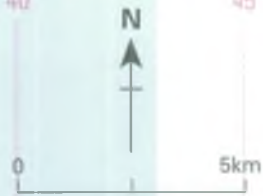
- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- ▲ Water Supply
- ▼ Spray Irrigation
- Industrial
- ◆ Agricultural

Wyre  
Local Environment Agency  
Plan  
Map 13



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



Irish Sea

SD

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**Simplified Solid Geology**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Permo-Triassic:
  - Mercia Mudstone - non aquifer
  - Sherwood Sandstone - major aquifer
- Carboniferous:
  - Namurian (Millstone Grit Series) - minor aquifer
  - Dinantian (Limestone Series) - minor aquifer



**Wyre  
Local Environment  
Agency  
Plan  
Map 14**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



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Irish Sea

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**Simplified Superficial  
Deposit**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Wind Blown Sand -minor aquifer
- Alluvium -minor aquifer
- Peat -minor aquifer
- Glacial Sand and Gravel -minor aquifer
- Till (BoulderClay) -non aquifer
- Drift Cover Absent

FLEETWOOD

Knott End -on-Sea

CLEVELEYS

THORNTON

BLACKPOOL

POULTON-LE-FYLDE

Hambleton

St Michael's -on- Wyre

Catterall

Elswick

Longridge

Goosnargh

Garstang

Spink Hill

Bacchus

Barnon

Spouting

Westfield

Bundel

Woodhouse

Woodhouse

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River Cookley

Possley Brook

Lea Brook

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- To protect aquifers from over-commitment and ensure groundwater abstraction does not have an unacceptable effect on surface waters and related environmental interests.
- To ensure the best utilisation of water resources and related environmental interests.

## Groundwater protection Objectives

Groundwater is a vital resource and under particular threat from the effects of human activity. Once polluted groundwater is often difficult and very expensive to remediate. Therefore preventing groundwater contamination is a major objective.

## Public Water Supply

The groundwater and surface waters of the Wyre catchment are primarily used for public water supply mainly to supply the Fylde and north Preston areas. The supply of potable water is the sole responsibility of North West Water Ltd.

The earliest developments for public water supply were surface water abstractions from the Upper Wyre (Tarnbrook Wyre) using catchwaters and stream intakes. These feed Damas Gill reservoir, which is treated and supplies the Lancaster area. The intakes catch the whole flow of the various tributaries. Barnacre reservoirs built in the late 1800's, with intakes similarly taking the whole flow of the River Calder and Grizedale Brook with no compensation or bypass at low/medium flows.

The major water supply network in the Wyre catchment is the Lancashire Conjunctive Use Scheme (LCUS), which was commissioned in the mid/late 1970s.

The groundwater component of the LCUS is derived from the Permo-Triassic Sherwood Sandstones of the Fylde aquifer, bounded by older Carboniferous strata to the east, and overlain by low permeability Mercia Mudstones to the west.

The Carboniferous strata, forming the high ground on which the River Wyre rises, comprises predominantly mudstones and sandstones with some limestones (see map 13). Faulting of the strata suggests that direct hydraulic continuity exists between the Carboniferous and the Permo-Triassic aquifer, and in the investigations in the early 1970's it was assumed that the majority of the recharge to the aquifer was derived from this source. However the presence of low permeability Manchester Marls at the base of the Permo-Triassic sequence is likely to limit such flow, particularly south of Garstang. In the west, high groundwater salinities are present, indicating no significant groundwater flow occurs westward under the mudstones.

The Fylde aquifer is mainly covered by drift deposits, comprising glacial silts, sands, gravels and boulder clay, the latter tending to limit rainfall infiltration (see map 14). However the deposits are highly variable in composition and disposition. Furthermore there is known to be hydraulic continuity with stretches of various watercourses which cross the aquifer, either directly or via permeable alluvial deposits.

The LCUS comprises a number of diverse sources, both within and outside the Wyre catchment as listed below:

Stocks Reservoir (Ribble catchment)  
 Barnacre Reservoir, with associated intakes  
 River abstraction from the River Wyre at Garstang  
 River abstraction from River Lune transfer to River Wyre  
 Groundwater abstraction from the Fylde aquifer

The principle of the LCUS is that by operating as a single unit, greater yields and average supplies can be obtained from the separate components. The supplies from Stocks and Barnacre reservoirs by gravity are the principal sources for the network with back-up from the boreholes, particularly for short periods of intensive use. The river abstractions can be used to "rest" the reservoirs early/late in the season when they respond to rainfall.

When there is insufficient water in the Wyre to satisfy abstraction requirements, water may be available in the Lune and can be transferred via pipeline to the Wyre at Abbeystead for re-abstraction at Garstang. There are residual flow conditions on both the Lune and the Wyre to protect the rivers.

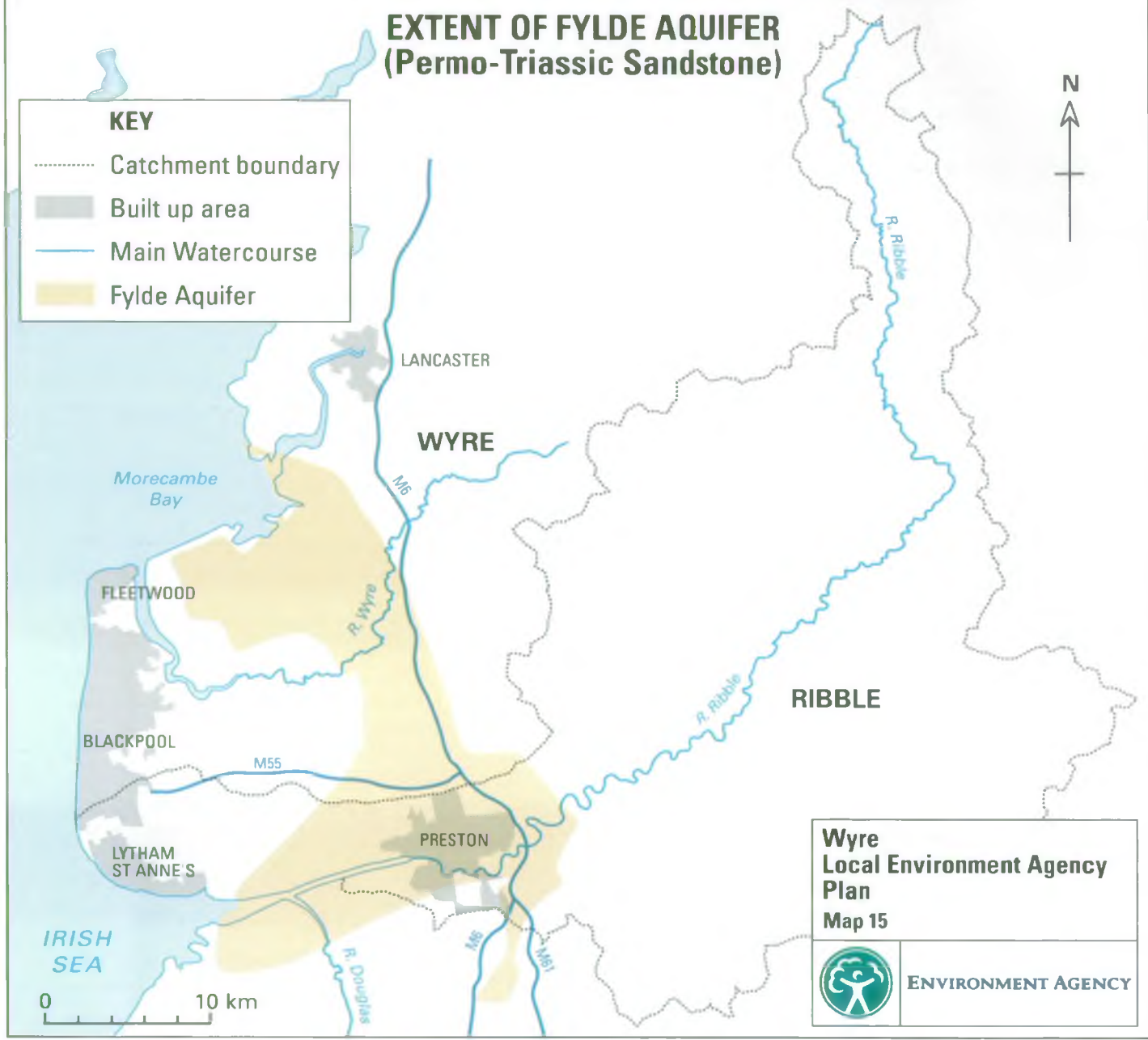
Augmentation conditions on the groundwater licences exist where hydraulic continuity has a detrimental effect on flows in the Wyre and Calder.



## EXTENT OF FYLDE AQUIFER (Permo-Triassic Sandstone)

**KEY**

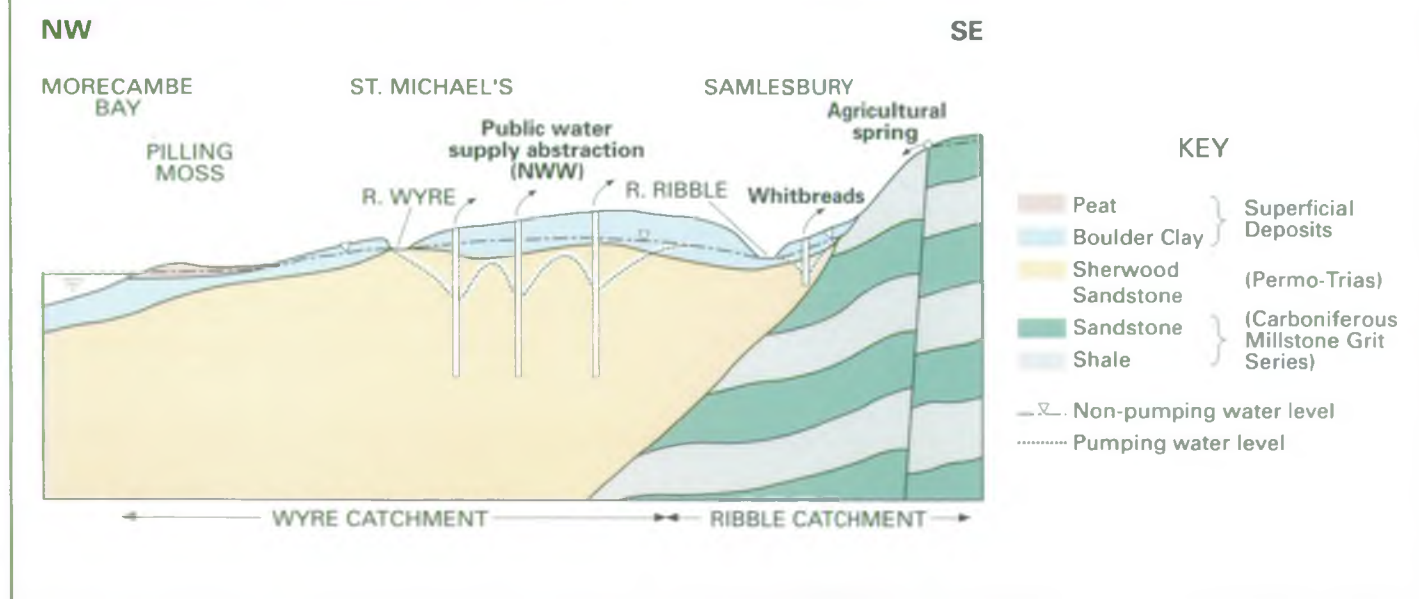
- ..... Catchment boundary
- Built up area
- Main Watercourse
- Fylde Aquifer



**Wyre  
Local Environment Agency  
Plan  
Map 15**

ENVIRONMENT AGENCY

### FYLDE AQUIFER – SCHEMATIC CROSS SECTION (Showing relationship with Ribble and Wyre catchments)



There is an additional groundwater level condition on the Broughton licences to protect the aquifer. This condition based on T74 borehole protects BNFL, in the Ribble catchment, from NWW abstractions.

## **Environmental Considerations**

The Agency has a role in implementing the European Habitats Directive. The Directive's objective is to maintain, and, where necessary, restore favourable conservation status in respect of designated areas, which comprise Special protection Areas (SPAs), and Special Areas of Conservation (SACs), and Sites of Special Scientific Interest (SSSIs).

There will be a requirement for the Agency to review abstraction licences affecting designated sites between 1998 and 2004, and ensure that it uses its powers to contribute to conservation objectives of these sites.

There are a variety of pressures on the plant and animals of the environment. It is essential to undertake monitoring to assess the current state of ecosystems in order to know how to best direct resources, and assess the impact or potential future impacts of water abstractions. This will help to support the protection of wetlands by achieving a better understanding between the interaction of groundwater abstractions on surface water wetlands and low flows.

An integrated approach to protecting and enhancing biodiversity is required by reducing pollution, improving habitats and maintaining river flows within the natural carrying capacity of ecosystems

## **Future Demand**

Water is one of our most valuable natural resources, everybody should ensure that each drop is used wisely and not wasted. There are increasing pressures on the water environment, from the water companies for public supply, agriculture and industry. It is the role of the Environment Agency to ensure that the balance between the needs of the natural water environment and the demands for water are achieved and maintained.

