catchment management plan

DOUGLAS

annual review

October 1996

ENVIRONMENT AGENCY

This annual review provides a progress update of all the actions stated in the River Douglas Catchment Management Plan Final Report (February 1995) produced under the auspices of the former National Rivers Authority (see Section 5.0).

Section 6.0 has been added to the report as a result of the new Water Quality Objective Scheme. Issues originally highlighted for action in the final report have been reviewed and comments regarding these issues are welcomed. The comments and questions should be forwarded to the Environment Planner by Friday 28 March 1997.

Front Cover: River Douglas
Wigan

RIVER DOUGLAS
CATCHMENT MANAGEMENT PLAN
FIRST ANNUAL REVIEW 1996

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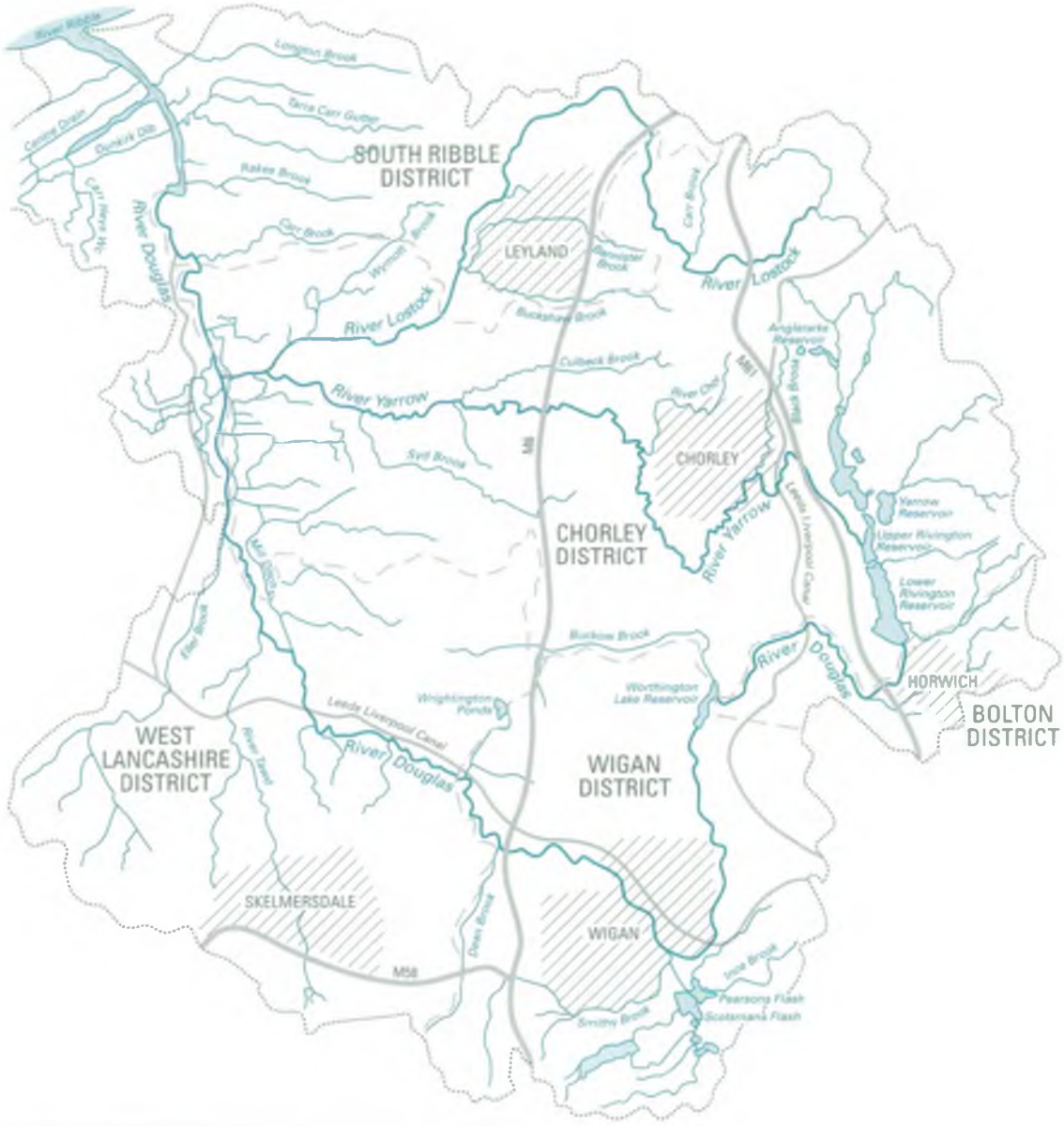

MAIN CATCHMENT DETAILS

River Douglas Annual Review

KEY

- Catchment boundary
- Built up area
- Rivers
- Reservoirs / Lakes
- Canal
- Major roads
- District Council boundary

ENVIRONMENT AGENCY

1.0 THE VISION

To realise the environmental potential of the Douglas Catchment, the Environment Agency will work in partnership with catchment users to create and maintain a balanced water system, to meet both their needs and demands and those of the environment. In pursuit of this the Environment Agency is closely involved with the Mersey Basin Campaign.

The Environment Agency's vision for the future of the catchment is that:

There will be a standard of water quality throughout the catchment which supports a diverse ecosystem, including fisheries.

The type and location of development within the river corridor and floodplain will have been influenced through liaison with local planning authorities so as to protect and enhance the water environment and associated land.

Water resources will be effectively managed to balance the needs of all users within the catchment.

There will be an increased biodiversity of the natural habitat along the river corridor and enhanced recreational activities such that the all aspects of the river catchment can be enjoyed by local communities.

A standard of flood defence will be provided which is both cost effective and environmentally sound.

2.0 INTRODUCTION

2.1 THE ENVIRONMENT AGENCY

On April 1st 1996 the National Rivers Authority (NRA), Her Majesty's Inspectorate of Pollution (HMIP) and the Waste Regulation Authorities (WRA) combined to form the Environment Agency. The Agency will have all the powers and responsiblities of each of these pre-existing bodies, including a responsibility to produce action plans and annual reviews of existing Catchment Management Plans (CMPs).

2.2 THE MANAGEMENT PLANNING PROCESS

The NRA adopted the concept of integrated catchment management as a means of balancing both the needs of all users of the water environment and the interests of the water environment itself. As part of this process, the NRA undertook a programme of CMP's. Through these plans the NRA aimed to realise the environmental potential of a catchment, in terms of water quality, water quantity and physical features.

The first stage of this management plan process is the production of a Consultation Report. This outlines the issues within a catchment area and options for their solution. Following a period of consultation, involving both other organisations and individuals, an Action Plan is produced. This includes an activity plan for improvements to the area in terms of waste disposal, air and water environment. The action plan outlines areas of work and investment proposed by the Agency and others and incorporates a timescale against which these are to be completed.

An important part of the process is to monitor the Action Plan to ensure that actions are achieved and that the plan continues to address all relevant and significant issues in the catchment in an appropriate manner. This report summarises the progress made since the publication of the Action Plan. Since the River Douglas Plan was largely undertaken under the auspices of the NRA it only considers water issues pertaining to previous NRA responsibilites outlined in the Action Plan published in February 1995.

2.3 WATER QUALITY PLANNING

The original Douglas Catchment Management Plan expressed long term water quality planning targets in terms of National Water Council (NWC) classification scheme. This scheme has now been replaced with the Water Quality Objective (WQO) scheme. The consequence of this is that many of the issues pertaining to water quality have been reviewed and are included in section 6.0 - New Water Qualty Objective Scheme and revised issues.

3.0 OVERVIEW OF THE CATCHMENT

The River Douglas rises high on Rivington Moor in the eastern part of the catchment and flows approximately 37km before joining the River Ribble some 8km west of Preston. The catchment drains an area of 456 square kilometres and is unusual in that it does not flow through the centre of the catchment, but skirts the southern periphery. Three major tributaries join the River Douglas on its journey:

The River Tawd which rises in the south west corner of the catchment, draining Skelmersdale and its associated new town development.

The River Lostock which rises in the north east corner and receives drainage from the town of Leyland before flowing through intensively grazed farmland and subsequently joining the River Yarrow.

The River Yarrow, principally a rural river, which rises east of Chorley and joins the River Douglas in its tidal reaches.

The major discharger to the Douglas catchment is North West Water Ltd (NWW). There are 10 Wastewater Treatment Works (WwTWs) in the area and, in addition, approximately 160 combined sewer overflows concentrated mainly in the urban areas of Chorley and Wigan.
Contaminated road drainage may also have an impact on the water quality of the catchment; the M6 and M65 run through the catchment and, in addition, there are planned motorway works to construct a link between the M58 and M61 and work is ongoing to the existing M65.

