

BLYTHE/COLE/BOURNE CATCHMENT MANAGEMENT PLAN FINAL PLAN JULY 1994



NRA
*National Rivers Authority
Severn-Trent Region*



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Front cover: *The Packhorse Bridge
over the Blythe above
Hampton in Arden.*

BLYTHE/COLE/BOURNE CATCHMENT MANAGEMENT PLAN

FINAL PLAN

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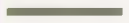




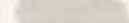

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PRINCIPAL FEATURES OF THE CATCHMENT



KEY	
	Catchment Boundary
	Sub Catchment Boundary
	Principal Water Courses
	Canal
	Motorway
	Urban Area
	Railways

1 CATCHMENT VISION FOR THE BLYTHE/COLE/BOURNE

The Blythe/Cole/Bourne Catchment covers part of the West Midlands conurbation and a large part of the Birmingham Green Belt, south and east of the city. The Blythe and the Bourne are predominantly rural rivers and flow through attractive countryside, while the Cole, the major tributary of the Blythe, passes through built up areas in south Birmingham. The Blythe and the Cole rise in the south west corner of the Catchment and flow in a north easterly direction. The Bourne rises in the east and flows in a westerly direction. The Blythe and the Cole converge north of Coleshill and flow into the River Tame. The Bourne joins the Tame 0.4 Km downstream of the Blythe/Tame confluence.

The Catchment is home to approximately 520,000 people who depend on the water environment as an amenity, as habitat for wildlife and as a means of water supply and effluent disposal. With good communication links and an attractive environment close to a major urban centre, the urban fringe and green belt areas of the Catchment are under great pressure for development.

The NRA's vision for the Catchment is to:-

RIVER BLYTHE NORTH OF HAWKESWELL FARM



- Safeguard the high environmental quality of the Blythe, to seek to improve water quality across the Catchment and to protect river flows.
- Work in an integrated manner to meet the key objectives identified in the Plan.
- Ensure that demands on the water environment from both within and outside the Catchment are planned and managed in a balanced and sustainable way for the benefit of all users.

The key objectives of this plan are to:-

- Protect base flows in the River Blythe.
- Seek to minimise the adverse effects of new development by working with local planning authorities (LPA's).
- Promote the concept of sustainable development through 'source control' as a means of protection against flooding and to protect base flows in rivers.
- Protect sources of potable supply at Shustoke and Whitacre.
- Seek to improve water quality in the Catchment by addressing the issues of blue/green algae, sewage effluent discharge, wrong sewerage connections, pesticides and nitrates.
- Remove, as far as possible, obstructions to fish movement.
- Seek to improve water quality in the Blythe downstream of Brueton Park Pool.

The realisation of the NRA's vision will be achieved through a balanced management approach to all activities in collaboration with all users of the Catchment. It is our intention to work in partnership with all relevant agencies and representative organisations to promote and achieve an integrated approach to managing the Catchment. The plan will ensure required improvements can be carried out, and future demands catered for, in a sustainable manner.

2 INTRODUCTION

The rivers, lakes, estuaries and coastal waters of England and Wales have never before been subject to such large and rapidly increasing demands from the users of water. Many different uses interact or compete for water and will inevitably come into conflict with one another. The National Rivers Authority is the major regulator of the water environment in England and Wales and has the responsibility to reconcile conflicts between water users. Our Mission Statement expresses the following principles:

We will protect and improve the water environment by the effective management of water resources and by substantial reductions in pollution. We will aim to provide effective defence for people and property against flooding from rivers and the sea. In discharging our duties we will operate openly and balance the interests of all who benefit from the use of rivers, groundwaters, estuaries and coastal waters. We will be business like, efficient and caring towards our employees.

EARLSWOOD
LAKES



We have chosen to use Catchment Management Plans to translate these principles into action. Catchment Management Planning is a process that seeks to realise the potential of each catchment within existing political and economic constraints by establishing a sound planning base for the future management of the water system. The plans describe our vision for each catchment, identify problems and issues and propose actions that may be taken to resolve them. The plans also form a framework to promote consistent and appropriate responses to development proposals and to influence the drafting of local plans.