This increase in pressure on the water environment has resulted in the need to promote demand management. In addition there is the requirement to promote the reduction of leakage from distribution systems by water companies and waste of water by industry and in the home.

Future increases in urban development area and industrial activity in the catchment will have a significant impact on future demands for water. The Agency is helping to promote water efficiency and waste minimisation throughout the area.

If we can reduce the 'waste' of water and use it more efficiently at home and in the work place there could be a reduction in the amount of water abstracted from groundwater, rivers and reservoirs. This is particularly important during times of drought when the rivers are under particular pressure from naturally lower flows and higher demands during the hot weather.

It is essential that everything is done to reduce the level of water lost through leaking pipes. North West Water are committed to reducing total leakage by 250 Ml/d (millions of litres per day) company wide by 1999/2000. This is similar to the quantities abstracted through the Lune - Wyre transfer, as part of the LCUS.

Climate change may also have an effect on future demand for water due to increased temperatures and changes in rainfall patterns.

The successful implementation of demand management will ensure the proper use of the water environment and the protection of the natural water environment and the wildlife which lives there.

## **Issues Arising:**

- Issue 5:           **Artificially induced low flows within the catchment.**
- Issue 17:       **Waste minimisation and efficient water use.**

## **2.1.7 Urban Development**

### **General**

The Environment Agency is taking a pro-active role in the land-use planning system. This is in terms of guidance and advice to Local Planning Authorities (LPAs) and developers on matters concerning air quality, the water environment and waste management. The aim is to ensure future development is sustainable and land use change is guided and implemented within the overall aim of protecting and enhancing the whole environment.

Past development has had a major influence on shaping the area and the planning system plays an important role in guiding the general location of land for future homes, businesses, shops and leisure facilities. New development has to be carefully considered, to recognise both potential adverse effects, as well as benefits, change can have on the environment.

The Agency seeks to assess the likely impact of proposed development and we pursue our aims and objectives via the planning consultation process. The final determination of decisions on planning matters rest with the LPAs, however, national planning policy guidelines have advised on the need to consider Agency concerns when formulating a decision. Local Environment Agency Plans are an important part of the on-going dialogue with LPAs to foster partnerships and identify issues, where environmental problems and potentials can be most actively pursued.

As a statutory consultee under planning legislation, for both development plan preparation and certain types of planning application, our advisory role provides LPAs with information to assess how development will impact on the environment. It also advises developers of any Agency licences and consents which may be necessary, independent of any planning approval.

We are involved in all levels of the planning process. We are consulted on National Legislation and Guidance, and Regional Planning Guidance. We are also consulted on LPA Development plans, Structure Plans, Local Plans, Minerals and Waste Plans. We support policies which reflect our interests and highlight constraints to allocations which could have a detrimental impact on the environment if not properly designed and planned. The link between Development Plans and LEAPS is most important. Section 54a of the Town and Country Planning Act 1990 indicates that decisions on development proposals should be made in accordance with development plans unless material considerations indicate otherwise. The recognition of LEAPS in development plan preparation is essential, as certain LEAP issues will have an impact on future land use planning.

### **Local Perspective - Links Between LEAPs and Land Use Planning**

Planning policy within the Plan area is guided by Regional Planning Guidance for the North West (RPG 13), April 1996. This provides the strategic planning framework for the Region, recognising development pressures and the development framework for such issues as the environment, economy and housing etc. Paragraph 4.20 states.

"The Environment Agency is currently producing a series of Local Environment Agency Plans, LEAPs, which are intended to bring together the management of all air, land and water based interests. LEAPs are intended to provide an input to development plan policy formulation on issues such as waste, water and sewerage infrastructure, location of new facilities, waste disposal, flood plain and sea defence planning. Planning authorities should have regard to LEAPs when formulating development plan policy".

The plan area in planning terms is administered by a number of LPAs (see map 16). These are:

Lancashire County Council  
Blackpool Borough Council  
Fylde Borough Council  
Preston Borough Council  
Wyre Borough Council  
Lancaster City Council

Each Borough and City Council are in the process of preparing, or have in place, a Borough-wide development plan.

**Wyre  
Local Environment Agency  
Plan  
Map 16**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



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Irish Sea

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**LANCASTER**

**WYRE**

**FYLDE**

**PRESTON**

FLEETWOOD

Knott End-on-Sea

CLEVELEYS

THORNTON

BLACKPOOL

BLACKPOOL

POULTON-LE-FYLDE

Hambleton

Elswick

St Michael's-on-Wyre

Garstang

Goosnargh

Longridge

River Cocker

Pottery Brook

Pottery Water

Grizedale Brook

Barnacre Reservoir

River Calder

River Wyre

Winkip Brook

Inskip Brook

Wendhampton Brook

River Wyre

Foxhouses Brook

Park Brook

Grizedale Reservoir

Grizedale Lea Reservoir

River Calder

River Brook

Blackpool Brook

Sparling Brook

Westheal Brook

Bundel Brook

Woodhampton Brook

Marshaw Wyre

Dartan Quay

River Grindale

Abbeydale Reservoir

Valley Brook

Grizedale Reservoir

Grizedale Lea Reservoir

Grizedale Reservoir

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**Local Authority Boundaries**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- - - Council Boundary



The Lancashire Structure Plan sets out the County's strategic commitment to economic growth by seeking to:

- Create a first class communication link to the rest of the UK and beyond.
- Protect and manage the best of Lancashire's natural and built environment and improving the rest.
- Maximise the quality and location of new business sites.

The Councils within the catchment are considered to be, in Structure Plan terms within the Western part of the County. This area has seen consistent population growth whereas East Lancashire has experienced decline.

Within the catchment, there is pressure for growth and development. Continuing increases in personal mobility, advances in telecommunication technology, peoples perception of urban and rural life and the declining importance of agricultural land are all putting the countryside under pressure from demand generated in the towns. However, this can lead to a loss of much needed investment and there are economic problems in inner Blackpool and parts of the town is targeted for economic regeneration.

The Agency supports the intentions of Regional Planning Guidance and development plan policies which seek to protect and enhance the environment. To help the LPAs formulate development plan policy and minimise the potential for development to increase flood risk, the Agency is carrying out surveys of floodplain, washlands and other land liable to flood and establish the effects of increased run-off on existing development. Once completed these surveys will be passed to the LPAs to ensure planning decisions take account of flood risk issues.

In addition, a number of groundwater vulnerability maps have been produced. These maps give a local perspective to national groundwater policy. District wide indicative maps have been produced for some LPAs in the catchment. HMSO are currently printing Groundwater Vulnerability Maps on a wider scale. These maps are intended to increase awareness of those places where groundwater is most at risk. Those responsible for the planning of land will find them useful in learning about the potential impact development could have on groundwater resources and quality.

Table 1 later in this section indicates the current state of development plan preparation within the area. The table highlights LPA policies which protect our interests. There will be a further opportunity for the LPAs to highlight designations which will support actions in this LEAP and potential areas for enhancement.

Close integration of environmental management and land use planning is considered an essential element of Agenda 21, the blueprint for sustainable development that was launched at the world Summit held in Rio de Janeiro in June 1992. Many LPAs are now preparing Local Agenda 21 documents and Environmental Audits and the Agency will assist, where appropriate, to try and ensure decisions made in the planning field meets the needs of the present without compromising the ability of future generations to meet their own needs. Change and development are necessary but such change should be accommodated in ways which maintain and enhance the distinctive character, quality and future viability of town and country.

For the above reasons, the Agency will seek to ensure the following policy objectives will be translated into land-use planning policy.

## **Development Policy Objectives**

### **Flood Defence**

To discourage new buildings and land raising in areas at risk from flooding or where development could cause flooding elsewhere:

- by ensuring new development is not at risk from flooding and does not put other areas at risk from increased rates and volumes of surface water run-off;
- by encouraging continuous unobstructed areas adjacent to the watercourse to ensure access for essential maintenance or flood flows.
- by highlighting where surface water storage or regulation may be necessary for catchments where increased run off rates and volume could cause or exacerbate flooding problems.

## **Water Quality**

- by ensuring new development complies with the Policy and Practice for the protection of Groundwater;
- by ensuring new development is served by satisfactory arrangements for the disposal of foul sewage, trade effluent and contaminated surface water;
- by encouraging, where there are sewage treatment capacity problems, new development is phased to coincide with improved infrastructure;
- by ensuring appropriate agricultural development complies with the Control of Pollution (Silage, Slurry, Agricultural Fuel Oil) Regulations 1991 and the MAFF Codes of Good Agricultural Practice for the Protection of water, soil and air;
- by ensuring leachate and drainage is controlled, treated and monitored from contaminated land sites.
- by ensuring surface water disposal systems are protected and wrong connections are avoided.

## **Water Resources**

To protect and manage the amount of surface water and groundwater resources to achieve the right balance between the needs of the environment and those of abstractors:

- by encouraging the management of surface water run-off (as far as practicable) be treated at source on all new developments through the use of swales, wetlands, soakaways, permeable pavements and roadways;
- by ensuring development can be or will be served by an adequate means of water supply which will not adversely affect existing user river flows, water quality, agriculture, fisheries, amenity or nature conservation.

## **Conservation and Enhancement of the Water Environment**

To protect, conserve and enhance areas of aquatic value and other important elements of the water environment:

- by highlighting the areas of the water environment, including river corridors which are, or have the potential to be of value;
- by discouraging development which would have an adverse impact on the nature conservation, landscape, heritage, fisheries, recreation or amenity value of watercourses, ponds, wetlands and the land physically and visually linked to them;
- by siting development away, wherever possible, from river corridors;
- by seeking to ensure development proposals protect and enhance on-site features and where development is accepted because of overriding economic or social considerations, mitigation and compensatory measures are provided so that there is no net loss of environmental value.

## **Waste Disposal, Mineral Operations and Contaminated Land Sites**

To ensure waste disposal, mineral operations and contaminated land redevelopment proposals do not cause pollution or harm to human health:

- by ensuring there are adequate measures which will be designed to control and monitor water pollution and landfill gas;
- by ensuring development complies with the Government's National Waste Management Strategy;
- by encouraging the re-use of contaminated land sites where the degree and nature of the contamination has been assessed and appropriate remediation measures incorporated.

## Air Quality

To protect air quality :

- by ensuring development will not have an adverse effect on air quality.

We will respond to planning applications and pre-enquiries using the above objectives to minimise adverse impacts and gain where appropriate, environmental improvement. We seek early discussions on development plan preparation and planning applications so we can provide useful information and advice. We believe this approach provides an opportunity and an insight into the plan area and local issues.

## ENVIRONMENT AGENCY INTERESTS AND LPA DEVELOPMENT PLAN POLICIES

December 1996  
Table 1

Development Plan Name & Stage of Preparation	LPA Development Plan Policies which protect our interests. (LPA Plan Policy reference or number shown)			
	Air, Water Quality & Water Resources	Flood Defence	Fisheries, Recreation & Conservation	Minerals, Waste Disposal & Contaminated Land
Lancashire CC Structure Plan awaiting adoption following modifications. November 1996.	Policy 6, 10	Policy 8, 15	Policy 7, 9, 13 Policy 54, 55	Policy 63, 66, 67, 68 Policy 69, 70, 76
Fylde BC. Adopted Local Plan. March 1994.	CF5	-	EP29	-
Preston BC. Deposit Local Plan Consultation ended November 1996.	R15 W6	R16	R6 15	-
Blackpool BC. Adopted Local Plan. May 1996.	E14, 22, 23	E13	E7, 8, 9, 15	C4
Lancaster CC. Draft Local Plan. Consultation ended December 1996.			E4, 16, 17, 18, 36	
Wyre BC. Deposit Local Plan Consultation ended August 1996.	ENV 18, 19 CIS 7	ENV 15, 16 ENV 17	ENV2, 5, 6, 7 TREC11	-

### Issues Arising:

Issue 20: Impacts of new development on flood defences.

## 2.1.8 Waste Management

### Background

The Agency has specific responsibility for the regulation of waste management activities including the supervision of licensed sites, exempt activities, carriers of controlled waste, movements of hazardous waste and shipments of imported waste.

Sites that treat, keep or dispose of waste need to have a waste management licence, unless they have a specific exemption. In recent years this licensing of such activities has become increasingly complex, particularly for landfill sites accepting a wide range of wastes.

Landfilling of wastes has potential for affecting the environment and having a detrimental impact on our health and our quality of life. To ensure that the effects of landfill sites are kept to a minimum many sites will require complex engineering work. The Agency has staff who can supply the necessary engineering expertise needed to provide effective assessment of these sites and to ensure that the site operator meets their responsibilities for safeguarding the environment, health and amenity.

The Agency maintains a public register of all licensed and registered exempt sites in addition to which comprehensive records of all known closed landfilling activities are held. The information in such registers is available for the public at the area office.