WIGAN WASTEWATER TREATMENT WORKS HOSCAR

The surface waters of the catchment are used for both agricultural and spray irrigation and for industrial purposes. The Leeds/Liverpool Canal is fed by the River Douglas at Scholes and Gathurst Weirs and it is essential that water levels are carefully managed to ensure that the catchment is protected downstream of these points.

SCHOLES WEIR
WIGAN

In the low lying areas around Croston, Mawdesley and Rufford, agriculture and market gardening are the main activites within the flood plain. This area of the catchment consists largely of a pumped drainage system which maintains the surface water at a low level to enable the high grade agricultural land to be fully utilised. There are potential flooding problems, however, in Wigan, Croston and in the Leyland area. These areas are particularly sensitve to relatively short periods of intense rainfall and river level recorders are used to indicate likely flooding..

Himalayan Balsam and Japanese Knotweed are prevalent along many of the banks of the catchment and as a result the diversity of plant species is relatively limited along these stretches. The watercourses are generally canalised through the urban areas of Wigan and through the low lying, intensively farmed agricultural land. However, upstream of the urban areas the rivers tend to be of higher conservation value, with the banks supporting a diverse range of plant species. Some of the woodland which the River Yarrow flows through upstream of Chorley is Ancient Semi-Natural Woodland and as such is designated as a site of biological importance. As a statutory consultee for the Local Authority planning process, the Agency is able to influence land use and development control issues which may adversely affect the water environment. A list of the current status of Local Authority Development Plans is given in Appendix 1.

Improvements in water quality have enabled a coarse fishery to become established in the River Douglas, mainly in the Appley Bridge area. However, coarse fisheries within the rest of the catchment remain limited. Other recreational pursuits within the catchment include canoeing, boating, rambling, cycling and bird watching.

RIVINGTON RESERVOIR

4.0 SUMMARY OF PROGRESS

This first annual review clearly indicates the positive achievements made as part of the Douglas Catchment Management Planning process.

A large percentage of the actions designated for 1995/96 have been completed. In some cases amendments to the issues have been made to reflect changes in legislation, policy or resource allocation.

Water quality issues 7-16 in the Douglas Final Report (February 1995) have been relocated to Section 6.0 of this document where they are shown as new issues in the light of the new water quality objective scheme. Your comments on these issues are welcomed and should be addressed to the Environment Planner to arrive no later than Friday 28 March 1997.

SECTION 5.0

PROGRESS REPORT

KEY

EA	-	Environment Agency
LA	-	Local Authority
RO	-	Riparian Owner
MAFF	-	Ministry of Agriculture Fisheries and Food
NWW	-	North West Water Ltd
GMAU	-	Greater Manchester Archeological Unit
LAU	-	Lancashire Archeological Unit
FA	-	Forestry Authority
FWAG	-	Farm Wildlife Advisory Group
HOT	-	Hawk and Owl Trust
EN	-	English Nature
RSPB	-	Royal Society for the Protection of Birds
ADAS	-	Agricultural Development Advisory Unit
LWT	-	Lancashire Wildlife Trust

*		Denotes action is now complete and will be removed from future reviews
**	Bold:	Denotes a new/changed issue

Original issues 7-16 (Douglas Final Report February 1995) have been replaced by new issues generated as a result of water quality objectives review. See Section 6.0 for the new issues which have now been renumbered.

____ completion of action

..... ongoing action

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
CW1 *	Impact of development on the water environment.	List of standard comments to be drawn up for use by EA in line with local authority requirments.	EA	LA	Staff costs not identifiable	—	—					National standard paragraphs for planning respones compiled 1995. These paragraphs were introduced to the North West planning system in May 1995.
		Improve quality of responses to planning consultations in order to ensure the Agency interests are safeguarded.	EA	LA								As part of the EA's continuing liasion with Local Planning Authorities, the EA is ensuring that its responses are continually improved.
CW2 *	The effective and efficient allocation of resources in the maintenance of main river	Undertake a Standard of Service survey.	EA		£250,000 for Region	—						Survey completed July 1995. The maintenance programme is now being adjusted to reflect the findings.
CW3	Inadequate access to river corridors for improvement and maintenance works.	Enforce current legislation and ensure local authorities, developers and riparian owners are aware of the need to keep river corridors free from development.	EA	LA RO	£50,000 for 3 ramps			—				Sites for ramps being identified and surveys to be completed in 1996
		Urban access ramps to be installed in the River Douglas at Wi[redacted].	EA						—	—		
CW4 *	Inappropriate classification of main river and ordinary watercourse.	Review main river designations. Liaise over any proposals to change main river status with appropriate authorities and organisations and MAFF for approval by the end of 1995.	EA	MAFF	EA staff costs, approx. £10,000	—	—					Preliminary review of the catchment completed early 1995. A detailed study is on-going.
CW5 *	Lack of baseline information about fish populations including fish species, numbers and distribution .	Undertake further detailed surveys in 1995 as part of the strategic stock assessment programme to supplement the initial baseline survey carried out during 1991.	EA	-	£25,000		—					Full fisheries survey of the catchment undertaken in 1995. Report of survey completed.
CW6 *	The presence of physical structures which may hinder or prevent the free movement of fish.	Identify physical obstructions by the end of 1995. Carry out remedial works where appropriate.	EA	-	£1,000 to identify barriers only.		—					All physical barriers preventing free movement of fish identified. These are detailed in the Fish Survey Report.

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
CW7	Development and improvement of coarse fisheries by means of establishing new restocking techniques.	Experimental stocking of chub from the Agency's Leyland Coarse Fish Farm have already taken place in 1992. Further experiemental stockings to be carried out from 1995.	EA	–	£17,500		—		—			1. An experimental stocking of chub, reared at Leyland Fish Farm was carried out in 1995. The results are included in the EA's Fish Survey Report. 2. A national R&D project, "Survival and Dispersal of Stocked Coarse Fish" is to be carried out, in part, on the River Lostock. This will involve restocking from the Leyland Fish Farm. The study will commence November 1996.
CW8	Invasive plant species.	Draw up detailed plans of location of Japanese Knotweed and Himalayan Balsam.	EA		£1,200					—	———	Data available on location of Japanese Knotweed and Himalayan Balsam but the detailed plan has not yet been compiled due to re-allocation of resources.
		Produce a detailed strategy for combating spread and eventual elimination of the species.	EA	LA	£2,000					—	———	R & D Project 294, "Control of Invasive Riparian & Aquatic Weeds" produced August 1994 as part of a national initiative.
		Secure co-funding partnerships with local authorites.	EA	LA	Unknown					—	———	Survey and location of invasive species recorded on strategic corridor survey. Allocation of resources have not been available therefore rescheduled for 1998.

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
CW9	Litter and aesthetic quality of watercourses. Rivers and streams throughout the catchment accumulate large quantities of rubbish. This is particularly prevalent in the urban areas and may result in blockages and a risk of flooding in culverts and places a high demand on manpower resources	Liaise with local authority to agree watercourses requiring action. Liaise with local pressure groups/local authorities or NWW (depending on source of litter) to organise teams capable of removing litter. Produce leaflets documenting the nuisance litter causes and distribute to local groups, businesses, public, encouraging voluntary groups to move rubbish .	EA/ LA EA EA	 NWW LG LG	£37,000			—	—	—		A three day litter removal exercise has been completed on both the River Tawd and Close Brook in Wigan.
CW10	The need to preserve archaeological remains.	Prepare database of important sites. Carry out consultation with Lancashire Archaeological Unit and Greater Manchester Archaeological Unit.	EA EA	 LAU/ GMAU	£3,000	—						Database of important archaeological sites set up 1993. Standard procedures for consultations established 1993.
CW11	The lack of natural channel features, meanders and marginal wet ledges in the more intensively managed length of the Douglas.	All maintenance and capital work to contain features to protect and promote nature conservation as appropriate. Carry out an investigation into alternative bank stabilisation techniques whuch achieve engineering aims and promote conservation.	EA EA	RO LA 	Unknown £2,000	..... —	..... —	.....	.....	.....		All capital works now contain features to enhance wildlife interest, where possible. As part of a national iniative, two national projects have been developed: River Bank Erosion Problems (R&D Note 204) - recommendations for their management; and Bank Erosion on Navigable Waterways (Project 204). Promotion of conservation ongoing.