3 REVIEW OF THE CONSULTATION PROCESS

The Blythe/Cole/Bourne Consultation Report was launched on the 21 January 1994 at the St. John's Swallow Hotel, Solihull. Invitees represented a wide spectrum of interests from within the Catchment, plus national groups and organisations. The launch was attended by 74 representatives, who all received a copy of the report. Further copies of the report were circulated widely within and outside the Catchment to: industry, local authorities, environmental groups, sport and recreation groups and the public. A total of 600 consultation reports were produced, plus 1000 summary leaflets.

A seven week consultation period followed concluding on the 11 March 1994. Over this period two displays about the consultation report were exhibited in four libraries around the Catchment.

34 written responses were received, many supporting the objectives in the plan. Respondents included: major statutory bodies, county, district and parish councils, environmental groups and private companies. All responses were acknowledged; where appropriate some received follow up letters taking up issues raised. Respondents received a thank you letter following the consultation period.

The Authority welcomes the comments that have been received. Two additional issues have been proposed. The first (Issue 22) is a clarification of Issue 18, separating baseflows from the general issue of urban development. The second (Issue 23) is a review of flow gauging on the Blythe. This is to ensure that the Authority's information base is as accurate as possible and that future changes can be clearly identified. The general support shown for many of the objectives set out in the consultation document was appreciated.

Following the launch a number of meetings were held with parish councils, county councils, land agents, other statutory bodies and pressure groups to discuss issues arising from the report.

SAND AND GRAVEL
EXTRACTION



4 OVERVIEW OF THE CATCHMENT

4.1 Brief Description of the Catchment

The Catchment lies in the heart of lowland England, and includes parts of Birmingham and Solihull as well as a large rural hinterland south and east of the city. The surface area of the Catchment is approximately 380 Km² of which about 70% is rural. Urban development affects the Cole and to a lesser extent the Blythe. The Catchment incorporates 3 river subcatchments, the Blythe, the Cole and the Bourne, the Cole being a major tributary of the Blythe and joins 0.5 Km before its confluence with the Tame.

The Blythe and Cole rise close to one another south west of Earlswood. The Blythe skirts the Birmingham conurbation, passes close to Solihull and is joined by the Cole north of Coleshill. Two canals cross the Catchment, the Stratford upon Avon Canal and the Grand Union Canal. The headwaters of the Blythe feed the lakes at Earlswood which supply water to the canal system.

The Blythe is approximately 45 Km long and is the largest of the three rivers in the Catchment. It is designated as a Site of Special Scientific Interest (SSSI) along most of its length and is a fine example of a lowland river over clay. Most of the conservation and fisheries resources in the Catchment are concentrated on the Blythe. It provides both drinking water (with a public supply abstraction at Whitacre) and a means of disposal of treated sewage effluent.

From its rural beginnings, the Cole flows through Birmingham and is essentially an urban watercourse. It is 37 Km in length, the lower 14 Km from Cole Hall Lane runs first through a corridor of public open space then into open countryside before passing through Coleshill. Conservation and recreation interest is small, but the river is an important focus in landscape and amenity terms. Water is abstracted for cooling purposes but has a variable quality and is not used as a supply for drinking water or for sewage effluent disposal.

GAUGING WEIR ON
THE COLE AT
MOOREND AVENUE



The Bourne is the smallest of the three rivers. It drains a surface area of 47 Km² and flows east-west joining the River Tame 0.4 Km downstream of the Blythe/Tame confluence. Although it drains a predominantly rural area, conservation and fisheries interests are restricted. It provides drinking water, with a public supply abstraction at Shustoke, and there are a number of small sewage treatment works that discharge treated effluent into the river.

RIVER BOURNE
FROM FURNACE
END BRIDGE



The Catchment centres on Solihull but includes parts of Birmingham and North Warwickshire along with small parts of the administrative Districts of Stratford, Warwick and Bromsgrove.

The Catchment includes the green belt between Birmingham and Coventry and parts of the Forest of Arden. The countryside is attractive with rolling hills, small villages and areas of woodland. The main centres of population are in Birmingham and Solihull with 87% of the Catchment population living in the main urban areas which comprise 30% of the Catchment area. The M42, M6 and proposed Birmingham Northern Relief Road cross the Catchment along with the Birmingham to London rail link.