Data on closed landfill sites enables the Environment Agency to act as a consultee to Local Authorities, consultants, solicitors and members of the public for any potential threat posed by landfill gas escaping from a site. Closed landfill sites are classified as contaminated land and under forthcoming legislation the Environment Agency may be given responsibility for certain areas of contaminated land which will be deemed "special sites", closed landfill sites seem likely to fall into this category.

There is a certain amount of unauthorised activity within the Wyre catchment e.g. fly tipping. The Agency has a team of highly trained staff specifically dedicated to regulating such activities by applying the full range of legal powers available. Investigation of unauthorised activities may ultimately lead to prosecution of offenders through the courts.

The Agency also has responsibility for enforcing the more stringent legislation relating to hazardous waste and is responsible for the 'cradle to grave' monitoring of such material. Waste imports and exports to and from Lancashire are also regulated.

Anyone who carries waste as part of their business will need to register as a waste carrier. The Agency holds a register of all such carriers of waste and at present there are upwards of 2350 registered carriers in the Lancashire Area.

### Other Organisations Role In Waste

There are three other bodies with a specific remit for the controlling of waste related activities: Planning Authorities, the Environmental Health Department and Customs and Excise. In addition, the Waste Disposal Authority (currently Lancashire County Council, but this will be subject to change with the advent of Blackpool and Blackburn as Unitary Authorities) have responsibility for arranging for the disposal of waste collected from households.

The Planning Authority is responsible for granting planning permission - a pre-requisite for the Agency issuing a Waste Management Licence. This establishes the principal of using the land for waste management activities. This is usually a County Council issue as waste planning is of strategic importance within the County. However, scrap yards are dealt with by the Local Planning Authority. When the Unitary Authorities are established from 1st April 1998 it seem likely that they may adopt responsibility for strategic planning matters including waste management.

Environmental Health Departments also have some responsibility for waste management activities. They are involved in regulating the incineration of waste if the quantity of waste to be incinerated is between 50kg and one tonne per hour, otherwise it is the responsibility of the Environment Agency.

From 1st October 1996, Customs and Excise became more directly involved in waste management activities in that they are now responsible for collecting the new landfill tax which came into force in October 1996. This adds a tax burden to the cost of landfilling of between £2 and £7 per tonne depending on the type of waste concerned. It is the governments intention that such taxation will make landfilling wastes less attractive and so will encourage the production of less waste and the re-use or re-cycling of that waste which is produced.



Wyre  
Local Environment Agency  
Plan  
Map 17



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70

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Irish Sea

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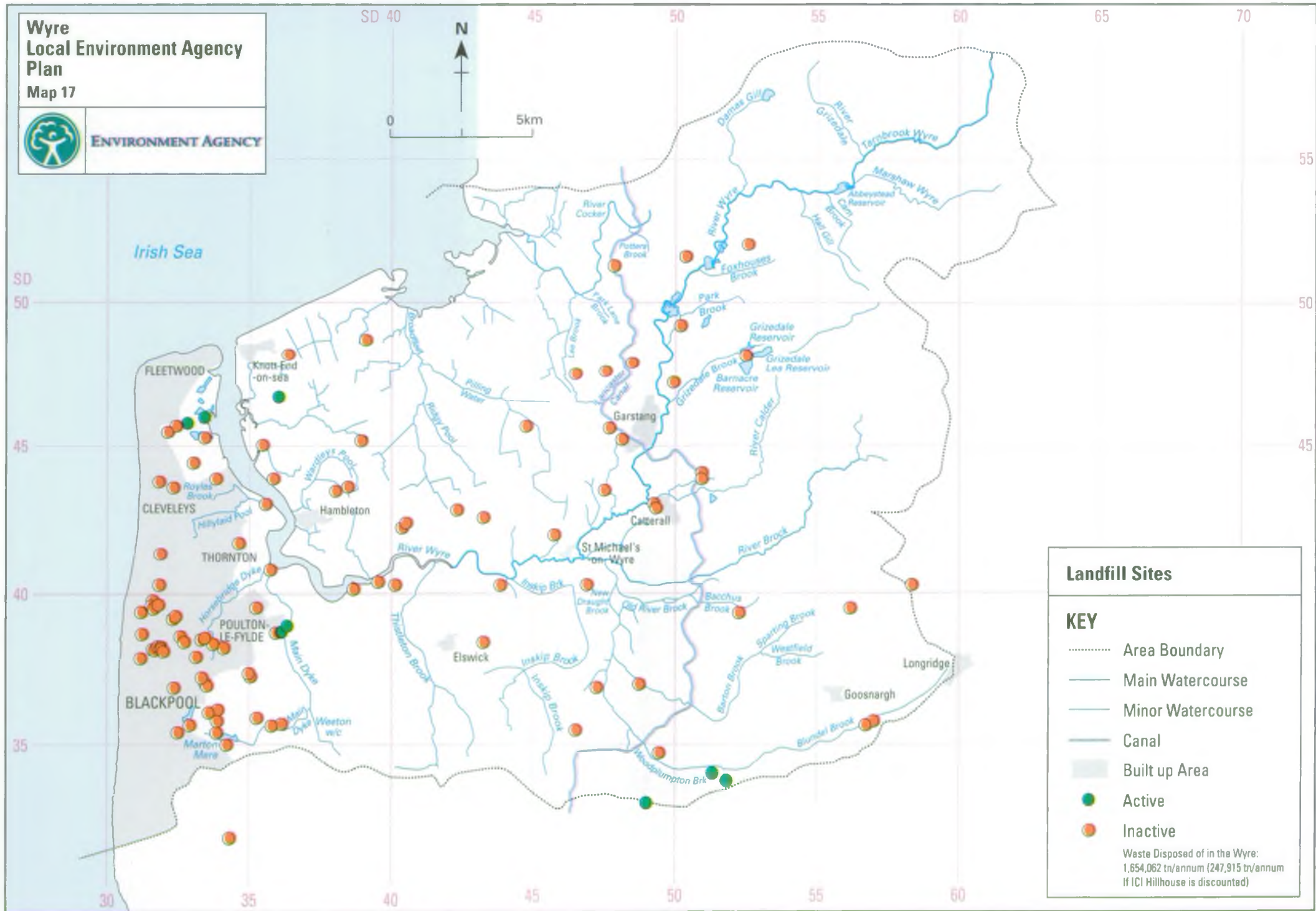
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Landfill Sites

KEY

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Active
- Inactive

Waste Disposed of in the Wyre:  
1,654,062 tn/annum (247,915 tn/annum  
if ICI Hillhouse is discounted)



## Waste Management Options

The Environment Agency seeks to ensure that best practise is used in all areas of waste management. At present 95% of waste within the area is sent to landfill potentially giving rise to the problems of pollution, land use and nuisance. Our aim is to ensure that, wherever feasible, more sustainable waste management practises are used and wherever practicable wastes should be diverted away from landfill.

The Agency recognises the approach outlined in the government's white paper 'Making Waste Work' which sets out guidance on the way that waste should be dealt with in the future. The white paper has four main objectives:-

- (i) To reduce the amount of waste that society produces.
- (ii) To make the best use of the waste that society produces.
- (iii) To minimise the risks of immediate and future environmental pollution and harm to human health.
- (iv) To increase the proportion of waste managed by options towards to top of the waste hierarchy.

## Monitoring of specific sites within the Wyre area

Map 17 shows the distribution of both active and inactive landfill sites within the Wyre area.

### Jameson Road landfill site, Fleetwood

Monitoring carried out at the site by the operator and the Environment Agency shows that landfill gas is present in off-site boreholes located to the north-west of the site. The quality of the surrounding groundwater is satisfactory. The ground water in the site is affected by the tidal Estuary of the River Wyre. This is particularly evident in the quality of the water in the boreholes located adjacent to the Estuary.

### ICI Hillhouse, Fleetwood

Monitoring carried out by the operator and the Environment Agency. Low concentrations of landfill gas, in boreholes, on the western boundary of the site were found. Monitoring of the groundwater shows the presence of significant hydrocarbon contamination and contamination by leachate.

### Kingscourt Developments, Poulton-le-Fylde

The results from monitoring at the site show that landfill gas generation at the site is minimal. Contamination of the groundwater by leachate is recorded in one borehole located adjacent to the main dyke, which flows along the southern boundary of the site. The quality of the water in the dyke downstream of the site is consistent generally with the quality of the water recorded upstream of the site and it shows the presence of some heavy metals.

### Bracewell Avenue, Poulton-le-Fylde

The operator has submitted only minimal monitoring data and is therefore in breach of the licence conditions. Low levels of landfill gas have been recorded in some of the boreholes at the site. Monitoring of groundwater by the Environment Agency has found levels of heavy metal and other inorganic contamination and some low levels of organic contamination. The quality of the water in the main dyke, which flows adjacent to the southern boundary of the site, shows higher levels of heavy metal contamination downstream of the site compared with upstream.

### Lightfoot Green landfill site (Bradleys), Preston

The site is now showing landfill gas in boreholes off-site on a regular basis. The operator has not submitted any monitoring results for surface or groundwater at the site since 1994 and therefore is not complying with the monitoring schedule. Monitoring of the Woodplumpton Brook by the Environment Agency shows that the quality of the water downstream of the site is consistent with the quality of the water upstream of the site.

## Special Waste

Special waste is that sub-set of waste which because of the hazards associated with it is considered to be so intractable to manage that it requires additional controls. These controls, a cradle to grave system of consignment notes, are implemented by the Special Waste Regulations 1996 and the Amendment Regulations 1996. These regulations have implemented in British law the EC Directive on hazardous waste (91/689/EEC).

The regulations require that, prior to the wastes movement, the consignors of special waste must complete a multi-part paper record or consignment note. This documentation describes the waste, where and how it is produced and where it is to be taken. Each person in the chain of consignor, carrier and manager of the special waste is required to complete part of the consignment note and to keep a copy of it for their records. A copy of the consignment note is sent to the Agency office in whose area the waste is to be managed. It is from the Agency's records that all information and movements of special waste are monitored.

## **Imported Waste**

In May 1994 the EC Regulation (259/93) on movements within, into and out of the European Community was implemented. This was further reinforced in UK law with the Transfrontier Shipment of Waste Regulations 1994.

International trade in waste has been common place for many years. Lancashire has three active ports at Heysham, Fleetwood and Glasson Dock and all have been known to handle waste. Of the waste imported through these ports some remain in Lancashire for treatment or disposal and some is transported on to other counties for subsequent treatment or disposal. Waste may also enter the UK at other ports and be transported onward to Lancashire for recovery or disposal.

The regulations are applicable to all wastes. The level of control is determined by the hazardous nature of the waste and whether the waste is for disposal or recovery. Waste for recovery is categorised using three lists: red, amber and green and, as the colour implies, green list waste going for recovery has the least controls. Amber list wastes and red list wastes require greater controls. These controls include financial provision and a commitment to return the waste to the notified in the event that the waste cannot be processed in accordance with the regulations. Further controls on the movement of waste have been imposed by the United Kingdom Management Plan for Imports and Exports of Waste that came into force on 1 June 1996.

## **Issues Arising:**

- Issue 15: Environmental impacts of Jameson Road Landfill site.**
- Issue 16: Impact of contaminated land on the environment.**
- Issue 17: Waste minimisation.**
- Issue 18: Landspreading of controlled wastes.**
- Issue 19: Environmental impacts of closed landfill sites.**

## 2.1.9 Area Drainage, Flooding and Flood Alleviation

### Local Perspective

The River Wyre originates in the Forest of Bowland where its headwater tributaries, Tarnbrook Wyre and Marshaw Wyre rise. Draining some 45,000 hectares in Central Lancashire, it is joined by two major tributaries, the Rivers Brock and Calder, before discharging to the sea at Fleetwood. The village of St. Michael's marks the limit of the tidal influence, and downstream of this point, the river is continuously embanked as it crosses the flat coastal plain. The main rivers and flood plain areas are shown on map 18.

The catchment has always been liable to flooding of a large area of the countryside, the most notable floods being recorded in the years 1866, 1898, 1927, 1936, 1980 and most recently in December 1983. In 1980 2000 hectares of land and over four hundred houses were affected. Following this flood, a comprehensive flood control scheme was undertaken and completed in 1989 at a total cost of £7.5 million. The scheme raised and strengthened flood embankments on the Wyre and its main tributaries from Scorton to Great Eccleston. It also included the construction of flood storage basins at Garstang and Catterall. The Garstang Flood Basin is controlled by gates within the river which are raised when necessary to control the flow downstream through Garstang and St. Michael's within safe limits.

The Catterall Flood Basin is located downstream of Garstang opposite St. Michael's. This basin is controlled by a gate set in the flood embankment which is lowered when the river approaches danger levels, allowing water to spill into a large area of non-residential land. The Garstang Basin has a capacity of 1.3 million cubic metres and Catterall Basin has a capacity of 1.7 million cubic metres.

In January 1995 both basins were brought into use for the first time to protect areas downstream of Garstang from flooding.

Tidal flooding has largely been prevented since the improvement of the Wyre Tidal Embankments carried out between 1970 and 1977. The storm surge tides of 1977, 1983 and 1990, which affected other parts of the Lancashire coast and Estuaries, were successfully contained by these improved defences.