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
CW12 *	Conservation potential of bankside vegetation	All areas of bankside vegetation of high conservation value to be identified by the end of 1994.	EA		£1,200	—						Survey completed 1992.
		Protect existing bank side vegetation of high conservation value. Promote the enhancement of poorer areas of bankside vegetation by ensuring that all EA works are carried out sympathetically.	EA	RO LA	Unknown	.....	.....	.....	.....	.....		Ongoing.
CW13 *	Poor vegetation in channels.	Increase in natural channel where opportunity arises.	EA	RO	Unknown	.....	.....	.....	.....	.....		Ongoing as part of routine works.
CW14	Maintenance and improvement of trees and tree cover.	Support riverside tree planting schemes, where appropriate. Promote tree planting and maintenance with landowners.	FA	EA LA RO	Set up costs £2000 Running costs unknown							No schemes currently active.
CW15	The impact of mowing regimes and their effect on wildlife.	Review and standardise EA mowing regimes to be implemented by end of 1998.	EA			—	—	—	—	—		A mowing regime plan has been produced for the Crossens catchment and this is now under discussion. Subsequent to agreements reached, the plan will be extended to include the Douglas catchment. See issue CW16.
		Further promote good mowing practice amongst landowners.	EA	RO	£7,000							
CW16	The protection and improvement of the native barn owls population.	Promote the barn owl population of West Lancs area.	LWT	EA RO		—	—	—	—	—		The EA's recommendations for the creation of 6m field margins, adjacent to watercourses, has been incorpoated into the Countryside Stewardship targets. As part of this, the Douglas catchment has been identified as a priority area. The creation of unmanaged strips alongside watercourses will encourage the developmet of the barn owl's natural prey population and thence of the barn owls themselves. Promotion is ongoing.
		Promote mowing regimes that will encourage small rodent populations and hence barn owl populations.	EA	RO	Unknown (Likely to be about £5,000)	—	—	—	—	—		
		Link in with existing barn owl promotion schemes. Promote new projects as appropriate.	EA	FWAG LWT HOT		—	—					

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
CW17	Regeneration of urban watercourses. Unknown	Develop a five year strategy for the the regeneration of urban watercourses within the Lostock and Yarrow sub-catchments. Develop a five year strategy for the regeneration of urban watercourses within the upper Douglas area (i.e. that area covered upstream of confluence with the River Yarrow).	EA EA	LA LA	Unknown			——	——	——	———	Promotion is ongoing
CW18	Identification of recreational needs and opportunites and determination of the EA's recreational role.	Consult further with other organisations to identify the recreational needs and opportunies of the catchment by end of 1995. Identify the role to be played by the EA in promoting recreation. Ensure appropriate liaison with interested parties.	EA		Unknown	——	——					On-going promotion as opportunities arise in line with EA's strategy for recreation.
CW19	Effectiveness of existing set-aside scheme for agricultural land.	Produce a report detailing the locations for potential set-aside shemes to provide corridors along watercourses for conservation and access for general maintenance.	EA	MAFF ADAS	£2,000	——	——	——				Awaiting results of Swanside set-aside scheme. These will be assessed and the success, or otherwise, of this scheme will determine whether a similar scheme will be implemented in the Douglas catchment.

Site specific details

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
SS1	Slippage problems affecting 2.5km of earthern tidal embankments along the lower reaches of the River Douglas in the Much Hoole, Tarleton and Becconsall areas.	Capital invetsment of £489,000 between July/August 1992 and March 1995. Method adopted for long term stabilisation involves the construction of large stone revetment systems placed in the toe and lower batter slopes of the river channel.	EA		£500,000	—	—					Final phase of capital investment completed March 1995.
SS2	Low lying property behind defences at Wigan and Croston could be flooded during exceptionally high river flows. No formal flood risk zones exist at these problem locations.	Establish formal flood warning procedures for incorporation into the Regional Flood Warning Scheme.	EA		EA staff costs and consultants approx £15,000	—	—					Flood warning zones established for Croston (completed July 1994) and for Wigan (completed January 1995).
		**** Develop Flood Warning Dissemination for formally designated Flood Warning Zones.**	EA					—				Flood warning dissemination now formally accepted as part of EA duties as of 1st September 1996.
SS3	Inadequate safety provision at seven debris screen sites on main river.	Capital investment of £13,000 to improve debris screen safety. Capital Project due for completion by 1995.	EA		£13,000	—	—					Capital project completed 1995. Debris screen safety improved at two sites on Carr Brook, two sites on Ince Brook, on Smithy Brook and on Eyes Lane and Croston Park watercourses.
SS4	Reduced capacity and effectiveness of pumping stations at Croston and Mawdesley due to peat shrinkage.	Carry out a suvey of the drainage system and pumping stations, to provide physical information and to examine condition, operational efficiency and life expectancy.	EA		£1,000,000 budgeted for overall costs	—	—	—	—			Initial Phase has slipped back due to reduced capital spending for flood defence. The time table has been altered accordingly.
		Investigate the levels of flood protection afforded within the pumped catchments with a view to prioritising and phasing improvments.	EA					—	—			
		Carry out a survey of ecological and conservation impacts to address environmental issues.	EA						—	—		Work to be completed as per timetable.
		Capital Project programmed for implementation in 1992/2000.	EA								1999/ 2000	

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
SS5	Potential low flows downstream of Scholes Weir (Wigan) due to abstraction by British Waterways to feed the Leeds/Liverpool Canal.	Increase compensation water from Rivington Reservoir or other sources onto the River Douglas.	EA	NWW	Cost Unknown	—	—	—	—	—		Negotiations ongoing.
		Fit a residual flow device to Scholes Weir.	BWB		No cost to EA	—	—					A spacer was installed in June 1995 on the sluice gate of Scholes Weir in !995. This allows 27 Ml/D to be discharged into the river below the weir at all times.
		Implement the agreement details with British Waterways that no abstarction from the River Douglas will take place when the flow over Scholes Weir falls below 27Ml/day.	EA/ BWB		No cost to EA	—	—					Agreement between EA and BWB reached in March 1994 to allow a residual flow to be discharged into the River Douglas,below the abstraction point at Scholes Weir.
SS6	Potential low flows downstream of Gathurst Weir leading to the reduced dilution of Hoscar WwTW discharge , as a result of abstarction to feed the Leeds/Liverpool Canal .	Increase compensation water from Rivington Reservoir or other sources into the River Douglas.	EA	NWW		—	—	—	—	—		Negotiations ongoing.
		Implement the agreement details with British Waterways that no abtraction from the River Douglas will that place when the flow over Gathurst Weir falls below 30Ml/d.	EA/ BWB		Maximum of £10,000	—	—					Agreement between EA and BWB reached in March 1994 to allow a residual flow to be discharged into the River Douglas,below the abstraction point at Gathurst Weir. A notch in the crest of the weir which, when full, is to equivalent of 30Ml/d. BWB have agreed that the feeder sluice will be restricted to ensure that the notch is full at all times.
		Additional flow measurement instrumentation in feeder from Douglas to BWB for licence enforcement.						—	—			Additional instrumentation to measure level over weir to ensure 20Ml/d.

No.	ISSUE	ACTIONS	RESPONSIBILITY		ESTIMATED COST	'94	'95	'96	'97	'98	FUTURE	PROGRESS
			LEAD	OTHER								
SS7	**** Development of Flash complex as a recreational and wildlife resource.**	**** To undertake a study of the Flashes, Ince Brook and Hawkley Brook.** **Undertake a fisheries survey of the Flashes.**	EA EA	Wigan MBC RSPB EN GMEU	Staff costs	.....	.....	.....	.....	.....		Survey completed. Ongoing development with active consultation and partnerships. Identifies problem areas such as blue green algae, and water quality problems which may limit the use of the Flashes as a recreational/wildlife resource. Indentifies current status of the fish stocks.

SECTION 6.0

NEW WATER QUALITY OBJECTIVE SCHEME AND REVISED ISSUES

The original Douglas Catchment Management Plan expressed long term water quality planning targets in terms of the National Water Council (NWC) classification scheme. This scheme has now been replaced with the Water Quality Objective (WQO) scheme. The background to the new scheme is outlined below.

The major consequence of the change, is that all the NWC objectives for the Douglas catchment have now been translated into the new WQOs. These translated objectives are presented in this section for comment. In addition the key issues affecting compliance with the new objectives are also presented.

The Environment Agency would welcome any comments on the new WQOs and the associated issues. Please forward them to the Environment Planner no later than Friday 28†February 1997.

Overview of the WQO scheme

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 exists 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 WQO scheme is initially being applied only to rivers and canals. Schemes for other controlled waters are also under development.

The new WQO scheme can essentially be considered in two parts :-

Short to medium term River Ecosystem Water Quality Objectives
Long term River Ecosystem Water Quality Objectives.

Short to Medium Term River Ecosystem Water Quality Objectives

Descriptions for the five River Ecosystem Use classes, the quality criteria for which are given in Appendix 2, are given below:

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

Waters not achieving class RE5 are of bad quality (in which fish are unlikely to be present)

Every classified stretch in the Douglas catchment has been set a short to medium term water quality objective (RQO) comprising a River Ecosystem class and an associated target date. Where an objective has been set in order to prevent deterioration of present water quality the objective applies with immediate effect and target dates for these stretches are set for the first year of compliance assessment i.e. 1997. For the other stretches, target dates have been set to coincide with completion of capital works or farm campaigns by Environment Agency Pollution Control staff etc. for example RE4(2000). This indicates RE4 should be attained by the year 2000.