• 4.2 Summary of Catchment Uses and Activities

The Catchment is subject to strong development pressures for more housing, industry and major infrastructure projects. The completion of the M40 and the extension of the M42 together with the proximity of Birmingham Airport and the NEC have made the area a natural location for new development which has a regional as well as a local role. Pressure is particularly acute along the upper reaches of the Blythe between Earlswood and Dorridge.

BIRMINGHAM
INTERNATIONAL
AIRPORT



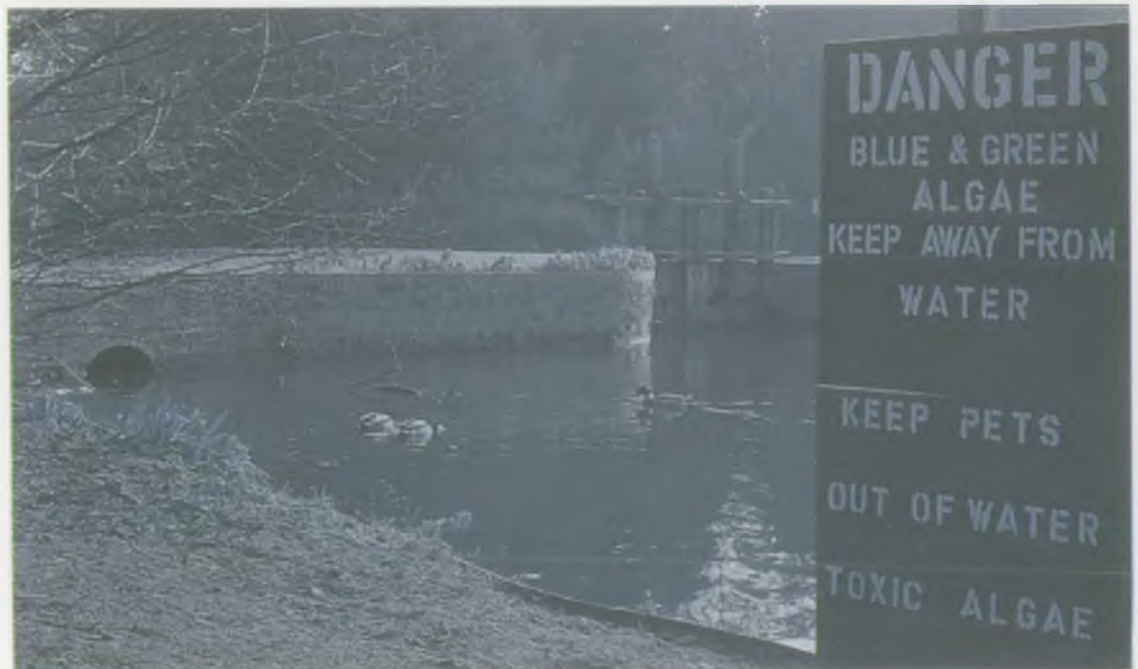
Approximately 6,000 dwellings are expected to be built within the catchment to the year 2001 representing approximately 200ha of land. This includes 750 dwellings in a new village at Dickens Heath and 100 houses at Earlswood. In addition, a 40ha business park is proposed in the Blythe valley close to the M42 and the A34. Urbanisation is affecting base and storm flows in the Blythe and the Cole. Low flows are now more common than they used to be, and there is greater fluctuation of flows within these rivers.

During prolonged dry weather almost the whole flow in the Blythe is abstracted for public water supply at Whitacre. Immediately downstream of the abstraction point the flow is supported by the entry of the Cole. The Blythe contains a significant artificial component in the form of treated sewage effluent from Barston Sewage Treatment Works (STW). The Headwaters of the Blythe are impounded by a series of reservoirs owned and managed by British Waterways. In theory cessation of flow from the main reservoir overflow could result in the river being dry.