The Pilling and Nateby drainage area relies almost entirely on Broadfleet Watercourse and its major tributaries for the disposal of surface water drainage. Extending to some 3,785 hectares in all, the Broadfleet catchment contains a large percentage of high grade agricultural land. Drainage of the area is entirely by gravity and suffers frequent interruptions due to tidal locking. Over the years this has given rise to quite serious flooding, particularly when periods of above average and prolonged rainfall have occurred in association with high tides. Major improvement works were undertaken on all main rivers within the Broadfleet system between 1966 and 1979. The completion of these works created a dramatic improvement in flood protection standards, and agricultural output from the area increased.

The area suffered serious flooding during the tidal storms in November 1977 with 5000 hectares of land and over 100 properties flooding due to the failure and over-topping of the sea defences from Knott End to Cockerham. A new length of sea defence was constructed from Fluke Hall to the Cocker Bridge to replace the original defences. The work, which involved the construction of 7.5km's of embankment and the reclamation of 260 hectares of marshland for agricultural use, commenced in June 1980 and was completed in the spring of 1982. The Knott End to Fluke Hall sea embankment was improved over two phases. The first phase commencing September 1984 to September 1985 and the second phase commencing April to October 1987.

### Operational Maintenance

The engineered river channels require constant maintenance such as weed cutting, tree removal, bank repair and shoal removal to ensure discharge of flood water thus maintaining defence standards. Repair of flood banks and related flow controls ensure that flood alleviation schemes can function as designed. In some instances, dredging will be required to maintain the carrying capacity of the channel. Careful consideration is given to environmental factors both prior to and during the period of undertaking maintenance.

### Flood Warning

Whilst an acceptable standard of flood protection is provided across the catchment, there will always be events that exceed the current defence levels.



**Wyre  
Local Environment Agency  
Plan  
Map 18**



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



0 5km

Irish Sea

SD  
50

45

40

35

55

50

45

**Main Rivers and Flood Plains**

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Sea Defence
- Tidal
- Main Rivers
- Floodplain and Defended Areas

FLEETWOOD

CLEVELEYS

THORNTON

BLACKPOOL

Knott End -on- Wyre

Hambleton

POULTON-LE-FYLDE

Marton Mere

Weeton w/c

River Wyre

Thameson Brook

Elswick

Inskip Brook

Inskip Brook

Garstang

Catterall

St Michael's -on- Wyre

Wesley Brook

New Draught Brook

Old River Brook

Bacchus Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Wesley Brook

Dartas Gill

River Grizedale

Isybrook Wyre

Marshaw Wyre

Robywood Reservoir

Wesley Brook

Wesley Brook

Wesley Brook

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Longridge

Gosnargh

Wesley Brook

Wesley Brook

Wesley Brook

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The Agency therefore operates a flood warning system covering the higher risk residential areas of Scorton, Garstang and St. Michael's, and also the coastal strip.

Weather conditions are constantly monitored and if flooding is likely warnings are issued to the Local Authorities and in the areas mentioned above warnings are also issued directly from the Agency to the residents at risk. Bulletins are also issued to the local radio and television companies and information is placed within a telephone information line called Floodcall (0645 881188).

### **Water Level Management Plans**

The Agency in co-operation with English Nature and landowners are pursuing a programme of producing joint management plans for SSSI's where drainage or the maintenance of specific water levels play a major role in supporting specific habitats. These are known as Water Level Management Plans.

Plans are being produced for the following sites within the plan area.

Cockerham Marsh  
Winmarleigh Moss

### **Climate Change**

Whilst the exact consequences of Climate Change are as yet unknown, the latest research suggests that the North of England whilst getting warmer will also get wetter and stormier. This suggests that the frequency of flooding may increase thus decreasing the standards of protection. The Agency can only monitor events as they arise and within a limited budget and against Regional priorities programme improvement works.

### **Issues Arising:**

**Issue 20:           Impacts of new development on flood defences.**

## 2.1.10 Effluent Disposal

### General

This use relates to the disposal of domestic and industrial effluents to controlled waters. Discharges of sewage or trade effluent to controlled waters require the consent or authorisation of the Agency. Consents granted under the provisions of the Water Resources Act 1991, or authorisations granted under the Environmental Protection Act 1990, normally include limits on the nature, volume and chemical composition of the effluent. Consents and authorisations are a means of ensuring that the effects of a discharge are limited to such an extent that water quality remains acceptable for relevant downstream uses. Many consents inherited by the Agency and by the former National Rivers Authority were set at levels too lax to meet the requirements of downstream uses. These are progressively being addressed within the prevailing restrictions, particularly concerning Water Companies expenditure.

The Agency seeks to ensure that authorisations and consents protect the uses of the receiving watercourses and also aim to eliminate pollution from discharges of dangerous substances.

Details of discharge consents are available from the Area office.

### Local Perspective

Discussion follows under three headings:

- Continuous effluents
- Intermittent discharges
- Diffuse sources

#### Continuous Effluents      Sewage

The major discharger to the Wyre Leap Area is North West Water Ltd (NWW) who have 14 Wastewater Treatment Works (WwTWs) in the Area (See map 19). Since the 1970s NWW have adopted a rationalisation policy whereby many smaller works have been abandoned and flows transferred to larger works. As a result Staining WwTW, which formerly discharged to Main Dyke, was abandoned in 1992 and more recently Poulton WwTW was abandoned as part of NWW's Fylde Coastal Waters Improvements Scheme in 1996.

The WwTWs in the catchment vary in size with the smallest WwTW treating a population equivalent of less than 250 and the largest WwTW at Fleetwood a population equivalent of more than 300,000 in summer.

The Fleetwood Marsh WwTW provides secondary treatment for wastewater flows that were previously discharged with only preliminary treatment via the Manchester Square, Anchorholme and Chatsworth Avenue pumping stations at Blackpool, Cleveleys and Fleetwood together with wastewater from the Poulton area which was previously discharged to the Wyre Estuary at Skippool. Wastewater generated in the Blackpool area is now transferred via a 12 km long tunnel flowing underneath the promenade to the new WwTW. Treated effluent is discharged via a 5 km pipeline to an area known as the Lune Deeps in Morecambe Bay. Whilst the completion of NWW's Coastal Improvements scheme including the provision of secondary treatment at Fleetwood Marsh WwTW has resulted in significant improvements in bathing water quality at Blackpool Central, Blackpool North, Bispham and Cleveleys, poor quality bathing water in the Blackpool South and Fleetwood areas was still detected during the summer of 1996. The causes of this are being jointly investigated by the Agency and NWW Ltd.

The largest inland WwTW is Garstang WwTW which discharges to the freshwater River Wyre near Catterall. In recent years there has been a significant deterioration in the quality of the River Wyre downstream of this discharge. The Agency is investigating this deterioration and intends to review this situation over the next few months. At this stage the deterioration is thought to be due to the 1995-1996 drought causing reduced river flows rather than due to a deterioration in effluent quality at the works.

Several other WwTWs have been identified as potentially having a significant impact on water quality.

**Wyre  
Local Environment Agency  
Plan  
Map 19**



ENVIRONMENT AGENCY

SD 40 45 50 55



0 5km

- |   |   |
|---|---|
| <span style="color: red;">■</span> <b>NWW WwTWs</b> | <span style="color: red;">▲</span> <b>TRADE EFFLUENTS</b>                 |
| 1. Dolphinholme                                     | 1. Ellel Quarry   |
| 2. Forton   | 2. NWW Barnacre WTP   |
| 3. Cockerham  | 3. Myerscough Quarry  |
| 4. Calder Vale                                      | 4. NWW Franklaw WTP   |
| 5. Garstang   | 5. North West Precast   |
| 6. Whittingham Cottages                             | 6. ICI Hillhouse Main Outfall   |
| 7. Barton   | 7. ICI Hillhouse Lagoon Outfall   |
| 8. Inskip   | 8. ICI Hillhouse MDI Lagoon Outfall                                       |
| 9. Elswick  | 9. ICI Hillhouse Rubber Chemicals Outfall                                 |
| 10. Weeton  | 10. ICI Hillhouse North Outfall   |
| 11. Hambleton                                       | <span style="color: green;">◆</span> <b>IPC Authorisation</b>             |
| 12. Pilling   | 1. ICI Hillhouse International  |
| 13. Preesall  | 2. AD Plastics  |
| 14. Fleetwood                                       | 3. Silverfield  |
|   | <span style="color: green;">●</span> <b>Radioactive Substance Licence</b> |
|   | Blackpool Victoria Hospital   |



**Effluent Disposal**

**KEY**

- ..... Area Boundary
  - Main Watercourse
  - Minor Watercourse
  - Canal
  - Built up Area
  - ◆ IPC Authorisation
  - Radioactive Substance licensed
- NWW Ltd WwTW**
- DWF < 100m<sup>3</sup>/day
  - DWF > 100-999m<sup>3</sup>/day
  - DWF > 1000-9999m<sup>3</sup>/day
  - DWF > 10,000m<sup>3</sup>/day
  - Private WwTWs (DWF < 100m<sup>3</sup>/day)
- COMBINED SEWER OVERFLOWS:**
- Unsatisfactory CSO(s)
  - Satisfactory CSO(s)
  - ▲ Trade Effluents



Pilling WwTW discharges poorly treated effluent to the tide-locked watercourse Broad Fleet. Secondary treatment/extension of the outfall is required to achieve compliance with the Urban Waste Water Treatment Directive. However, NWW have not been allocated funding to carry out improvements at this works until after the year 2000.

Hambleton WwTW discharges poorly treated effluent via Wardleys Creek to the Wyre Estuary. This discharge is responsible for poor aesthetics in a very high amenity area used as a marina. Again, secondary treatment is required to achieve compliance with the Urban Waste Water Treatment Directive. The Agency would like to see the abandonment of this works and transfer of wastewater to Fleetwood WwTW for secondary treatment.

Barton WwTW discharges secondary treated effluent to Barton Brook. Barton Brook downstream is presently failing to meet the required standards in the Freshwater Fisheries Directive. Intensive monitoring of the Barton Brook catchment has been initiated and a review of this data (water quality, fishery status and habitat) plus the identification of any further treatment requirements for this works is to be carried out during 1997.

Weeton WwTW and Forton WwTW presently produce high quality treated effluents. However, due to the small size of the receiving watercourses poor water quality is found downstream. The Agency is presently also carrying out intensive surveys in these catchments. The cause of the poor water quality may be related to other polluting inputs.

There are also a significant number of private sewage treatment works in the Wyre Area and septic tanks exist in parts of the area that are unsewered. The impact on the receiving waters from these works is generally of minor significance, although there are problems in areas where either a conglomeration of septic tank discharges or the lack of any proper treatment facilities at all, is contributing to poor water quality. The following areas are affected:

- Main Dyke below Singleton Village drain
- Top reach of River Cocker
- Old River Brock
- Halfpenny Lane. Longridge affecting Blundell Brook
- Mains Lane, Little Singleton affecting the lower reaches of Main Dyke
- Occupation Lane, Little Singleton affecting Wyre Estuary
- Bartle and Swill Brook affecting Swill Brook, a tributary of Woodplumpton Brook
- Catforth affecting Catforth Brook, a tributary of Woodplumpton

Section 22 of the Environment Act places a new duty on sewerage undertakers, via section 101A of the Water Industry Act 1991, to provide, where appropriate, first time sewerage facilities in areas suffering from environmental or amenity problems caused by the existing sewage disposal arrangements.

## **Industrial**

As a result of former policies of encouraging discharges of trade effluent to sewer, there are only a small number of industrial discharges to watercourse within the Wyre Area.

The major industrial site within the Area is the ICI Hillhouse site at Fleetwood (see map 19). There are five outfalls that discharge to the Wyre Estuary from this site. Discharges are controlled by both a Water Resources Act consent and by Environmental Protection Act authorisations. The consent and authorisations are continually being reviewed and effluent standards tightened. Considerable scaling down of operations has occurred on this site in recent years.

The trade effluent discharges and the Wyre Estuary are monitored under the Dangerous Substances Directive since the discharges contain List 1 and List 2 substances. Monitoring of both the trade effluents and the Wyre Estuary is carried out by both the Agency and ICI. At present concentrations of dangerous substances in the Estuary and in the biota within the Estuary are meeting the mandatory environmental quality standards contained in the Directive. However, this has not always been the case in the past. The graph on page 68 shows how the concentration of mercury in mussels in the Wyre Estuary has dropped over the last 17 years:

In July 1996 the Agency issued a consultation document entitled "The application of toxicity based criteria for the regulatory control of wastewater discharges". This is a new approach that is being promoted for environmentally significant discharges of complex composition where not all important constituents can be individually identified and numerically limited. Once implementation procedures have been established the Agency, in partnership with the dischargers, will be looking to apply this new approach to discharges from the ICI Hillhouse site.