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 trialled nationally), further formal consultation will take place. Once in force the Environment 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.

The short to medium term River Ecosystem targets proposed in this report have been set by taking into consideration the investment that is committed to take place over the next five years. Where a river stretch receives a discharge from a wastewater treatment works (WwTW) and no investment is planned, River Ecosystem objectives have to take account of the existing conditions attached to the consent to discharge. This can lead to a situation where the short to medium objective is worse than the present quality. Thus if the quality of the effluent discharged from Longton WwTW was to deteriorate to the level reflected in its consent to discharge, water quality downstream would be poorer than River Ecosystem class 5.

Long Term River Ecosystem Water Quality Objectives.

Since 1989 the Environment Agency and it's predecessor organisations have been 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.

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.

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 Environment Agency is committed to seeking improvements in line with the earlier policy and in this respect long term River Ecosystem objectives have also been proposed for all classified stretches in the Douglas catchment.

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	1
1B	2
2	3 or 4
3	5
4	

Thus, to an extent the long term objectives are translations of the original objectives set in 1979.

COMPLIANCE ASSESSMENT OF RIVER STRETCHES COMPARED TO LONG AND SHORT TERM OBJECTIVES

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Douglas	Wigan/Skelmersdale WwTW to Douglas SD 482 119 - SD 468 157	4.6	No Class	Complies	RE4	Significant failure	1
Douglas	Crooke to Wigan/Skelmersdale WwTW SD 543 073 - SD 482 119	10.5	RE3	Complies	RE3	Complies	
Douglas	Poolstock Bk to Crooke SD 574 050 - SD 543 073	4.5	RE5	Complies	RE4	Marginal failure	1
Douglas	Pearl Bk to Poolstock Bk SD 622 110 - SD 574 050	15.5	RE5	Complies	RE4	Significant failure	1,3
Douglas	Squirrel Bridge to Pearl Bk SD 631 121 - SD 622 110	1.6	RE3	Complies	RE3	Complies	

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Douglas	Douglas Old Lord's Heath to Squirrel Bridge SD 642 128 - SD 631 121	1.5	RE2	Complies	RE1	Significant failure	8
Longton Bk	Longton/Hutton to FWL SD 488 262 - SD 462 262	2.9	RE4	Complies	RE3	Marginal failure	2,8
Tarra Carr Gutter	Longton WwTW to FWL SD 469 253 - SD 459 250	1.1	No Class	Complies	RE4	Significant failure	1,2,3
Carr Bk	Doles Lane to FWL SD 482 221 - SD 460 215	2.8	No Class	Complies	RE4	Significant failure	2,8
Lostock	Leyland WwTW to Yarrow SD 521 208 - SD 477 188	10.2	RE5	Complies	RE3	Marginal failure	1,3
Lostock	M6 to Leyland WwTW SD 566 248 - SD 521 208	7.6	RE3(2000)	Marginal failure	RE3	Marginal failure	4,5,6, 9
Lostock	Withnell Fold to M6 SD 612 234 - SD 566 248	6.4	RE4	Complies	RE3	Significant failure	5
Wymott Bk	Ormskirk/Preston railway to Lostock SD 497 210 - SD 488 197	1.8	RE3	Complies	RE3	Complies	
Mill (Bannister) Bk	Bow Bk to Lostock SD 550 225 - SD 524 214	3.5	RE4(2000)	Significant failure	RE4	Significant failure	4,5

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Bow Bk	A49 to Mill Bk SD 556 225 - SD 550 225	0.6	RE4	Complies	RE4	Complies	
Wade Bk	Buckshaw Bk to Mill Bk SD 554 205 - SD 525 213	3.3	RE3(2000)	Complies	RE3	Complies	4 *1
Carr Bk	B5256 to Lostock SD 580 233 - SD 577 217	1.9	RE4(1998)	Complies	RE4	Complies	
Eller Bk (Douglas)	Westhead/Lathom Road to Douglas SD 446 078 - SD 467 149	9.9	RE5	Complies	RE4	Marginal failure	1,2
Tawd	A5209 to Douglas SD 469 104 - SD 477 125	2.5	RE4(1999)	Marginal failure	RE4	Marginal failure	5,6
Tawd	Pimbo Industrial Estate to A5209 SD 487 056 - SD 469 104	2.8	RE4(1999)	Marginal failure	RE4	Marginal failure	5,6
Slate Bk	Lathom Research Lab to Douglas SD 467 088 - SD 472 095	1.4	RE4	Complies	RE4	Complies	
Calico Bk	Skull House Lane to Douglas SD 528 098 - SD 525 091	0.8	RE4(1999)	Marginal failure	RE4	Marginal failure	8
Dean Bk	A577 to Douglas SD 526 051 - SD 535 075	2.8	RE3	Complies	RE3	Complies	

*1 Although the stretch complies with it's long term objective at the current time, this compliance cannot be assured until completion of a NWW Ltd scheme to improve the combined sewer overflows in the Leyland area - see issue 4 (Mill/Bannister Brook) for further information.

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Poolstock Bk	Smithy Bk to Douglas SD 575 048 - SD 574 050	0.4	RE4	Complies	RE4	Complies	
Poolstock Bk	Pearson's Flash to Smithy Bk SD 582 038 - SD 575 048	1.3	RE4	Significant failure	RE4	Significant failure	4
Ince Bk	Wigan Road to Pearson's Flash SD 604 051 - SD 582 038	2.7	RE4(1999)	Significant failure	RE4	Significant failure	4
Smithy Bk	Summersales to Poolstock Bk SD 551 035 - SD 574 047	3.4	RE5	Complies	RE4	Significant failure	5,6,7
Yellow Bk	Aspull Sough to Douglas SD 590 071 - SD 587 070	0.4	RE4	Complies	RE4	Complies	7 *2
Buckhow Bk	Rigby's Bridge to Douglas SD 538 122 - SD 585 111	6.8	RE4	Complies	RE3	Marginal failure	2,8
Pearl Bk	B5238 to Horwich WwTW SD 6270 1085 - SD 623 110	0.5	RE4	Complies	RE4	Complies	
Pearl Bk	Horwich WwTW to Douglas SD 623 110 - SD 6214 1102	0.2	No Class	Complies	RE4	Significant failure	1,3
Leeds-Liverpool Canal	Burscough Bridge to Douglas SD 451 115 - SD 456 215	11.4	RE4	Complies	RE4	Complies	
Leeds-Liverpool Canal	Halsall to Leigh Branch, Wigan SD 375 099 - SD 583 049	24.9	RE4	Complies	RE3	Complies	

*2 Although the stretch complies with it's long term objective at the current time, this stretch is also significantly affected by minewater discharges - see issue 7 for further information.

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Leeds-Liverpool Canal	Leigh Branch to Johnsons Hillock SD 583 049 - SD 592 210	17.9	RE4	Complies	RE4	Complies	
Leeds-Liverpool Canal	Dover Bridge to Main Canal, Wigan SD 608 008 - SD 583 049	5.8	RE4	Complies	RE4	Complies	
Yarrow	Culbeck Bk to Douglas SD 522 181 - SD 466 187	7	RE4(1998)	Complies	RE4	Complies	1 *3
Yarrow	Chorley WwTW to Culbeck Bk SD 564 173 - SD 522 181	5.9	RE4(1998)	Complies	RE4	Complies	1 *3
Yarrow	Black Bk to Chorley WwTW SD 592 162 - SD 564 173	9.1	RE5	Complies	RE4	Marginal failure	4,8
Yarrow	Rivington Reservoir to Black Bk SD 621 145 - SD 592 162	5.2	RE4	Complies	RE2	Significant failure	4,8,9
Syd Bk	Wrightington Bar to Yarrow SD 537 133 - SD 501 179	8.5	RE4	Complies	RE3	Marginal failure	4,7,8, 9
Culbeck Bk	Woodcock Fold to Yarrow SD 570 192 - SD 523 181	5.7	RE3	Complies	RE3	Complies	
River Chor	A6 Road Bridge to Yarrow SD 583 179 - SD 567 170	2.7	RE3(2000)	Complies	RE3	Complies	4 *4

*3 Although the stretch complies with it's long term objective at the current time, this compliance cannot be assured until completion of a NWW Ltd scheme to improve Chorley WwTW - see issue 1 for further information.

*4 Although the stretch complies with it's long term objective at the current time, this compliance cannot be assured until completion of a NWW Ltd scheme to improve the combined sewer overflows in the area of Astley Park - see issue 4 for further information.