There are 10 Severn Trent Water Ltd (STWL) sewage treatment works (STW) that discharge into the Blythe and five to the Bourne. The Company has no sewage works discharges to the Cole. The largest input into the Blythe is from Barston STW via the Eastcote Brook which is currently adversely affecting water quality in the river. The Blythe is designated a sensitive area liable to possible eutrophication along the stretch of river from Hampton in Arden to Whitacre under the EC Urban Waste Water Treatment Directive (91/271/EEC). Waters at risk of becoming eutrophic and receiving qualifying STW discharges (greater than 10,000 people or equivalent) are designated as sensitive. Treated effluent from Barston is equivalent to 80,000 people. The works will need phosphate removal to Directive standards by the end of 1998 unless it can be demonstrated that such removal will have no effect on the level of eutrophication. Wrong sewerage connections have caused pollution incidents in the Cran Brook and Purnells Brook. On the Cole there are problems with wrong sewer connections and until recently, de-icer from Birmingham Airport has affected the Low Brook. The most significant discharges to the Bourne are from Whitacre water treatment works and Daw Mill Colliery.

Landfill and the tipping of solid waste has had little adverse impact on the Catchment. The largest landfill is at Little Packington, and although it lies close to the Blythe, monitoring has revealed few problems with the site.

PROBLEMS OF
BLUE/GREEN ALGAE AT
BRUETON PARK POOL



The Blythe is an excellent coarse fishery for much of its length but the middle reaches are managed exclusively for trout. Angling is a major attraction. The Bourne and the Cole support only sparse coarse fish populations insufficient to encourage serious angling. There are obstructions on both the Blythe and the Cole, to the upstream movement of fish.

The Blythe has a wide range of natural structural features which combine with a high diversity of substrate to create a classic lowland river. Such diversity has helped make the Blythe botanically one of the most species rich rivers in lowland England. This in turn supports a rich invertebrate community whose survival depends on existing water quality and flow patterns being maintained. Water quality is being affected by some treated sewage discharges and by Brueton Park Pool where a large wildfowl population is causing serious eutrophication. Flow patterns are being affected by increased urbanisation.

SURFACE WATER
DISCHARGE AT BABB'S
MILL INTO THE COLE



The Cole for much of its length is limited in its conservation interest, but the river corridor forms a very important green wedge into the conurbation. The Bourne is a rural river following a natural course and has diverse physiographic features but its conservation resources are small.

The rivers and lakes in the Catchment are used for recreational purposes including bathing, canoeing, windsurfing, sailing and waterskiing (angling being the major recreational activity on the Blythe). Public access to the river banks of the Blythe is generally poor, however the Cole upstream of the M6 flows almost entirely through public open space. There are footpaths along the Bourne and sailing on Shustoke Reservoir.

The floodplains remain largely intact across the Catchment but with some localised encroachment along the Cole and Blythe. The potential for flooding from the Blythe has been identified at Cheswick Green where further investigations are underway. On the Bourne, problems of flooding at Arley have been experienced and an investigation has revealed the need for remedial works to the watercourse.

Water quality is an important factor as both the Bourne and the Blythe are abstracted for public water supply. The Blythe and the Bourne have a River Quality Objectives (RQO) of Class 1B (see Key Details). The Blythe is currently Class 2 for a number of reasons, many of which have been highlighted above. The Cole has a RQO of 1B in its upper reaches and a RQO of 2 for the remainder. It is currently Class 2 for all its length. 84% of the Blythe and 28% of the Cole fail to achieve their RQO's. Actions are proposed to improve water quality across the Catchment.