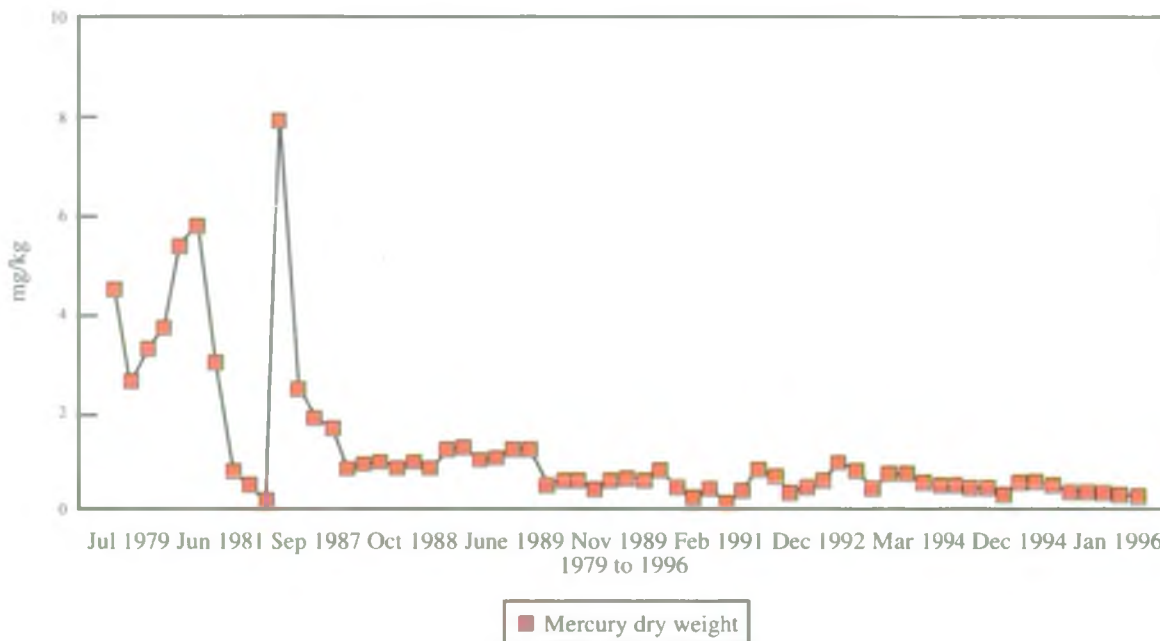
In addition to the discharges from the ICI Hillhouse site, until recently (Summer 1996) there was a further major discharge to the Wyre Estuary from Isaac Spencer's fish meal processing plant at Fleetwood. The closure of this plant has resulted in a significant reduction in BOD and ammonia loads entering the Estuary.

The proposed Wyre barrage has major implications for water quality within the Wyre Estuary, particularly if a barrage is proposed downstream of the ICI Hillhouse site, and a full environmental impact assessment will be required in support of such a proposal. There is also a further proposal for the construction of a gas power station and gas holding facilities on the ICI Hillhouse site. The Agency has been involved in initial discussions over this proposed development which could potentially involve a further major discharge to either the Wyre Estuary or to the Lune Deeps.

There are also a small number of NWW water treatment plants (WTPs) in the catchment. Discharges from these plants to surface waters are treated as trade discharges, are subject to consent conditions and generally do not cause water quality problems.

Victoria Road Hospital, Blackpool holds a Radioactive Substances Authorisation, required under the Radio Active Substances Act 1993. This is to authorise the holding and disposal of radioactive substances required to undertake for example: X-rays and radiotherapies.

### Wyre Estuary at Wardleys Creek Mercury in Biota



## Intermittent Discharges

### Combined Sewerage Systems

Combined sewerage systems carry both foul drainage and surface water runoff e.g. rainfall. Combined sewer overflows (CSOs) and sewage pumping station overflows are located on most sewerage systems in the catchment and are subject to consents which aim to limit the frequency of the discharge to occasions when intense rainfall occurs and adequate dilution is available in the receiving watercourse.

However, on many sewerage systems, particularly older systems, sewers may be overloaded and overflows may occur at a greater than acceptable frequency. There has been a reduction in the scale of problems from the sewerage systems within parts of the catchment as a result of work started in the 1970s and also as a result of the Fylde Coastal Improvements scheme completed in 1996. Discharges of storm sewage from the pumping stations at Manchester Square, Anchorsholme, Chatsworth Avenue, Lennox Gate and Harrowside should now only occur following periods of heavy rainfall. NWW are working with the Agency to systematically survey sewerage systems and identify and improve or eliminate unsatisfactory overflows in the rest of the Area.

There are in the region of 60 combined sewer overflows in the Wyre Area. Of these overflows approximately 20 are presently identified as unsatisfactory. Within the 3 year period to 2000, NWW have been allocated funding to address 3 unsatisfactory CSOs discharging to Marton Mere. The remaining unsatisfactory CSOs in the Wyre Area are not programmed to be improved until after the year 2000.

### Separate Sewerage systems

Separate sewerage systems use surface water sewers for dealing with surface water and foul sewers for dealing with foul drainage. However surface waters are liable to contamination, mainly due to wrong connections of foul drainage into the surface water drainage network. In 1996 NWW completed a three year project aimed at resolving the most significant contaminated surface water (CSW) discharges. However, not all problems have been resolved and further contaminated surface water discharges have now been discovered which require improvement work in the future. Royles Brook and Hillylaid Pool are particularly badly affected by CSW discharges.

### Industrial Estates

There are a number of smaller industrial estates within the Wyre Area and separate surface water drainage systems on these estates are liable to contamination. Contaminated discharges from these can potentially have an impact on the receiving water. The lower reaches of Main Dyke and Royles Brook can be affected by contaminated discharges from the Poulton Industrial Estate and the Red Marsh industrial estate respectively.

### Agriculture

Agricultural activity predominates over much of the Wyre Area. The major activity is dairy farming which is particularly intensive on the fertile Fylde plain. Other livestock farming is commonplace such as poultry and pig farming as well as sheep farming in the upper parts of the Trough of Bowland Area. Some mixed livestock/arable farming occurs around the drained mossland around Pilling.

Incidents from livestock farms including releases of silage, slurry and other farm waste can cause serious pollution problems. Proactive surveys and farm visits are ongoing within the catchment to identify sources of farm pollution and pollution control staff provide advice to farmers to improve their storage facilities to prevent pollution incidents occurring. Many farms identified as a result of such visits have often implemented remedial works to prevent pollution, often at considerable cost to the farmer.

The intensive agricultural activity predominating over the catchment also causes problems from diffuse pollution, in particular from the spreading of farm waste as well as artificial fertilisers and pesticides. These diffuse pollution sources are more difficult to control. The use of Farm Waste Management Plans to control this type of pollution is promoted by both the Agency and ADAS.

## Diffuse Sources

Natural diffuse acidic run-off from peat bogs occurs in the upper Wyre Area in watercourses located in the Trough of Bowland and associated impacts in terms of solids, colour and foaming also occurs.

## Effluent Disposal Objectives

### Environmental Objectives

To monitor surface waters and discharges to establish compliance with river quality objectives and effluent consent standards and to ensure that other uses are not compromised.

To ensure requirements for improvements are identified and pursued for both continuous and intermittent discharges.

### Environmental Requirements

## Water Quality

No deterioration in upstream water quality, beyond that assumed in setting consents.

## Water Quantity

No significant reduction in river flow beyond that used in setting consents.

## Physical Features

Outfalls should be sited to achieve rapid mixing of effluent with river contents and to minimise impact on amenity value.

## Issues Arising:

- |           |  |
|-----------|--|
| Issue 7:  | <b>Impact of North West Water (NWW) Ltd Wastewater Treatment Works</b>                 |
| Issue 8:  | <b>Impact of discharges from combined sewer overflows</b>                              |
| Issue 9:  | <b>Impact of contaminated surface water discharges from separate sewerage systems.</b> |
| Issue 11: | <b>Impact of ICI Hillhouse International on the environment</b>                        |

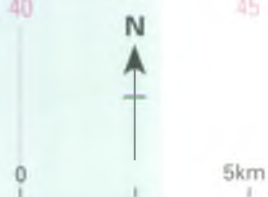


Wyre  
Local Environment Agency  
Plan  
Map 20



ENVIRONMENT AGENCY

SD 40 45 50 55 60 65 70



SD  
50  
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40  
35

55  
50  
45

Irish Sea

FLEETWOOD

Knott End-on-Sea

CLEVELEYS

Hambleton

THORNTON

POULTON-LE-FYLDE

BLACKPOOL

Marton Mere

Elswick

St Michael's-on-Wyre

Catterall

Garstang

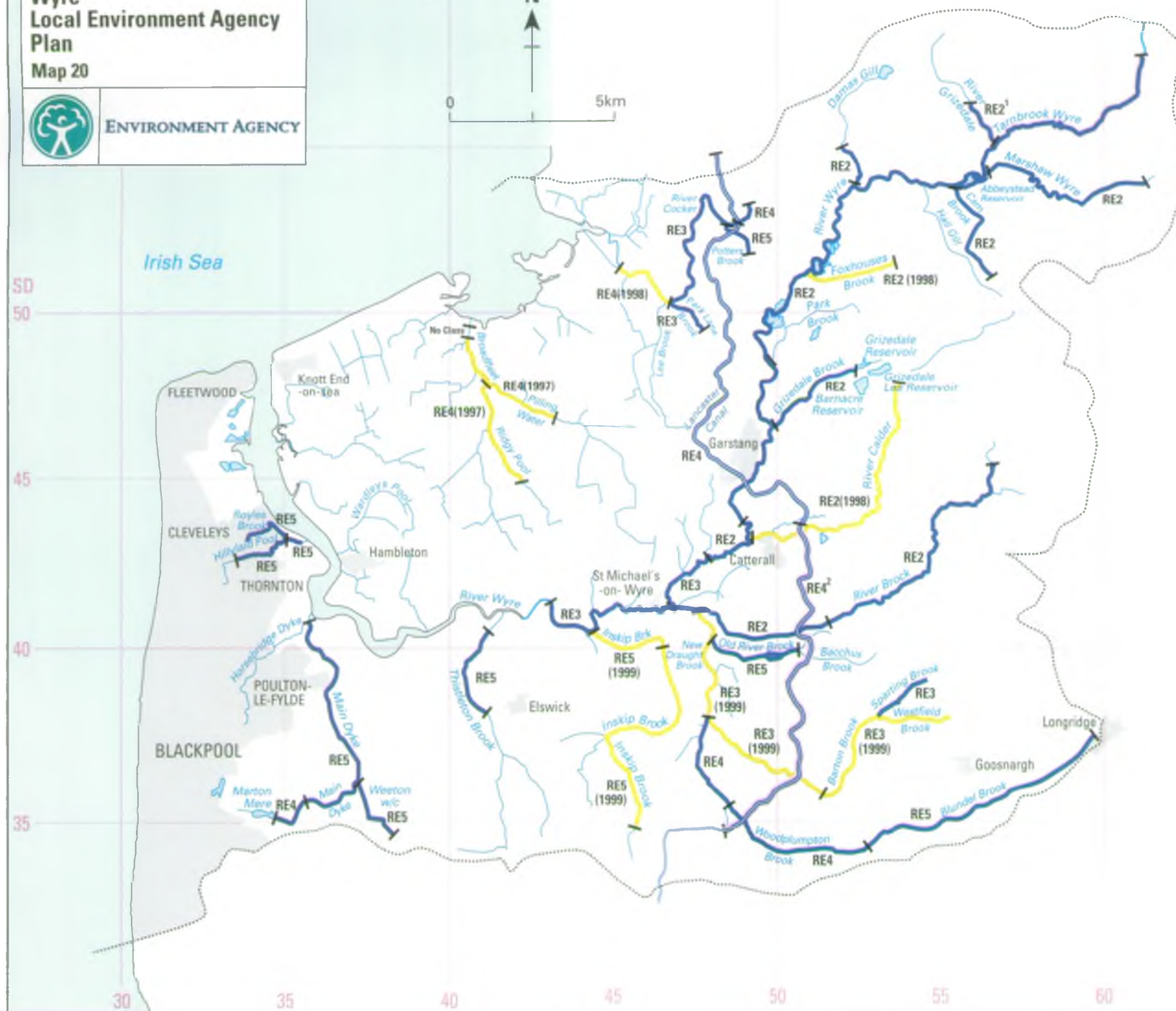
Secoch Brook

Longridge

State of the Catchment-  
Short to Medium Term RQOs

KEY

- Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Compliant
- Marginal Failure
- Significant Failure
- Derogation for pH<sup>1</sup> or BOD<sup>2</sup>
- RE River Quality Objective
- Reach Boundary



## **2.2 STATE OF THE LOCAL ENVIRONMENT**

### **2.2.1 Water Quality**

Water quality plays a significant role in determining a variety of uses that the Wyre LEAP Area can support. This section explains the criteria used to set water quality standards within the Area and the method of assessing current water quality against these standards.

#### **Agency Monitoring Duties**

The Agency has a duty to monitor the extent of pollution in controlled waters. Controlled waters include rivers, streams, ditches, lakes, groundwaters, estuaries and coastal waters. This is achieved by chemical, biological and microbiological sampling programmes. Water quality information is available to the public and held on the Water Resources Act Register.