RIVER	STRETCH (FROM/TO) NGR (FROM/TO)	LENGTH (KM)	SHORT TERM OBJECTIVE	COMPLIANCE	LONG TERM OBJECTIVE	COMPLIANCE	ISSUE (6.1-6.9)
Clancutt Bk	B5251 to Yarrow SD 559 140 - SD 569 153	2.6	RE3	Complies	RE2	Marginal failure	4,6,8
Eller Bk (Yarrow)	Leeds - Liverpool Canal toYarrow SD 596 139 - SD 581 141	2.3	RE5	Complies	RE4	Marginal failure	8
Black Bk	The Goit to Yarrow SD 614 191 - SD 592 163	5.1	RE3	Complies	RE3	Complies	
Brinscall Bk	Mod site to Balck Bk SD 615 203 - SD 614 191	1.5	RE3	Complies	RE3	Complies	

6.1 IMPACT OF EFFLUENT FROM NORTH WEST WATER LTD (NWW LTD) WASTEWATER TREATMENT WORKS

River Douglas and Pearl Bk - Horwich WwTW

Failures to meet objectives:

Significant failure to meet the long term objective of RE4 in Pearl Bk downstream of Horwich WwTW for ammonia. The discharge from Horwich WwTW is the cause of this failure.

Significant failure to meet the long term objective of RE4 in the River Douglas from Pearl Bk to Poolstock Bk for ammonia. The discharge from Horwich WwTW is the cause of this failure.

Marginal failure to meet the long term objective of RE4 in the River Douglas from Poolstock Bk to Crooke for BOD and ammonia. The discharge from Horwich WwTW contributes to this failure.

Horwich WwTW receives a trade effluent containing a considerable amount of ammonia. As a result of a drought order agreement originally agreed between the National Rivers Authority (NRA), one of the Environment Agency's predecessor organisations, and NWW Ltd the compensation flow from Rivington Reservoir to the River Douglas could be reduced for a six month period which ended on the 24 October 1996. In order to ensure water quality downstream did not deteriorate as a result of the reduced upstream dilution NWW Ltd, agreed to tanker away the high strength trade effluent and comply with an ammonia consent of 20 mg/l at the works, subsequently tightened to 15 mg/l until the end of the drought order period. It has been agreed with NWW Ltd, that the ammonia standard can be reviewed 12 months after cessation of the drought order, i.e. not before Ocober 1997.

The treated effluent from Horwich WwTW is also thought to significantly contribute to elevated concentrations of phosphate in the River Douglas and Leeds-Liverpool Canal (which uses water abstracted from the Douglas at Scholes Weir in Wigan and Gathurst Weir in Appleby). Eutrophic conditions are observed downstream of the works, particularly in the canal with prolific growth of algae resulting in unsightly blooms.

The EU Urban Waste Water Treatment (UWWT) Directive (91/271/EEC) allows for waters identified as being eutrophic and receiving "qualifying" WwTW discharges to be designated as Sensitive Areas (eutrophic). On 10th May 1994 the River Douglas from Horwich WwTW (SD 663 110) to Scholes Weir (SD 586 053) and the Leeds-Liverpool Canal from Dover Bridge in Wigan to Liverpool were designated as Sensitive Areas (eutrophic) and phosphorus removal to the standards specified in the Directive will be required at Horwich WwTW by 31 December 1998 unless it can be demonstrated that this will have no effect upon the level of eutrophication.

River Douglas and Pearl Bk - Horwich WwTW

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Install additional treatment at Horwich WwTW	NWW Ltd	Improved water quality. Achievement of water quality objectives for Pearl Bk and River Douglas downstream of Pearl Bk.	2000+
Install phosphate removal plant at Horwich WwTW.	NWW Ltd	Improved water quality. Compliance with UWWT directive.	1998

Constraints : Costs/AMP2

Eller Brook (Douglas) - Westhead WwTW

Failures to meet objectives:

Marginal failure to meet the long term objective of RE4 in Eller Bk downstream of Westhead WwTW to the Douglas for BOD.

The secondary treated effluent discharged from Westhead WwTW contributes to the failure. NWW Ltd have no plans to improve this effluent in the next 10 years.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Install additional treatment at Westhead WwTW	NWW Ltd	Improved water quality. Achievement of water quality objectives for Eller Bk downstream of Westhead WwTW.	2000+

Constraints : Costs/AMP2

River Douglas - Wigan WwTW and Skelmersdale WwTW

Failures to meet objectives:

Significant failure to meet the long term objective of RE4 in the River Douglas downstream of Wigan WwTW to Wanes Blades Bridge for BOD and ammonia and marginal failure to meet the same objective for dissolved oxygen.

The secondary treated effluents discharged from Wigan WwTW and Skelmersdale WwTW are the cause of this failure. NWW Ltd have no plans to upgrade these works in the next 10 years.

Recent improvements to Preston WwTW has significantly reduced the ammonia load discharged to the Ribble Estuary. To ensure this improvement is not offset by an increase in ammonia concentration discharged from Wigan WwTW, NWW Ltd have agreed to a review of the consent for Wigan WwTW to include an ammonia standard of 10 mg/l. This should ensure that there is no future significant increase in the ammonia load discharged from this works to the Douglas and ultimately the Ribble Estuary.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Install additional treatment at Wigan WwTW	NWW Ltd	Improved water quality. Achievement of water quality objectives for River Douglas downstream of Wigan WwTW.	2000+
Consent Wigan WwTW for ammonia to reflect current load discharged.	Environment Agency/NWW Ltd	Ensure no future increase in ammonia concentrations in the Ribble estuary as a result of increased ammonia load from Wigan WwTW.	1996

Constraints : Costs/AMP2

River Lostock Leyland WwTW

Failures to meet objectives:

Marginal failure to meet the long term objective of RE3 in the River Lostock downstream of Leyland WwTW to the River Yarrow for unionised ammonia.

The secondary treated effluent discharged from Leyland WwTW is the cause of this failure. Whilst ammonia levels are relatively low, high summer pH results cause a higher proportion of the ammonia to be present in the toxic unionised form. Leyland WwTW effluent is thought to significantly contribute to the elevated concentrations of phosphate and the potential eutrophic state of the River Lostock below the WwTW. Elevated pH is a recognised symptom of eutrophication.

The EU Urban Waste Water Treatment (UWWT) Directive (91/271/EEC) allows for waters identified as being eutrophic and receiving "qualifying" WwTW discharges to be designated as Sensitive Areas (eutrophic). The River Lostock above and below Leyland WwTW is currently being monitored with a view to identifying the nutrient status and any evidence of eutrophication within the watercourse. A decision on designation of a section of the Lostock as a Sensitive Area will be taken in 1997. If the Lostock is designated as a Sensitive Area, phosphorus removal to the standards specified in the Directive will be required at Leyland WwTW by 2004 unless it can be proved that this will have no effect upon the level of eutrophication.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Continue monitoring nutrient load from Leyland WwTW and potential eutrophic effects downstream.	Environment Agency	Improved information on eutrophic state of Lostock below Leyland WwTW.	Ongoing
Possible inclusion of phosphate removal plant at Leyland WwTW.	NWW Ltd	Improved water quality. Compliance with UWWT Directive.	1997+

Constraints : Costs/AMP2

River Yarrow - Chorley WwTW

The River Yarrow below Chorley WwTW currently complies with it's long term objective of RE4. However fish stocks below the works are poor, possibly as a result of the intermittent discharge of non-nitrified effluent from the WwTW.

NWW Ltd plan to improve the operation and performance of the WwTW to enable compliance with more stringent consent conditions by the end of 1997.

The EU Urban Waste Water Treatment (UWWT) Directive (91/271/EEC) allows for waters identified as being eutrophic and receiving "qualifying" WwTW discharges to be designated as Sensitive Areas (eutrophic). The River Yarrow above and below Chorley WwTW is currently being monitored with a view to identifying the nutrient status and any evidence of eutrophication within the watercourse. A decision on designation of a section of the Yarrow as a Sensitive Area will be taken in 1997. If the Yarrow is designated as a Sensitive Area, phosphorus removal to the standards specified in the Directive will be required at Chorley WwTW by 2004 unless it can be proved that this will have no effect upon the level of eutrophication.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Install additional treatment at Chorley WwTW	NWW Ltd	Secure improved water quality. Maintenance of water quality objectives for River Yarrow downstream of Chorley WwTW.	1997
Possible inclusion of phosphate removal plant at Chorley WwTW	NWW Ltd	Improved water quality. Compliance with UWWT Directive	1997+

Constraints : Costs/AMP2

Tarra Carr Gutter - Longton WwTW

Failures to meet objectives:

Significant failure to meet the long term objective of RE4 in Tarra Carr Gutter downstream of Longton WwTW for BOD.

The secondary treated effluent discharged from Longton WwTW contributes to this failure. NWW Ltd have no plans to improve this effluent in the next 10 years.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Install additional treatment at Longton WwTW.	NWW Ltd	Improved water quality. Achievement of water quality objectives for Longton Bk.	2000+

Constraints : Costs/AMP2

6.2 IMPACT OF PRIVATE SEWAGE TREATMENT WORKS

In rural areas many properties are not connected to the foul drainage network. Instead domestic waste is piped to a private sewage treatment works before discharge to the nearest watercourse. These private sewage treatment works are of varying complexity ranging from septic tanks up to systems providing full biological treatment. The sewage treatment works is usually the responsibility of the individual householder or company.