Catchment Key Details

Catchment Details	Area	380 km ²	
	Population	Existing (1991)	Predicted (2001)
		519,138	539,638
Topography	Ground levels	Minimum level, 70m Above Ordnance Datum (AOD). Maximum level 160m AOD.	
Administrative Details	County Councils	Hereford and Worcester County Council Warwickshire County Council	
	Unitary Authorities	Birmingham City Council Solihull Metropolitan Borough Council	
	District Councils	North Warwickshire Borough Council Warwick District Council Bromsgrove District Council Stratford upon Avon District Council	
	NRA	Severn-Trent Region, Upper Trent Area	
	Water Companies	Severn-Trent Water Ltd Sewage Treatment Works (15)	
	British Waterways	Grand Union Canal Stratford upon Avon Canal	
Water Quality	Length of river in National Water Council Class, comparing present quality with River Quality Objective (RQO).		
		Present Quality (km)	RQO (km)
	Class 1A (Very Good)	None	None
	Class 1B (Good)	18.8	69.9
	Class 2 (Fair)	114.9	66.3
	Class 3 (Poor)	2.5	None
	Class 4 (Bad)	None	None
Water Resources	Availability:	Surface water from the Blythe Cole and Bourne subject to prescribed flows. Groundwater - limited supplies.	
Flood Protection		Length of Main River in Catchment 69.3 km.	
Fisheries	Length of watercourse designated under EC Directive Freshwater Fisheries (78/659 EEC).		
	Salmonid	None.	
	Cyprinid	River	40.6 km.
		Canal	9.1 km.
Conservation	SSSI	11 - including 38 km of the Blythe.	
	SINC	211	

5 ACTION PLANS

Implementation of the plan is based around the 23 key issues set out below. These have been modified in the light of the consultation responses and their resolution is considered necessary in order that the plan can be successful in achieving real improvements within the Catchment.

The issues are presented with a number of actions, a target timetable, and the identification of responsible parties. Where possible costs have been estimated for the period covered by the plan.

Key

- > Greater than.
- < Less than.
- U Unknown at this time

Notes to Accompany "U" Costs

- Note i *Costs of improved control will be identified during negotiation of an operating agreement.*
- Note ii *Costs of environmental improvements by the statutory water undertakers are subject to negotiation and agreement by OFWAT as part of the periodic review of asset management plans.*
- Note iii *Individual costs will be identified and agreed during negotiations.*
- Note iv *(Capital) costs will be identified during investigations or surveys.*
- Note v *No additional cost.*
- Note vi *Cost will be divided between individual houses or businesses.*
- Note vii *Marginal increase in costs on all promoting bodies.*
- (*) *NRA costs identified here. Other bodies costs not known.*

A number of actions will require feasibility studies and appraisal of options prior to work commencing. In some cases, depending on the outcome of these studies and investigations, further action may not be required.

Notes on Abbreviations

BIA	=	<i>Birmingham International Airport</i>
BW	=	<i>British Waterways</i>
CC	=	<i>County Council</i>
DC	=	<i>District Council</i>
LPA	=	<i>Local Planning Authorities</i>
MAFF	=	<i>Ministry of Agriculture, Fisheries and Food</i>
NFU	=	<i>National Farmers Union</i>
Solihull	=	<i>Solihull Metropolitan Borough Council</i>
STW Ltd	=	<i>Severn Trent Water Limited</i>
Warks CC	=	<i>Warwickshire County Council</i>

No.	ISSUE	ACTIONS	RESPONSIBILITY		TOTAL COST (£K)	1994/95	1995/96	1996/97	1997/98	1998/99	FUTURE
			LEAD	OTHER							
1	To seek to improve the quality of the Blythe to meet its RQO from Earlswood Lakes to its confluence with the Cole	a) More detailed monitoring of water quality in the Blythe	NRA		<5						
		b) Investigations of methods to control blue/green algae in association with BW	BW	NRA	<5 (NRA)						
		c) Negotiate with BW to achieve an operating agreement for Earlswood Lakes	NRA	BW	U (i)						
2	To seek to improve the water quality of the Blythe from Eastcote Brook to its confluence with the Cole	a) Review consent at Barston STW to achieve objective.	NRA		(No cost)						2005
		b) Monitor to assess the improvement in water quality	NRA		<20						2005
		c) Negotiate with STW Ltd on any required operational changes to meet objectives and to comply with the requirements of the Urban Waste Treatment Directive (91/271/EEC).	NRA	STW Ltd	U (ii)						2005
3	To seek to ensure that pesticide levels in the Blythe do not compromise the EC Drinking Water Directive	a) Identify, investigate and eliminate illegal sources of inputs	NRA		150						
		b) Negotiate with landowners and dischargers to reduce pesticides by changing work practices	NRA	MAFF/NFU/CC	U (iii)						1999
		c) To determine the extent of bioconcentration of pesticides in the tissues of salmonid and coarse fish.	NRA		60 (N)						
4	To eliminate polluting discharges from surface water sewers to the Cran Brook resulting from wrong sewerage connections	a) Continuing investigations of wrong surface water sewerage connections and reconnections	STW Ltd	Property Owners	U (vi)						
		b) Generate increased public awareness	STW Ltd	NRA	U (vii)						1999

N – Subject to the availability of finance.