#### **Water Quality Objectives**

Water Quality Objectives can be considered in three parts:

- Short to medium term River Ecosystem Water Quality Objectives
- EC Directive Water Quality Objectives
- Long term River Ecosystem Water Quality Objectives

#### **Short to Medium Term River Ecosystem Water Quality Objectives**

Every classified stretch in the Wyre Area has been set a short to medium term water quality objective (RQO) comprising a River Ecosystem class and an associated target date. Descriptions for the five River Ecosystem Use classes and the quality criteria for each class are given in Appendix 1.

Where an objective has been set in order to prevent deterioration of present water quality the objective applies with immediate effect. For the other stretches, target dates have been set to coincide with completion of capital works or farm campaigns by Agency pollution control staff for example RE3(1997). This indicates an objective of class RE3 to be attained by the year 1997.

#### **EC Directive Water Quality Objectives**

The following EC Directives contain standards which have implications for water quality within the Wyre Area:

The Dangerous Substances Directive (76/464/EEC) which is concerned with controlling pollution caused by discharges of certain dangerous substances.

The Bathing Water Directive (76/160/EEC) which sets Environmental Quality Standards (EQSs) for designated waters that are used for bathing.

The Freshwater Fisheries Directive (78/659/EEC) which sets Environmental Quality Standards for stretches of water that are designated as being suitable for salmonid or cyprinid fisheries.

The Urban Waste Water Treatment Directive (91/271/EEC) which specifies requirements for the collection and treatment of industrial and domestic waste waters at urban wastewater treatment works and for treatment of wastewater from certain sectors of industry prior to direct discharge to watercourse.

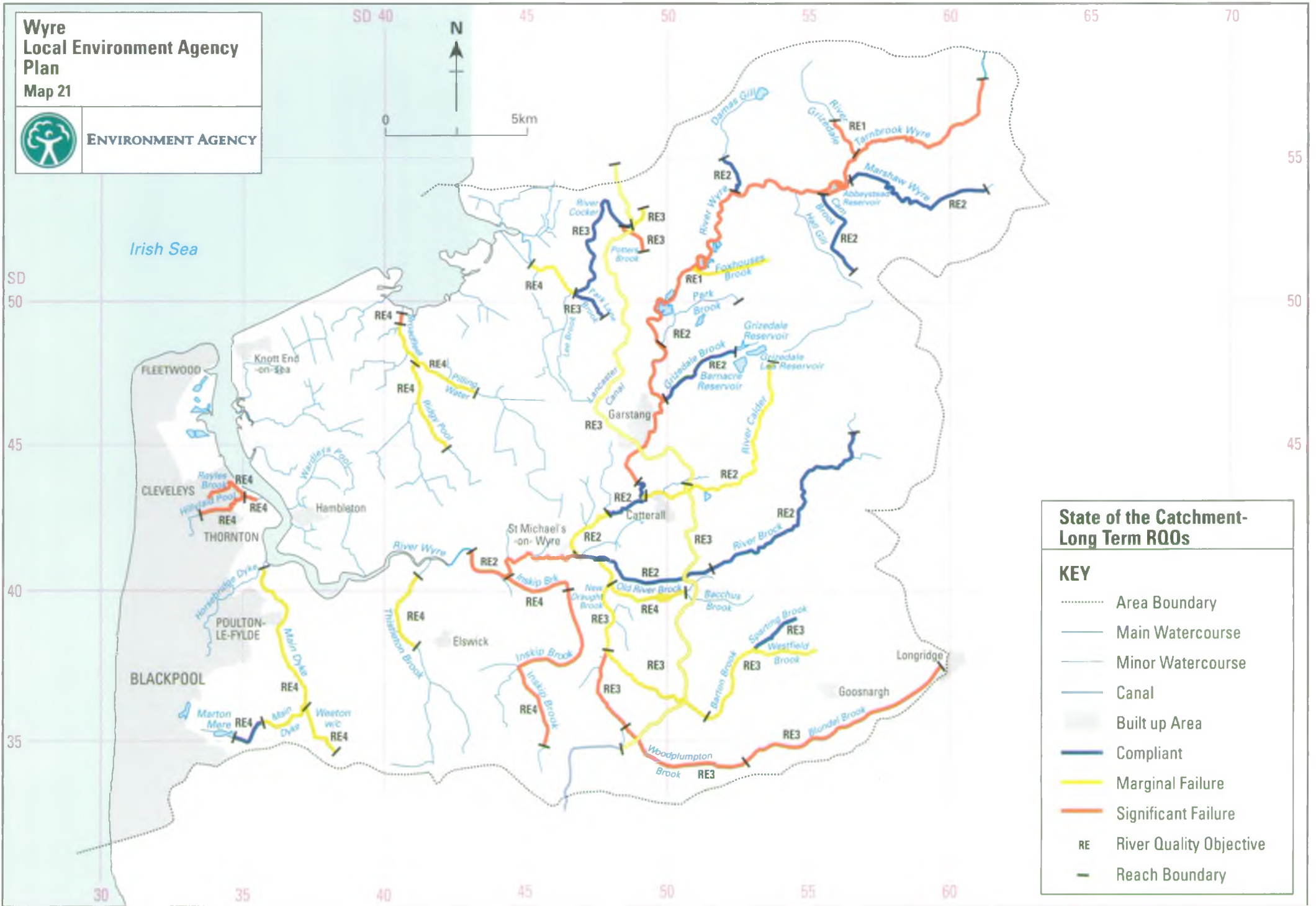
#### **Long Term River Ecosystem Water Quality Objectives.**

River Ecosystem water quality objectives for the short to medium term have already been described above. These targets reflect the improvements in water quality expected to come about through investment and pollution control measures which should take place over the next five years.

Wyre  
Local Environment Agency  
Plan  
Map 21



ENVIRONMENT AGENCY



**State of the Catchment-  
Long Term RQOs**

**KEY**

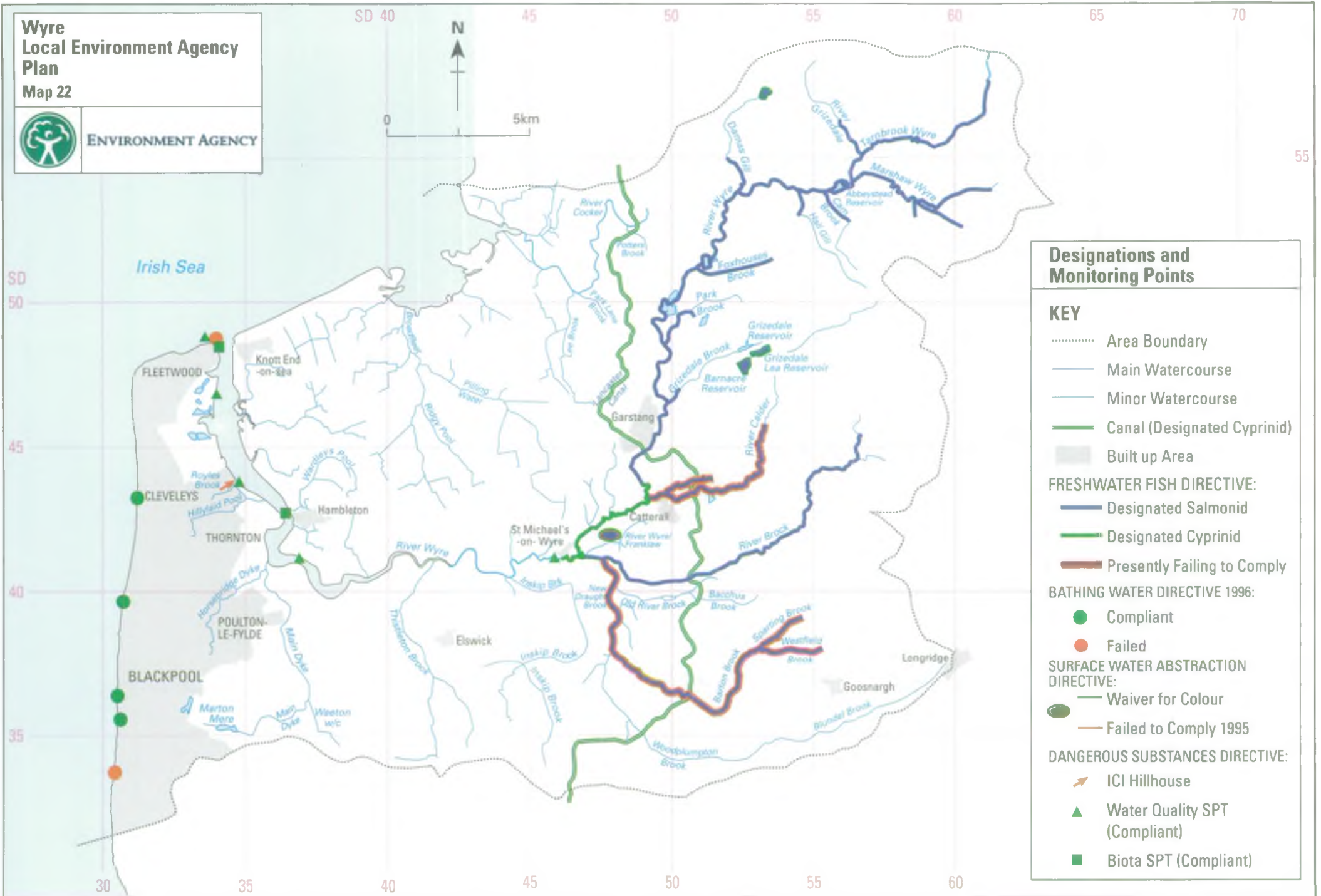
- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal
- Built up Area
- Compliant
- Marginal Failure
- Significant Failure
- RE River Quality Objective
- Reach Boundary



Wyre  
Local Environment Agency  
Plan  
Map 22



ENVIRONMENT AGENCY



### Designations and Monitoring Points

**KEY**

- ..... Area Boundary
- Main Watercourse
- Minor Watercourse
- Canal (Designated Cyprinid)
- Built up Area

**FRESHWATER FISH DIRECTIVE:**

- Designated Salmonid
- Designated Cyprinid
- Presently Failing to Comply

**BATHING WATER DIRECTIVE 1996:**

- Compliant
- Failed

**SURFACE WATER ABSTRACTION DIRECTIVE:**

- Waiver for Colour
- Failed to Comply 1995

**DANGEROUS SUBSTANCES DIRECTIVE:**

- ICI Hillhouse
- ▲ Water Quality SPT (Compliant)
- Biota SPT (Compliant)

For some stretches of river no investment is planned over the short to medium term although water quality is presently poor or bad. In the longer term the Agency is committed to seeking further improvements in these reaches and in this respect long term River Ecosystem objectives have also been proposed for all classified stretches in the Wyre Area. Further details of the proposed objectives are given in Appendix 1.

## State of the local Environment

### General

It is possible to assess the state of the watercourses within the Wyre Area against these targets.

The assessment has been made using data from the routine water quality sampling programme. A three year period (1993-1995 calendar years) has been taken, the error involved in sampling has been considered and statistical confidence limits calculated for the water quality data.

In assessing compliance with River Ecosystem objectives, stretches which presently **comply with** their water quality objectives are coloured blue, stretches that **marginally fail** to comply with their water quality objectives are coloured orange and stretches that **significantly fail** to comply with their water quality objectives are coloured red.

In some instances, for example areas where natural conditions give rise to reduced pH, high concentration of algae or discoloration, circumstances require that certain determinands are not taken into account when assessing compliance. This approach enables water quality to be protected by setting targets which prevent deterioration in the other determinands. Stretches where such derogations have been applied are coloured pink.

The state of the Wyre Area in terms of compliance with short to medium term River Ecosystem objectives is shown on map 20. The state of the Wyre Area in terms of compliance with long term River Ecosystem objectives is shown on map 21 and the state of the Wyre Area in terms of compliance with EC Directive objectives is shown on map 22. A table of River Ecosystem objectives is included in Appendix 1 and views on these are welcomed.

### Failures to meet objectives and issues arising

Three subsequent types of failures to meet objectives have arisen:

Failures to meet short to medium term River Ecosystem objectives (RQOs)

Failures to comply with EC objectives

Failures to comply with long term River Ecosystem objectives

Failures to meet objectives and other water quality problems i.e. problems occurring in watercourses not routinely sampled and water quality problems not detected by the River Ecosystem classification scheme, have been grouped together and have been discussed in the **Issues** section under the following headings:

- Issue 7: **Impact of discharges from NWW Ltd Wastewater Treatment Works**
- Issue 8: **Impact of discharges from combined sewer overflows**
- Issue 9: **Impact of contaminated surface water discharges from separate sewerage systems**
- Issue 10: **Failure to comply with Water Quality Objectives due primarily to agriculture**
- Issue 11: **Impact of ICI Hillhouse International on the environment**
- Issue 12: **Loss of aquatic species diversity and flooding problems due to the impact of highway drainage**
- Issue 13: **Deterioration in water quality due to lack of sewerage facilities**
- Issue 15: **Environmental impact of Jameson Road Landfill Site**
- Issue 16: **Impact of contaminated land on the environment**

Failure to meet Surface Water Abstraction Directive standards Agency monitoring of the River Wyre intake to Franklaw Water Treatment plant indicated a failure to meet the Surface Water Abstraction Directive standard for hydrocarbons. This failure was due to one a typical result and is not deemed to be significant.