Inadequate design or maintenance of the sewage treatment works can lead to poorly treated sewage entering watercourses. In rural areas these watercourses are often very small and the polluting impact from private sewage treatment works can be significant.

Section 101A of the Water Industry Act 1991 has recently been enacted by schedule 22 of the Environment Act 1995. This imposes a duty on the sewerage undertaker (NWW Ltd) to provide a public foul sewer in currently unsewered areas. However there is no automatic requirement on the sewerage undertaker to provide a public sewer under the new duty. The duty arises in areas where there are environmental or amenity problems occurring or likely to occur from the existing arrangements for dealing with sewage. The sewerage undertaker must also respond to approaches from any interested party eg. the public or local authorities, with regard to provision of a foul sewer. In addition it must be shown that provision of a new public sewer is the appropriate and most cost-effective solution.

Stretches where private sewage treatment works contribute to a failure to meet objectives:-

i) Marginal failure to meet the long term objective of RE3 in Longton Bk for BOD.

ii) Significant failure to meet the long term objective of RE4 in Tarra Carr Gutter for BOD.

iii) Significant failure to meet the long term objective of RE4 in Carr Bk (Douglas) for BOD and dissolved oxygen and marginal failure to meet the same objective for ammonia.

iv) Marginal failure to meet the long term objective of RE4 in Eller Bk (Douglas) for BOD.

v) Marginal failure to meet the long term objective of RE3 in Buckhow Bk for dissolved oxygen and unionised ammonia.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with works owners to ensure appropriate methods of treatment and regular maintenance are employed.	Environment Agency	Improved water quality. Achievement of long term water quality objective.	Ongoing
Liaise with NWW Ltd and Local Authorities/Private Householders in identifying unsewered areas requiring provision of a public foul sewer.	Environment Agency/ NWW Ltd/Local Authority/ Householders	List of those areas requiring a public foul sewer.	1997+
Provide public foul sewer in identified areas.	NWW Ltd	Improved water and aesthetic quality. Achievement of long term water quality objective.	1997+

Constraints : Costs/Co-operation/Resources

6.3 IMPACT OF OVER-PERFORMING NWW LTD WASTE-WATER TREATMENT WORKS

The short to medium term River Ecosystem targets proposed in this report have been set by taking into consideration the investment that is committed to take place over the next five years. Where a river stretch receives a discharge from a wastewater treatment works (WwTW) and no investment is planned, River Ecosystem objectives have to take account of the existing conditions attached to the consent to discharge. This can lead to a situation where the short to medium objective is worse than the present quality. Thus if the quality of the effluent discharged was to deteriorate to the level reflected in its consent to discharge, water quality downstream would be poorer than the existing water quality.

Were NWW Ltd to agree to a review of the consents for over-performing WwTWs to reflect current performance it would be possible in some cases to set more stringent short to medium objectives to protect water quality.

Stretches affected by over-performing WwTW discharges:-

i) River Lostock downstream of Leyland WwTW. Current water quality complies with RE4.

If the discharge from Leyland WwTW deteriorated to it's full consented BOD load, water quality downstream of the works would deteriorate to RE5.

ii) Pearl Bk downstream of Horwich WwTW and River Douglas downstream of Pearl Bk. Current water quality only complies with RE5 due to ammonia discharged from the works.

Discussions on methods of reducing the concentration of ammonia in the WwTWs effluent are currently on-going between the Environment Agency and NWW Ltd. However, if the WwTW was to deteriorate to it's current full consented BOD load, then water quality in Pearl Bk would deteriorate to worse than RE5 and water quality in the Douglas downstream of Pearl Bk would only comply with RE5. The short to medium term objectives have therefore been set not only to reflect the current ammonia load discharged but also the potential for deterioration of the effluent BOD load.

iii) Tarra Carr Gutter downstream of Longton WwTW. Current water quality only complies with RE5.

If the discharge from Longton WwTW deteriorated to take up it's full consented BOD load then water quality downstream of the WwTW would deteriorate to quality worse than RE5.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with NWW Ltd to discuss reviewing consents for WwTWs identified above.	Environment Agency/NWW Ltd	Improved water quality. Achievement of long term water quality objective.	1996+

Constraints : AMP2

6.4 IMPACT OF OVERFLOWS FROM COMBINED SEWERAGE SYSTEMS

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 amenity value.

Sewerage systems within the catchment have been assessed both for structural integrity and impact on water quality and in certain areas Drainage Area Plans (DAPs) have been drawn up.
There are in the region of 50 unsatisfactory CSOs within the Douglas catchment requiring improvement and these have been highlighted to NWW Ltd as requiring resolution. As part of the agreed programme of work to be undertaken as part of the Asset Management Plan (AMP) 2 process, NWW Ltd plan to improve or abandon 8 of these unsatisfactory overflows by the year 2000. However, there is no planned action proposed for the remainder until beyond 2005 with expenditure for the period 2001 to 2005 being directed to other priority catchments.

Failures to meet objectives:

i) Significant failure to meet class RE4 in Ince Brook for BOD and significant failure to meet class RE4 in Poolstock Bk from Pearson's Flash to Smithy Brook for BOD.

2 unsatisfactory overflows discharge to Ince Bk. A NWW Ltd scheme to improve these overflows should be complete before April 1998.

ii) Significant failure to meet class RE4 on Mill(Bannister) Bk for BOD and marginal failure to meet class RE3 on River Lostock from M6 to Leyland WwTW for BOD.

4 unsatisfactory overflows discharge to Mill (Bannister)Bk. A NWW Ltd scheme to improve one of these overflows should be complete before April 1997. A further NWW Ltd scheme to improve the remaining three overflows should be complete before April 1999.

iii) 2 unsatisfactory overflows discharge to the River Chor in the reach from the A6 Road Bridge to the River Yarrow. This stretch currently complies with RE3 although intermittent pollution from the overflows prevents the establishment of a fishery. In addition the aesthetic nature of the watercourse, particularly in Astley Park, is very poor due to discharges from the overflows.

A NWW Ltd scheme to improve the overflows should be complete by the end of 1999.

iv) Marginal failure to meet the long term objective of RE4 in River Yarrow from Black Bk to Chorley WwTW for BOD.

Four unsatisfactory overflows discharge to this reach of the River Yarrow. These CSOs are not due to be improved in the agreed AMP2 programme and thus there is no requirement for NWW Ltd to improve these overflows in the foreseeable future (next 10 years).

v) Significant failure to meet the long term objective of RE2 in River Yarrow from Rivington Reservoir to Black Bk for BOD and marginal failure on dissolved oxygen.

One unsatisfactory overflow discharges to this reach of the River Yarrow. In line with the AMP2 planning framework, there is no requirement for NWW Ltd to improve this overflow in the foreseeable future (next 10 years).

vi) Marginal failure to meet the long term objective of RE2 in Clancutt Bk for BOD and ammonia.

Three unsatisfactory overflows discharge to Clancutt Brook and it's tributaries. In line with the AMP2 planning framework, there is no requirement for NWW Ltd to improve these overflows in the foreseeable future (next 10 years).

vii) Marginal failure to meet the long term objective of RE3 in Syd Bk for unionised ammonia.

Three unsatisfactory overflows discharge to Syd Brook and it's tributaries. In line with the AMP2 planning framework, there is no requirement for NWW Ltd to improve these overflows in the foreseeable future (next 10 years).

Other water quality and aesthetic problems :-

Due to the intermittent nature of storm sewage overflow discharges, impact on the water quality of receiving waters is not always picked up by routine chemical sampling. In certain cases storm sewage overflow discharges are not considered to significantly impact on water quality but still cause aesthetic deterioration due to sewage litter and sewage solids being deposited in watercourses. Examples of areas where these problems occur are listed below. There are presently no plans to resolve any of these problems before 2005. For further information on the impact of sewage derived and other litter on watercourses refer to the Issue - Impact of Litter and Aesthetic Quality of Watercourses.

i) Ackhurst Brook (Douglas catchment)
ii) River Douglas at Adlington
iii) Smithy Brook (Douglas catchment)
iv) Close Brook (Douglas catchment)
v) Dean Brook (Douglas catchment)
vi) Boundary Brook (Lostock catchment)
vii) Black Brook (Yarrow catchment)
viii) Culbeck Brook (Yarrow catchment)

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Ensure completion of DAPs and implementation of solutions	NWW Ltd	Reduction in the number of unsatisfactory CSOs by capital works. Improved water quality. Improved aesthetic quality. Achievement of water quality objectives.	See Table of Schemes
Pursue further improvements to sewerage network to resolve problem of remaining unsatisfactory CSOs	Environment Agency/NWW Ltd NWW Ltd	Further reduction in the number of CSOs, or improved performance of existing CSOs. Improved water quality. Improved aesthetic quality. Achievement of water quality objectives.	2000+

Constraints : Costs/AMP2

Table of Schemes and timetable :

Scheme/Area	Watercourse(s)	Timescale
Hoscar	Ince Bk/Poolstock Bk	Complete by April 1998
Chorley	River Chor/River Yarrow	Complete by April 1999
Leyland	Mill (Bannister) Bk/River Lostock	Complete by April 1999

6.5 IMPACT OF CONTAMINATED SURFACE WATERS

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 Environment Agency in conjunction with NWW Ltd and the Local Authorities carry out site inspections to identify CSW problems. These visits allow site occupiers to be made aware of the impact on water quality and to rectify any problems.