No.	ISSUE	ACTIONS	RESPONSIBILITY		TOTAL COST (£K)	1994/95	1995/96	1996/97	1997/98	1998/99	FUTURE
			LEAD	OTHER							
5	Seek to quantify the effect the proliferation of Surface Water balancing systems in Solihull which could lead to possible enhancement of flood levels on the Blythe	a) Undertake a river mathematical modelling exercise to determine flood levels at various points in the subcatchment	NRA		25	1	24				
		b) Resulting from the modelling exercise undertake flood prevention work	NRA		U (iv)						
6	Potential flooding from the Blythe of a housing development at Cheswick Green	a) Appraise the need for a flood protection scheme.	NRA		0.5						
		b) Consider undertaking any identified work.			U (iv)						
7/8	To ensure that river flows are maintained in the Blythe	Discuss water resource management of Earlswood Lakes and the Cuttle Brook with BW	NRA	BW	U (i)						
9/10	To seek to improve the water quality of the Blythe below Brueton Park Pool and to remove an obstruction to the upstream movement of fish.	a) Confirm the extent of pollution by wildfowl.	NRA		<5						
		b) Diversion of river around Brueton Park Pool.	NRA	Solihull	30 (NRA)	30					
11	Investigate the restoration of Blythe Mill Weir	a) Undertake structural survey of private weir	NRA		2	2					
		b) Consider feasibility of restoration	NRA	Owner	U (iv)						
12	To seek to improve the water quality of the Cole at Trittiford Mill and Hay Barn Recreation Ground	a) Investigate and divert wrongly connected sewerage	STW Ltd	Householders	U (vi)						1999
		b) Generate increased public awareness	District Councils		U (vii)						1999
13	To seek to ensure that watercourses adjacent to Birmingham Airport are not polluted by de-icer chemicals	a) Monitor watercourses to assess impact of 1st flush sewer diversion system	NRA	BIA	<10 (*)						
		b) Use NRA powers to identify further improvements as necessary	NRA		<10						

(if necessary)

No.	ISSUE	ACTIONS	RESPONSIBILITY		TOTAL COST (£K)	1994/95	1995/96	1996/97	1997/98	1998/99	FUTURE
			LEAD	OTHER							
14	To seek to prevent possible future flooding of Station Road Industrial Estate, from the river Cole at Coleshill	a) Mathematical modelling exercise undertaken in 1993/4	NRA		25						
		b) A capital flood defence scheme has been approved subject to feasibility and prioritisation in the Capital Works Programme.	NRA		590	20	20	550			
		c) The flood defence warning system was extended in the spring of 1994 to cover Station Road.	NRA	Warks. C.C	0.5 (*)						
15	To allow upstream movement of fish along the Cole above weirs at Cooks Lane and Moorend Avenue	a) Determine the possibility of a fish chute to allow passage upstream at Crooks Lane	NRA		U (iv)						
		b) Investigate the possibility of modifying the gauging weir	NRA		0.5	May					
		c) Construction of fish chute at Cooks Lane	NRA		15						
16	To seek to improve the fishery in the Bourne	Carry out an extensive investigation to determine the underlying causes of poor fishery status.	NRA		10	5	5				
17	Seek to reduce Nitrate levels in the Bourne to meet EC Drinking Water Directive	Drinking water currently complies with EC Directives following modified procedures at Whitacre water treatment works. To assist in future compliance, the Authority will continue to encourage farmers and landowners to comply with the "Code of Good Agricultural Practice for the Protection of Water".									
17	Seek to minimise the impact of urban development on all aspects of the water environment. Encourage appropriate measures through our role as a statutory consultee in development plans and planning applications	Direct influences in the planning process by seeking the adoption of NRA policies and proposals in Development Plans	NRA	LPA's/ Developers	U (v)						Ongoing