## 2.2.2 Air Quality

### General

Air quality is an indicator of environmental quality. Air pollution can damage flora and fauna, buildings and have significant effects on soils and water. It can also cause serious problems for those with asthma, bronchitis and other respiratory diseases.

Air pollution may be in the form of gas or particulate matter. Its dispersion and dilution depends on climatic conditions. Its impact may be local, especially with regard to particulate matter which will often settle on nearby land or water or may be global for example effecting the ozone layer or the concentrations of greenhouse gases such as carbon dioxide. It is vital that we protect the air since the future health of mankind and the environment depends on it.

### The Role of the Agency

The Environment Agency has wide powers, but will need to work closely with others if environmental improvements are to be achieved. The Agency will need to look at partnerships with national and local government, business, industry, and environmental and conservation groups to maximise its influence in securing environmental improvements. This is particularly important with regard to local air quality, where the Agency is only one of a number of regulatory bodies.

The Local Authority has primary responsibility for local air quality.

The Environment Agency has powers to regulate air quality principally by operating a system called Integrated Pollution Control (IPC) for certain industrial processes which stems from Part I of the Environment Protection Act (EPA90). The processes that are regulated are potentially most polluting industrial processes including large combustion plant, iron, and steel making, the chemical industry, solvent recovery and incineration plants. Nationally there are approximately 2,500 of such licensed processes.

The objective of the IPC is to develop an approach to pollution that considers releases to all media from industrial processes in the context of the effect on the environment as a whole. This is to ensure that where releases to the environment cannot be avoided, the release is to the media which offers the Best Practicable Environmental Option.

The Agency also regulates landfill sites and in particular landfill gas which is a product resulting from chemical and biological breakdown at waste sites. This gas is principally a mixture of methane and carbon dioxide. Methane is a greenhouse gas which is flammable/explosive when mixed with air and carbon dioxide is an asphyxiate.

### The Role of other Organisations

The **Department of Transport (Dtp)** enforces controls on vehicle manufacturers.

The **Health and Safety Executive** monitors the nuclear industry and issues site licences etc.

The **County Council Structure Plan** contains policies on the need to control pollution and the County Analyst provides an analytical service for district Council Environmental Health Officers (EHO's).

**Local Authority** Environmental Health Departments regulate air pollution from thousands of industrial premises under Part I of the Environmental Protection Act 1990. These are premises with generally a lesser potential to pollute than those the Agency regulates. The processes concerned are known as Part B process and only the released to the air are controlled. Local Authorities also deal with a wide range of non-industrial and other forms of pollution, such as smells from domestic and agricultural premises, smoke from outdoor cable burning and noise pollution. Many Local Authorities monitor air quality in their area (see local perspective).

The Police are responsible for controlling emissions from vehicles.

Under the IPC arrangements, the Agency places in the public IPC register the following:-

- \* application for authorisations;
- \* representations from statutory consultees;
- \* authorisations including limits set on releases;
- \* monitoring information required by conditions of an authorisation;
- \* any enforcement action or prosecutions taken by the Agency against the then

## National Air Quality Strategy

Under Part 4 of the Environment Act 1995 the Government is required to publish a national strategy for air quality including:

- \* a framework of standards and objectives for the pollutants of most concern
- \* a timetable for achieving objectives
- \* the steps the Government is taking and the measures it expects others to take to see that objectives are met.

The strategy was published for consultation in the summer of 1996. We will be working closely with local authorities to help achieve the objectives of the National Air Quality Strategy.

## Local Air Quality Management Area

Local Authorities will be required to review the present and future air quality against air quality standards and objectives shortly to be prescribed in regulations made by the Government. The standards are likely to reflect advice from controlling bodies such as EC and WHO who will take into account potential risks, costs, and technical feasibility. In addition, the Government will set air quality targets should be achieved throughout the UK by 2005. The strategy will therefore necessitate periodic reviews of air quality. Where standards are not being met or are not likely to be met an air quality management area should be declared, known as a "Designated Area", and an action plan produced to improve air quality. This will require objective assessments together with appropriate monitoring and modelling studies. Hence the need for the Agency to liaise fully with the Local Authority.

## Local Perspective

Air quality monitoring sites exist within the Wyre area at the following locations:

	<u>Location</u>	<u>Determinand</u>
Blackpool Borough Council	Junction of Devonshire Road Counce Street	Sulphur Dioxide
Preston Borough Council	Town Hall at Lancaster Road	Sulphur Dioxide Nitrogen Oxides
Lancaster City Council	4 sites in Lancaster	Sulphur Dioxide Nitrogen Dioxide Ozone
	2 sites in Morecambe	Nitrogen Dioxide
Flyde Borough Council	4 sites in Lytham	Nitrogen Dioxide

Further details of air quality monitoring can be obtained from these Local Authorities.

## APPENDICES

### APPENDIX 1

#### General Quality Assessment and Statutory Water Quality Objectives

The Agency uses two principal schemes for the reporting and management of river water quality: the General Quality Assessment (GQA) scheme and the Statutory Water Quality Objectives (WQOs) scheme. These schemes have replaced the National Water Council (NWC) water quality classification system used previously.

The GQA scheme is used to make periodic assessments of the quality of river water in order to monitor geographical and temporal trends. The scheme as presently envisaged will comprise four components - general chemistry, nutrients, aesthetics and biology - each providing a discrete "window" upon the quality of river stretches. The general chemistry and biology components of the GQA scheme are in current use. The remaining two windows are still being developed.

The WQO scheme establishes clear quality targets to provide a commonly agreed planning framework for regulatory bodies and dischargers alike. The proposed WQO scheme is based upon the recognised uses to which a river stretch may be put. These uses include: River Ecosystem; Special Ecosystem; Abstraction for Potable Supply; Agricultural/Industrial Abstraction; and Watersports. The standards defining the five-tiered River Ecosystem (RE) use classes, which address the chemical quality requirements of different types of aquatic ecosystems, were introduced by *The Surface Waters (River Ecosystem) Classification Regulations 1994*. (Standards for the other uses are still under development). For each stretch of river, a target RE class will be assigned, including a date by which this level of water quality should be achieved. Until WQOs are formally established by legal notice served by the Secretary of State, and therefore exist on a statutory basis, they will be applied on a non-statutory basis through a translation of River Quality Objectives (RQOs) from NWC classes to appropriate RE classes and target dates.

The GQA and WQO schemes are initially being applied only to Rivers and Canals. Schemes for other controlled waters are also under development.

#### Tidal Waters and Estuaries

Tidal Waters and Estuaries are presently still classified using the National Water Council (NWC) scheme which considers dissolved oxygen, aesthetic quality and biological quality and places water quality into one of four classes.

#### River Quality Objectives (RQOs) for the Wyre Area

Although these objectives are non-statutory, they are presented here for informal consultation and comments are invited on their suitability. When the Secretary of State introduces statutory WQOs (currently being trailed nationally), further formal consultation will take place. Once in force the Agency and the Secretary of State are under a duty to exercise the powers conferred on them, under the water pollution provisions of the Water Resources Act 1991, to ensure the requirements of the Statutory WQOs are met, so far as it is practicable by the exercise of those powers to do so.

Since 1989 the former National Rivers Authority was working towards the achievement of Long Term Objectives (LTOs) known as River Quality Objectives (RQOs) that were formulated by the former North West Water Authority.

These targets were originally set in 1979 following a public consultation procedure and they were set in terms of National Water Council (NWC) classes. In general terms the policy was to achieve at least class 2 water quality in rivers and canals by 2010 whilst preventing deterioration of watercourses of a higher standard. For tidal waters a similar aim was to achieve at least class B.

Although it does not necessarily follow that there is a fully neutral translation between the NWC and River Ecosystem classification schemes in all cases, for most stretches there is a degree of compatibility as described below:

NWC Class	River Ecosystem Class
1A	RE 1
1B	RE 2
2	RE 3 or RE 4
3	RE 5
4	-

Thus, to an extent the long term objectives are translations of the original objectives set in 1979. Significant (i.e. non-neutral) changes to this are listed below (section vi) and views on these are welcomed:

### Changes to Water Quality Objectives set in 1979 (following November 1978 public consultation)

i) The length of classified river stretch in the following watercourses has been extended, e.g. up to river source :

Woodplumpton Brook (0.5 km RE4 added)	Barton/Westfield Brook (0.4 km RE4 added)
River Calder (2.5 km RE2 added)	Grizedale Brook (2.0 km RE2 added)
River Cocker (2.6 km RE2 added)	Broad Fleet (1.0 km RE4 added)
Pilling Water (1.8 km RE4 added)	

ii) The length of classified river stretch in the following watercourses has been extended to the tidal limit:

River Wyre below its confluence with the River Brock (5.5 km RE2 added)

iii) The length of classified river stretch in the following watercourses has been shortened, e.g. to exclude reservoirs, or due to remeasurement:

Hillylaid Pool (0.8 km RE4 removed)	Main Dyke (1.5 km RE4 removed)
Lords Brook Inskip (2.5 km RE4 removed)	Old River Brock (0.6 km RE4 removed)
Ridgy Pool (0.4 km RE4 removed)	

iv) The following watercourses have been removed from the classification scheme:

Tail Clough (1.0 km removed) #	Meer Brook (0.3 km removed) #
Street Brook (0.3 km removed) #	Park Brook (1.6 km removed) #
Tithebarn Brook (1.4 km removed) #	Little River Calder (3.9 km removed) #
Hall Gill (1.0 km removed) #	Parkhead Brook (1.6 km removed)
Hollyoven Brook (1.1 km removed)	Scholar Brook (2.6 km removed)
Medlar Brook (1.6 km removed)	Calder Brook (1.1 km removed)
Grange Pool (2.3 km removed)	Cockers Dyke (1.0 km removed)
Middle Dyke (0.7 km removed)	

N.B. # = designated salmonid fisheries under the Freshwaters Fisheries Directive (now monitored by sampling points situated further downstream in the catchment.)

v) The following stretches have been added to the classification scheme:

Trib of Main Dyke/Weeton Watercourse (1.9 km RE4 added)  
 Park Lane Brook (1.4 km RE2 added)  
 Potters Brook (0.6 km RE4 added)



vi) The following long term objectives are **not** neutral translations of previous NWC class objectives:

New Draught Brook - 3.7 km RE3 (previous LTO was 1b for 2.6 km)

Woodplumpton Brook - 8.4 km RE3 (previous LTO was 1b)

Barton Brook - 13.6 km RE3 (previous LTO was 1b)

Sparting Brook - 2.5 km RE3 (previous LTO was 1b)

Lancaster Canal - 27.4 km RE3 (previous LTO 15.5 km 1a and 11.9 km 1b)

### River Ecosystem classes

Descriptions for the five River Ecosystem Classes are given below:

RE Class	Description
RE 1	Water of very good quality suitable for all fish species
RE 2	
RE 3	
RE 4	
RE 5	
Waters not achieving class RE 5 are of bad quality in which fish are unlikely to be present	

Both short to medium term and long term RQOs for the Wyre Area are tabulated on the following pages.