A list of contaminated surface water discharges from NWW Ltd surface water outfalls was produced by the NRA, one of the Environment Agency's predecessor organisations, and forwarded to NWW Ltd for rectification. These CSWs were investigated over a three year period, ending in March 1995, during which time NWW Ltd 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. 30 of the CSWs originally identified to NWW Ltd are on the Douglas catchment.

In addition to the above, new CSWs have recently been identified on the Douglas catchment and these will be the subject of preliminary investigations on an individual basis by NWW Ltd. Following these investigations an agreement will be sought between the Environment Agency and NWW Ltd on a timescale for improving these CSWs.

Contaminated surface water discharges are considered to contribute to the following failures to meet objectives:

i) Significant failure to meet the long term objective of RE3 in River Lostock from Withnell Fold to M6 for unionised ammonia and marginal failure to meet the long term objective of RE3 for BOD.

ii) Marginal failure to meet class RE3 in River Lostock from M6 to Leyland WwTW for BOD.

iii) Significant failure to meet class RE4 in Mill (Bannister) Bk for BOD.

iv) Marginal failure to meet class RE4 in River Tawd from Pimbo IE to A5209 for BOD.

v) Marginal failure to meet class RE4 in River Tawd from A5209 to River Douglas for BOD.

vi) Significant failure to meet the long term objective of RE4 in Smithy Bk for BOD.

Other water quality problems :-

A number of CSW problems are not identified as causing a problem by the Environment Agency's routine river quality monitoring. They do, however, cause localised and often very noticeable problems and are the cause of frequent public complaints. Examples of watercourses where these problems occur are listed below.

i) Wrong connections discharging to Almond Brook (Douglas catchment).

ii) Wrong connections discharging to Hawkley Brook (Douglas catchment).

iii) Wrong connections discharging to a tributary of Calico Brook (Douglas catchment).

iv) Wrong connections discharging to Culbeck Brook (Yarrow catchment).

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Outstanding CSW problems from the original CSW three year project to be resolved.	NWW Ltd/Agents/ Environmental Health/Industry/ Householders	Improved water quality, resolution of CSW problems highlighted in the original project.	By end 1996
Ensure newly identified CSW problems are resolved.	NWW Ltd/Agents/ Environmental Health/Industry/ Householders	Improved water quality, resolution of new CSW problems.	Ongoing

Constraints : Costs/Resources/AMP2

6.6 IMPACT OF INDUSTRIAL ESTATES

The most significant industrial impact within the catchment results from pollution incidents arising directly from accidents, negligence and the mishandling of chemicals and oil.

There are a number of modern industrial estates particularly on the Douglas catchment and the most common problem relating to these sites arises due to the wrong connection of trade effluents, wash waters, process effluents and contaminated yard washings to the surface water system.

Industrial Estate contaminated surface water discharges are considered to contribute to the following failures to meet objectives:

i) Marginal failure to meet class RE4 in River Tawd from Pimbo Industrial Estate to A5209 for BOD and marginal failure to meet class RE4 in River Tawd from A5209 to River Douglas for BOD.

Contaminated surface water discharges from Gillibrands Industrial Estate contribute to the failures. A NWW Ltd scheme to install surface water interceptors on the industrial estate has recently been completed. The interceptors transfer a proportion of the surface water flow, which would normally be discharged to the River Tawd, to the foul sewer and this should lead to improvements in river quality.

ii) Significant failure to meet the long term objective of RE4 in Smithy Bk from Summersales to Poolstock Bk for BOD.

Contaminated surface water discharges from Lamberhead Industrial Estate are thought to contribute to this failure.

iii) Marginal failure to meet class RE3 in River Lostock from M6 to Leyland WwTW for BOD.

Contaminated surface water discharges from Moss Side Industrial Estate are thought to contribute to this failure.

iv) Marginal failure to meet the long term objective of RE2 in Clancutt Bk from B5251 Road Bridge to River Yarrow for BOD and ammonia.

Contaminated surface water discharges from Enterprise Industrial Estate are thought to contribute to this failure.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Assess impact of discharge	Environment Agency/NWW Ltd/ Owners/Occupiers	Identify actual and potential pollution	Ongoing
Survey industrial estate premises using the 'Site Right' campaign procedures	Environment Agency/NWW Ltd/ Owners/Occupiers	Increase awareness of pollution prevention	Ongoing
Carry out necessary remedial work.	Owners/Occupiers	Improved water quality. This will contribute to achievement of long term water quality objective.	Ongoing

Constraints : Costs/Co-operation/Resources

6.7 IMPACT OF MINEWATER DISCHARGES

Groundwater enters mines and has to be actively pumped to the surface to enable mining operations to continue. When the mines are closed, however, rainwater and groundwater can flood the workings and eventually this water is discharged to a river. The chemical nature of such water varies, but a common feature is the presence of a reddish-brown suspension. This is caused by iron minerals which when oxidised, precipitate out to give the characteristic ochreous deposit.

Such discharges have an aesthetic impact due to high colouration which adversely affects the amenity value of the watercourse. The build up of solids on the bed of the watercourse can deplete the insect communities and interfere with fish spawning grounds.

Landowners and former operators causing polluting discharges from abandoned mine workings are currently exempt from legislative control and not liable for clean-up costs.

Further site closures prior to 1999 will also be exempt from legislative control. However, the Environment Act 1995 makes provision for the owners of mines abandoned after 1999 to be liable for any polluting discharge made as a result of the closure.

The impact of minewater discharged from the following abandoned mines has a significant impact on watercourses in the Douglas catchment:-

i) Minewater from the former Summersales Colliery and Pemberton Spoil Heap discharging to Smithy Bk.

ii) Minewater from the former Aspull Sough Colliery discharging to Yellow Bk.

iii) Leachate from the former Welch Whittle Colliery site discharging to Syd Bk.

The Coal Authority in liaison with the Environment Agency has ranked known areas of minewater pollution, throughout England and Wales, in priority order based on the impact on the receiving watercourse. From this list scoping studies have been produced for the top ten minewater problems identified. Mining consultants employed by the Coal Authority are now working with the Environment Agency to draw up more detailed reports on the design and costs associated with proposals to remediate the top ten sites. These reports should be produced by the end of 1996. Following production of these reports, the Coal Authority will seek funding from the Department of Trade and Industry (DTi) in order to implement the solutions proposed. The Summersales Colliery site is included in the top ten sites identified.

The Environment Agency is continuing to collect data at other known areas impacted by minewater discharges that currently fall outside of the top ten sites. In addition monitoring will be undertaken wherever new minewater discharges occur in the future as a result of recently abandoned mineworkings. If funding to remediate other impacted sites becomes available in the future, then it is likely that proposed solutions and costings will be drawn up in a similar manner to that described above.

Other water quality problems :-

Other sites within the Douglas catchment are affected by ochre although not to the extent of the areas listed above.

i) Tributary of Calico Brook
ii) Bradley Brook
iii) Pearl Brook

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with Mining Consultants on production of reports identifying solutions for the Summersales site.	Environment Agency/Mining Consultants	Agreed and fully costed solution available for inspection by the DTi.	By end 1996
Implementation of agreed solution.	Coal Authority/DTi	Improved water quality and aesthetic quality.	1997+
Continued monitoring of other known minewater problems and initiation of monitoring at any future areas impacted by new minewater discharges.	Environment Agency	Provision of data-set for identification of priority areas should additional funding become available.	Ongoing

Constraints : Costs/Resources

6.8 IMPACT OF FARMING

The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1990, allows the Environment Agency to take a pro-active approach by ensuring all new farm waste management facilities are built to a specified standard. Until recently grant aid was available from the Ministry of Agriculture, Fisheries and Food for construction of waste management facilities. This grant aid is no longer available. The Code of Good Agricultural Practice provides guidance to minimise the risk of pollution.

Run off from agricultural land used for slurry spreading can result in elevated nutrient levels (nitrates and phosphates) in the river which can give rise to excessive weed growth and reductions in dissolved oxygen. Discharges of silage liquor and/or slurry to a watercourse can have serious effects e.g. fish mortalities. A number of farm surveys are carried out each year, in an attempt to identify and then remedy actual or potential farm pollution problems.