No.	ISSUE	ACTIONS	RESPONSIBILITY		TOTAL COST (£K)	1994/95	1995/96	1996/97	1997/98	1998/99	FUTURE
19	Periodic discharge of high levels of inorganic solids into the Blythe from Horn Brook	Investigation into origin and cause of solids discharge. Determine effect of deposition on quality of gravel beds and consequences for spawning salmonids.	NRA		10						
20	To establish the reason for the poor biological quality of the Temple Balsall Brook	a) Investigate the poor biological quality	NRA		<5						
		b) Take remedial action as necessary	NRA		Unknown						
21	To seek to alleviate existing flooding from the Bourne at Old Arley (non main river watercourse at this point)	a) River channel survey has been carried out and limited channel capacity has been identified.	NRA		<.5						
		b) Negotiate with Local Authorities, and Landowners to secure remedial channel works as necessary	NRA	DC/CC and Riparian Owners	U (iv)						
22	To seek to address the reduction of baseflows in the Blythe due to increased urbanisation	a) Promote development which sustains natural recharge to groundwater	NRA	LPA	U (v)						Ongoing
		b) To encourage LPA's not to release Green Belt land and to support restraint policies in urban fringe areas.	NRA	LPA	U (v)						
23	To ensure accurate gauging of flows on the Blythe	a) Review existing gauging stations and assess the need for new stations	NRA		<5						
		b) Resulting from the review modify or install new gauging stations and/or equipment	NRA		U (iv)						

6 FUTURE REVIEW AND MONITORING PROGRAMME

The NRA will be jointly responsible, with other identified organisations and individuals, for implementing this Final Plan. Progress will be monitored and normally reported annually. These reviews will examine the need to update the CMP in the light of changes in the Catchment. The period between major revisions will normally be five years.

The plan uses River Quality Objectives. A new system for the assessment of water quality is being introduced and this will be used when the Plan is revised.

The annual review will take the form of a short progress report to include work achieved compared with that planned and to highlight any changes to the Plan.

The annual review will be sent to all those who responded to our consultation.

APPENDICES

APPENDIX 1 – River Quality Objectives

River Class	Quality Criteria	Remarks	Current Potential Uses
1A	<p>Class limiting criteria (95 percentile)</p> <ul style="list-style-type: none"> i) Dissolved Oxygen saturation greater than 80% ii) Biochemical Oxygen Demand not greater than 3mg/l iii) Ammonia not greater than 0.4mg/l iv) Where the water is abstracted for drinking water, it complies with requirements for A2** water v) Non toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available). 	<ul style="list-style-type: none"> i) Average BOD probably not greater than 1.5mg/l ii) Visible evidence of pollution should be absent 	<ul style="list-style-type: none"> i) Water of high quality suitable for potable supply abstractions and for all other abstractions. ii) Game or other high class fisheries. iii) High amenity value.
1B	<ul style="list-style-type: none"> i) DO greater than 60% saturation ii) BOD not greater than 5mg/l iii) Ammonia not greater than 0.9mg/l iv) Where the water is abstracted for drinking water, it complies with requirements for A2** water v) Non toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available). 	<ul style="list-style-type: none"> i) Average BOD probably not greater than 2mg/l ii) Average ammonia probably not greater than 0.5mg/l iii) Visible evidence of pollution should be absent iv) Waters of high quality which cannot be placed in Class 1A because of high proportion of high quality effluent present or because of the effect of physical factors such as canalisation, low gradient or eutrophication v) Class 1A and Class 1B together are essentially the Class 1 of the River Pollution Survey (RPS). 	<p>Water of less high quality than Class 1A but usable for substantially the same purpose.</p>
2	<ul style="list-style-type: none"> i) DO greater than 40% saturation ii) BOD not greater than 9mg/l iii) Where water is abstracted for drinking water, it complies with requirements for A3** water iv) Non toxic to fish in EIFAC terms (or best estimates if EIFAC figures not available). 	<ul style="list-style-type: none"> i) Average BOD probably not greater than 5mg/l ii) Similar to Class 2 of RPS iii) Water not showing physical signs of pollution other than humic colouration and a little foaming below weirs 	<ul style="list-style-type: none"> i) Water suitable for potable supply after advanced treatment ii) Supporting reasonably good coarse fisheries iii) Moderate amenity value
3	<ul style="list-style-type: none"> i) DO greater than 10% saturation ii) Not likely to be anaerobic iii) BOD not greater than 17mg/l* 	<p>Similar to Class 3 of RPS</p>	<p>Waters which are polluted to an extent that fish are absent or only sporadically present. May be used for low grade industrial abstraction purposes. Considerable potential for further use if cleaned up</p>
4	<p>Waters which are inferior to Class 3 in terms of dissolved oxygen and likely to be anaerobic at times</p>	<p>Similar to Class 4 of RPS</p>	<p>Waters which are grossly polluted and are likely to cause nuisance</p>
X	<p>DO greater than 10% saturation</p>		<p>Insignificant watercourses and ditches not usable, where objective is simply to prevent nuisance developing.</p>