### Wyre LEAP - Proposed RQOs

River	Reach	RQO short term	RQO long term	Present status	Comments
River Wyre	Brock to FWL (6.0 km)	RE3	RE2	complying with RE3 significantly failing to meet RE2	sample point relocated in 1996
River Wyre	Garstang STW to Brock (2.7 km)	RE3	RE2	complying with RE3 marginally failing to meet RE2	
River Wyre	Below Garstang to Garstang STW (2.6 km)	RE2	RE2	complying with RE2	
River Wyre	QSL at Hare Syke to Below Garstang (28 km)	RE2	RE1	complying with RE2 significantly failing to meet RE1	RQO long term subject to review
Hillylaid Pool	Royles Brook to FWL (0.5 km)	RE5	RE4	complying with RE5 significantly failing to meet RE4	
Hillylaid Pool	QSL Breedy Butt to Royles Brook (0.5 km)	RE5	RE4	complying with RE5 significantly failing to meet RE4	
Royles Brook	QSL at A585 to ICI Complex (2.4 km)	RE5	RE4	complying with RE5 significantly failing to meet RE4	
Main Dyke	Staining PS to FWL (7.7 km)	RE5	RE4	complying with RE5 marginally failing to meet RE4	

River	Reach	RQO short term	RQO long term	Present status	Comments
Main Dyke	QSL Below Marton Mere to Staining PS (1.3 km)	RE4	RE4	complying with RE4	using field DO results 1995=>
Trib of Main Dyke	QSL at Weeton STW to Main Dyke (1.9 km)	RE5	RE4	complying with RE5 marginally failing to meet RE4	
Thistleton Brook	QSL at Elswick STW to FWL (3.4 km)	RE5	RE4	complying with RE5 marginally failing to meet RE4	
Lords Brook	SD 465 398 to Wyre Estuary (2.8 km)	RE5 (1999)	RE4	marginally failing to meet RE5 significantly failing to meet RE4	
Lords Brook	QSL Stanley Lodge to SD 465 398 (7.4 km)	RE5 (1999)	RE4	marginally failing to meet RE5 significantly failing to meet RE4	
River Brock	M6 to River Wyre	RE2	RE2	complying with RE2	excluding one sample taken in wet weather
River Brock	QSL at Bleasdeale to M6	RE2	RE2	complying with RE2	
New Draught Brook	Barton Brook to Brock (3.7 km)	RE3 (1999)	RE3	marginally failing to meet RE3	LTO 1B not achievable
Woodplumpton Brook	Swill Brook to Barton Brook (3.1 km)	RE4	RE3	complying with RE4 significantly failing to meet RE3	
Woodplumpton Brook	A6 Broughton to Swill Brook (3.1 km)	RE4	RE3	complying with RE4 significantly failing to meet RE3	LTO 1B not achievable
Woodplumpton Brook	QSL Withy Trees to A6 Broughton (5.3 km)	RE5	RE3	complying with RE5 significantly failing to meet RE3	LTO 1B not achievable
Old River Brock	QSL Bacchus Brook to New Draught Bk (3.3 km)	RE5	RE4	complying with RE5 marginally failing to meet RE4	
Barton Brook	Barton STW to New Draught Bk (5.3 km)	RE3 (1999)	RE3	marginally failing to meet RE3	LTO 1B not achievable
Barton/Westfield Brook	QSL Brook Farm to Barton STW (8.3 km)	RE3 (1999)	RE3	marginally failing to meet RE3	LTO 1B not achievable
Sparting Brook	QSL Silk Mill Bridge to Barton Brook (2.5 km)	RE3	RE3	complying with RE3	LTO 1B not achievable
River Calder	QSL Oakenclough Weir to Wyre (8.9 km)	RE2 (1998)	RE2	significantly failing to meet RE2	
Grizedale Brook	QSL Grizedale Reservoir to Wyre (2.8 km)	RE2	RE2	complying with RE2	added in 1992
Foxhouses Brook	QSL Above Lordhouse Bk to Wyre (1.8 km)	RE2 (1998)	RE2	marginally failing to meet RE2	added in 1992
Damas Gill	QSL upper Green Bank to Wyre (1.7 km)	RE2	RE2	complying with RE2	added in 1992

River	Reach	RQO short term	RQO long term	Present status	Comments
Catshaw Greave	QSL Blind Clough to Wyre (1.4 km)	RE2	RE2	complying with RE2	added in 1992
Marshaw Wyre	QSL Trough Road to Wyre (4.6 km)	RE2	RE2	complying with RE2	added in 1992
River Grizedale	QSL Grizedale Barn to Wyre (1.7 km)	RE2 *	RE1 *	complying with RE2 marginally failing to meet RE1	* derogation for pH
River Cocker	Lee Brook to FWL (1.9 km)	RE4 (1998)	RE4	marginally failing to meet RE4	
River Cocker	Potters Brook to Lee Brook (6.5 km)	RE3	RE3	complying with RE3	LTO 1B not achievable
River Cocker	QSL Hole of Ellel Bridge to Potters Bk (2.6 km)	RE4	RE3	complying with RE4 marginally failing to meet RE3	LTO 1B not achievable
Park Lane Brook	QSL at Patten Arms to Cocker (1.4 km)	RE3	RE3	complying with RE3	added in 1992
Potters Brook	QSL at Forton STW to Cocker (0.6 km)	RE5	RE3	complying with RE5 significantly failing to meet RE3	added in 1992
Broad Fleet	Pilling STW to Tidal Sluice (0.4 km)	No class	RE4	significantly failing to meet RE5 significantly failing to meet RE4	
Pilling Water	QSL at Bone Hill to Pilling STW (4.4)	RE4 (1997)	RE4	marginally failing to meet RE4	
Ridgy Pool	QSL Birk's Farm to Pilling Water (3.5 km)	RE4 (1997)	RE4	marginally failing to meet RE4	
Lancaster Canal	Catterall to conf near Galgate (15.5 km)	RE4	RE3	complying with RE4 marginally failing to meet RE3	LTO 1A not achievable
Lancaster Canal	Swillbrook to Catterhall (11.9 km)	RE4*	RE3*	complying with RE4 marginally failing to meet RE3	*derogation for summer BODs LTO 1B not achievable

**APPENDIX 2**  
**RIVER ECOSYSTEM CLASSIFICATION - WATER QUALITY**  
**CRITERIA**

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

**APPENDIX 3**  
**GENERAL QUALITY ASSESSMENT (GQA)**  
**CHEMICAL GRADING FOR RIVERS AND CANALS**

Water Quality	Grade	Dissolved Oxygen (% saturation)	Biochemical Oxygen Demand (ATU) <sup>1</sup> mg/l	Ammonia (mg N/l)
		10 percentile	90 percentile	90 percentile
Good	A	80	2.5	
	B	70	4	0.25
Fair	C	60	6	0.6
	D	50	8	1.3
Poor	E	20	15	2.5
Bad <sup>2</sup>	F	-	-	9.0

<sup>1</sup> as suppressed by adding allyl thio-urea

<sup>2</sup> i.e. quality which does not meet the requirements of grade E in respect of one or more determinands



**APPENDIX 4**  
**NATIONAL WATER COUNCIL (NWC) CLASSIFICATION**  
**SCHEME**  
**WATER QUALITY CLASSES FOR ESTUARIES**

Description	Points awarded if the Estuary meets this description
<b>Biological Quality</b> (scores under a, b, c & d to be summed)	
a) Allows the passage to and from freshwater of all relevant species of migratory fish, when this is not prevented by physical barriers.	2
b) Supports a residential fish population which is broadly consistent with the physical and hydrographical conditions.	2
c) Supports a benthic community which is broadly consistent with the physical and hydrographical conditions.	2
d) Absence of substantial elevated levels from whatever source.	4
Maximum number of points [sum a) to d)]	10
<b>Aesthetic Quality</b> (choose one of a) to d))	
a) Estuaries or zones of estuaries that either do not receive a significant polluting input or which receive inputs that do not cause significant aesthetic pollution.	10
b) Estuaries or zones of estuaries which receive inputs which cause a certain amount of pollution but do not seriously interfere with Estuary usage.	6
c) Estuaries or zones of estuaries which receive inputs which result in aesthetic pollution sufficiently serious to affect Estuary usage.	3
d) Estuaries or zones of estuaries which receive inputs which cause widespread public nuisance.	0
<b>Water Quality</b> (Score according to quality)	
Dissolved Oxygen exceeds the following saturation values:	
60%	10
40%	6
30%	5
20%	4
10%	3
below 10%	0
The points awarded under each of the headings of biological, aesthetic and water quality are summed. Waters are classified on the following scale: <b>Class A Good Quality 24 to 30 points</b> <b>Class B Fair Quality 16 to 23 points</b> <b>Class C Poor Quality 9 to 15 points</b> <b>Class D Bad Quality 0 to 8 points</b>	

## **APPENDIX 5 - GLOSSARY**

### **Abstraction Licence**

Licence to abstract water from a surface or underground source. The maximum annual, daily and hourly abstraction rates are set by the licence.

### **AMP2 - Asset Management Plan**

The second set of Asset Management Plans produced by Water Companies. The Plans cover the Water Companies' known investment of existing and other obligations (such as the operation and maintenance of existing water and wastewater systems) for the 10 year period 1995 to 2005. The Environment Agency is involved in setting priorities for work necessary for environmental improvements within allowed expenditure limits. Prices are controlled by an independent regulator, the Director General of Water Services (OFWAT). AMP 3 follows as the next planning period.

### **AONB**

Area of Outstanding Natural Beauty, notified by the Countryside Commission.

### **BOD**

Biochemical Oxygen Demand. A measure of the polluting potential.

### **Coarse Fish**

See FRESHWATER FISH, CYPRINIDS, SALMONIDS.

### **Consumptive Use**

Water which is abstracted but not returned to the catchment, either because it evaporates (as in spray irrigation) or is exported for use in another catchment.

### **County Structure Plans**

Statutory documents produced by County Councils outlining their strategy for development over a 10-15 year timescale.

### **Cyprinids**

Fish of the carp family. (See also COARSE FISH, FRESHWATER FISH, SALMONIDS).

### **Local Plans**

Statutory documents produced by Borough or City Councils to implement the development strategy set out in County Structure Plans. Specific land use allocations are identified.

### **Effective Rainfall**

Total rainfall minus direct evaporation and the water used by plants for transpiration. This is equivalent to the total resource of a catchment.

### **EIFAC**

The European Inland Fisheries Advisory Commission. An Agency of the United Nations Food and Agriculture Organisation (FAO).

## **Fish Age**

0+ - less than 1 year. >0+ - more than 1 year.

## **Flow Measurement Units**

m<sup>3</sup>/s Cubic metres per second

l/s Litres per second

MI/d Megalitres per day. A megalitre is equivalent to a ten metre cube (approximates to a 4-bedroom detached house).

mg/d Millions of gallons per day.

## **Flow Conversion Table**

<b>m<sup>3</sup>/s</b>	<b>MI/d</b>	<b>mgd</b>
0.012	1	0.224
0.06	5	1.12
0.12	10	2.24
0.24	20	4.48
0.6	50	11.2
1.2	100	22.4

## **Freshwater Fish**

For the purposes of the Salmon and Freshwater Fisheries Act 1975, fish other than salmon, brown trout, sea trout, rainbow trout and char (see also COARSE FISH, FRESHWATER FISH, SALMONIDS).

## **Hectare**

Unit of area 100m x 100m, equal to 2.471 acres.

## **Impoundment Reservoir**

Surface water storage area formed by construction of a dam and supplied only by natural inflow from the upstream catchment.

## **List 1 Substances**

Dangerous substances which are particularly hazardous on account of their toxicity, bioaccumulation potential and persistence and which require special controls. Environmental quality standards have been set by the EC.

## **List 2 Substances**

Dangerous substances which are less hazardous than List 1 substances. Environmental quality standards are shortly to be introduced into UK law by regulations.

## **Local Nature Reserve**

A nature reserve designated by a Local Authority, frequently owned or managed by a voluntary conservation organisation.

## **LTA**

Long term average

## **Main River**

The Agency has permissive powers to carry out works of maintenance and improvement on these rivers.

## **National Nature Reserve**

A nature reserve of national importance, designated and managed by English Nature.

## **Potable Water Supply**

Water supplied for domestic use, including human consumption.

## **Pool: Riffle**

A stretch of river with sections of shallow, fast-flowing water and deeper slow-moving pools.

## **Ramsar Site**

A wetland site of international significance for conservation, notified under international treaty.

## **Redd**

Spawning area.

## **SAC**

Special Area of Conservation. A European legislation classification.

## **Salmonids**

Fish classified by the Salmon and Freshwater Fisheries Act 1975 as belonging to the salmon family - salmon, brown trout and char. (Summer-spawning salmonid species such as grayling are classified by the Act as Freshwater Fish.) (See also COARSE FISH, FRESHWATER FISH, CYPRINIDS.)

## **SNCI**

Site of Nature Conservation Interest. A site of local importance for wildlife or geology, identified by the County Wildlife Trust or the County Council.

## **SPA**

Special Protection Area. A European legislation classification.

## **Spate Flows**

Episodic fresh water flood flows.

## **SSSI**

Site of Special Scientific Interest. A site designated by English Nature as being in need of protection to conserve its outstanding ecological or geological features. Land use and management operations within SSSIs are subject to control.

## **WwTW**

Wastewater treatment works.

## MANAGEMENT AND CONTACTS:

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

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

Rio House, Waterside Drive, Aztec West, Almondsbury, Bristol BS12 4UD  
Tel: 01454 624 400 Fax: 01454 624 409

## NORTH WEST REGION INFORMATION ENQUIRIES

**REGIONAL OFFICE**  
Richard Fairclough House  
Knutsford Road  
Warrington WA4 1HG  
Tel: 01925 653999  
Fax: 01925 415961

**NORTHERN AREA OFFICE**  
Chertsey Hill  
London Road  
Carlisle CA1 2QX  
Tel: 01228 25151  
Fax: 01228 49734

**CENTRAL AREA OFFICE**  
Lutra House  
Dodd Way  
Walton Summit  
Bamber Bridge  
Preston PR5 8BX  
Tel: 01772 339882  
Fax: 01772 627730

**SOUTHERN AREA OFFICE**  
Mirwell  
Carrington Lane  
Sale M33 5NL  
Tel: 0161 973 2237  
Fax: 0161 973 4601



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

**ENVIRONMENT AGENCY  
GENERAL ENQUIRY LINE  
0645 333 111**

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

**ENVIRONMENT AGENCY  
EMERGENCY HOTLINE  
0800 80 70 60**



**ENVIRONMENT  
AGENCY**