Run-off from arable farmland of fertilisers, pesticides and herbicides can have serious effects on the receiving water resulting in increased weed and algal growth (fertilisers) and fish and invertebrate mortalities (pesticides and herbicides).

The stretches listed below are those in which farming is considered to contribute to the failure of a water quality objective. However, it should be noted that it is often difficult to ascertain the effects of farming discharges and run-off on a watercourse due to the masking effect of point source discharges from WwTW etc. Although in many cases farming inputs will be contributing to the failures to meet water quality objectives the stretches should also be viewed as those most at risk from farm pollution in the catchment.

Discharges from farming are considered to contribute to the following failures to meet objectives :

i) Significant failure to meet the long term objective of RE1 in River Douglas from Old Lord's Heath to Squirrel Bridge for BOD, and a marginal failure to meet the same objective for ammonia.

ii) Marginal failure to meet the long term objective of RE3 in Longton Bk for BOD.

iii) Significant failure to meet the long term objective of RE4 in Carr Bk (Douglas) for BOD and dissolved oxygen and a marginal failure to meet the same objective for ammonia.

iv) Marginal failure to meet class RE4 on Calico Bk for BOD.

v) Marginal failure to meet the long term objective of RE3 in Buckhow Bk for dissolved oxygen and unionised ammonia.

vi) Marginal failure to meet the long term objective of RE3 on Syd Bk for unionised ammonia.

vii) Significant failure to meet the long term objective of RE2 on River Yarrow from Rivington Reservoir to Black Bk for BOD and marginal failure on dissolved oxygen for the same objective.

viii) Marginal failure to meet the long term objective of RE2 on Clancutt Bk for BOD and ammonia.

ix) Marginal failure to meet the long term objective of RE4 on Eller Bk (Yarrow) for BOD.

x) Marginal failure to meet the long term objective of RE4 on River Yarrow from Black Bk to Chorley WwTW for BOD.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Continue present pollution control initiatives	Environment Agency	Maintain and improve present water quality	Ongoing
Provide information/advice to agricultural community	Environment Agency/MAFF	Better understanding by agricultural community of pollution problems	Ongoing
Provision of "on farm" pollution prevention facilities	Farmers	Improved water quality. Achievement of water quality objectives.	Ongoing

Constraints : Costs(Farmers)/Legislation - Political Will/Resources

6.9 IMPACT OF HIGHWAY DRAINAGE

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 pollution, particularly, in heavily urbanised areas where contamination from car exhausts and pollution incidents e.g. oil spills can find their way into the highway drains.

The primary concern of the Highway Authority is the safety of road users and therefore all drainage arrangements have to be reasonably failsafe and straightforward to operate. However, Environment Agency policy is that there should be no increase in susceptibility of flooding and to maintain and where possible improve water quality. Therefore a flexible approach is adopted to determine the most appropriate methods of surface water control which satisfies the interests of both parties.

Urban drainage is considered to be particularly significant and to contribute to the following failures to meet objectives.

i) Significant failure to meet the long term objective of RE2 in River Yarrow from Rivington Reservoir to Black Bk for BOD and marginal failure to meet the same objective for dissolved oxygen..

ii) Marginal failure to meet the long term objective of RE3 in Syd Bk from Wrightington Bar to River Yarrow for unionised ammonia.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with Highways authorities to identify polluting discharges	Environment Agency/Highways authority	Provide data on discharges requiring remedial work.	Ongoing
Improve drainage arrangements (reed bed maintenance, oil interception, silt traps) to limit pollution	Highways Authority	Improved water quality. Achievement of long term water quality objective.	Ongoing

Constraints : Costs/Resources

In addition to the above, discharges of contaminated surface water from motorway construction sites containing high concentrations of silt can lead to discolouration of the receiving watercourses. In addition the silt can smother the bed of the watercourse depleting the insect community and adversely affecting fish spawning grounds.

The following watercourse is affected by discharges from motorway construction sites:-

Marginal failure to meet class RE3 in River Lostock from M6 to Leyland WwTW for BOD.

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with Motorway Contractors to ensure pollution prevention measures are taken on construction sites.	Environment Agency/Motorway Contractors	Reduction in pollution incidents arising from motorway construction sites and improved water quality.	Ongoing

Constraints : Costs/Resources

6.10 LITTER AND AESTHETIC QUALITY OF WATERCOURSES

Several watercourses on the Douglas catchment have large amounts of litter in the watercourse and on the banks. Urban drainage, discharges from combined sewer overflows and discharges from contaminated surface water overflows can all add litter and debris to a watercourse. In addition litter from tip sites, fly tipping and careless disposal of waste items by the public can result in large amounts of litter occurring at particular sites. Although litter does not generally affect chemical water quality, it can significantly reduce the aesthetic quality of a stretch of water.

Watercourses with chronic litter problems include :-

River Tawd
River Douglas in Wigan
Smithy Brook
River Chor
Clancutt Brook
Bannister Brook
Dean Brook

SOLUTIONS	RESPONSIBILITY	BENEFIT	PREFERRED TIMESCALE
Liaise with local authority to agree watercourses requiring action.	Environment Agency/Local authority	Identification of watercourses requiring clean up.	Ongoing
Liaise with local pressure groups/ local authorities or NWW Ltd (depending on source of litter) to organise teams capable of removing litter.	Environment Agency/NWW Ltd/ Local authority/Local campaign groups	Improved aesthetic appearance of watercourses.	Ongoing
Ensure compliance with NWW Ltd schemes to improve unsatisfactory CSOs	Environment Agency	Improved aesthetic appearance of watercourses and improved water quality.	Ongoing
Distribute leaflets documenting the nuisance litter causes to local groups, businesses, the public and encourage voluntary groups to remove rubbish e.g. Removal of litter from the River Tawd.	Environment Agency	Improved education concerning dumping of litter and reduction in future litter problems.	Ongoing

Constraints : Costs/Resources

APPENDICES

APPENDIX 1: CURRENT STATE OF DEVELOPMENT PLANS

Development Plan Information compiled October 1996.

LOCAL PLANNING AUTHORITY	DEVELOPMENT PLAN TITLE	STATUS AND CONSULTATION DATES	COMMENTS
Lancashire County Council	Lancashire Structure Plan	Modifications ended April 1995.	Adoption expected end 1996.
West Lancashire Borough Council	West Lancashire Local Plan	Deposit consultation ended August 1996.	Public inquiry expected Summer 1997.
South Ribble Borough Council	South Ribble Local Plan	Deposit Draft stage ended July 1995.	Public inquiry to end October 1996.
Chorley Borough Council	Chorley Local Plan	Modified Plan consultation ended December 1995.	Adpotion expected December 1996.
Wigan Metropolitan Borough Council	Wigan Unitary Development Plan UDP	Modified Plan consultation ended November 1995.	Plan adopted January 1996.
Bolton Metropolitan Borough Council	Bolton UDP	Modified Plan consultation ended September 1995	Plan adopted December 1995.

APPENDIX 2
RIVER ECOSYSTEM CLASSIFICATION: WATER QUALITY CRITERIA

Class	Dissolved Oxygen % saturation 10 percentile	Bod (ATU) mg/l 90 percentile	Total Ammonia mg N/l 90 percentile	Un-ionised Ammonia mg N/l 95 percentile	pH lower limit as 5 percentile upper limit as 95 percentile	Hardness mg/l Ca Co_3	Dissolved Copper ug/l 95 percentile	Total Zinc ug/l 95 percentile
RE1	80	2.5	0.25	0.021	6.9 - 9.0	<10 >10<50 >50 and <100 >100	5 22 40 112	30 200 300 500
RE2	70	4.0	0.6	0.021	6.0 - 9.0	<10 >10<50 >50 and <100 >100	5 22 40 112	30 200 300 500
RE3	60	6.0	1.3	0.021	6.0 - 9.0	<10 >10<50 >50 and <100 >100	5 22 40 112	300 700 1000 2000
RE4	50	8.0	2.5		6.0 - 9.0	<10 >10<50 >50 and <100 >100	5 22 40 112	300 700 1000 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) 10 percentile	Biochemical Oxygen Demand [1](ATU) mg/l 90 percentile	Ammonia (mg N/l) 90 percentile
Good	A	80	2.5	0.25
	B	70	4	0.6
Fair	C	60	6	1.3
	D	50	8	2.5
Poor	E	20	15	9.0
Bad	[2]F	-	-	-

1 as suppressed by adding allyl thio-urea

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

APPENDIX 4 - 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).

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).

District Local Plans

Statutory documents produced by District or Borough 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).

Flow Measurement Units

m3/s	Cubic metres per second
l/s	Litres per second
Ml/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

m3/s	Ml/d	mgd
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.

Local Nature Reserve

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

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.

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.)

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.

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.

WwTW

Wastewater Treatment Works.