Notes

a) Under extreme weather conditions (eg flood, drought, freeze up), or when dominated by plant growth, or by aquatic plant decay, rivers usually in Classes 1, 2 and 3 may have BOD and dissolved oxygen levels, or ammonia content outside the standard levels, for those Classes. When this occurs the cause should be stated along with analytical results.

b) The BOD determinations refer to 5 day carbonaceous BOD (ATU). Ammonia figures are expressed as NH_4 .

* This may not apply if there is a high degree of reaeration.

** EEC category A2 and A3 requirements are those specified in the EEC Council Directive of 16 June 1975 concerning the Quality of Surface Water intended for Abstraction of Drinking Water in the Member States.

c) In most instances the chemical classification given above will be suitable. However the basis of the classification is restricted to a finite number of chemical determinands and there may be a few cases where the presence of chemical substance other than those used in the classification markedly reduces the quality of the water. In such cases, the quality classification of the water should be downgraded on the basis of the biota actually present, and the reasons stated.

d) EIFAC (European Inland Fisheries Advisory Commission) limits should be expressed as 95% percentile limits.

APPENDIX 2 – Water Quality Targets

Water quality is assessed against a number of control measures:

- i) Compliance with River Quality Objectives (RQO) based on the National Water Council (NWC) target classes.
- ii) Biological target classes.
- iii) Compliance with relevant EC Directives.
- iv) Compliance with Proposed Statutory Water Quality Objectives (SWQO).

River Quality Objectives are based upon water quality requirements for different river uses. The standards relating to the most sensitive use in a given stretch apply.

The NRA currently reports on the quality of rivers, canals and estuaries to the Department of the Environment on the basis of the National Water Council target classes. These are based upon a limited range of chemical criteria, eg BOD, dissolved oxygen and ammonia. Rivers and canals are ranked in order of decreasing water quality as 1A (very good), 1B (good), 2 (fair), 3 (poor) and 4 (bad).

Biological assessment of the presence and abundance of aquatic invertebrates, in conjunction with sampling and analysis for some chemical parameters, provides a comprehensive indication of water quality.

As well as the RQO classification, European Commission (EC) Directives are also used to set quality targets for both ground and surface water.

- a) the 78/659/EEC Fisheries Directive defines standards necessary to ensure that water quality is suitable for supporting fish populations.
- b) the 76/464/EEC Dangerous Substances Directive deals with the discharge of substances considered harmful to the aquatic environment.

N.B. The Fisheries Directive applies only to designated stretches, whereas the Dangerous Substances Directive applies to all waters.

- c) the Surface Water Abstraction Directive (75/440/EEC) must also be considered when setting consent conditions in the catchment, as the Blythe and Bourne are both heavily abstracted for drinking water.
- d) the Nitrate Directive deals with the problem of nitrate pollution in surface and groundwaters for any designated areas.
- e) the Urban Waste Water Directive does apply to the catchment with a stretch of the Blythe from Hampton in Arden to Whitacre.

(When a stretch is classified under an EC Directive additional Environmental Quality Standards apply).

APPENDIX 3 Glossary

Algae	Microscopic (sometimes larger) plants. Algae occur in water and are often discussed in the context of eutrophication.
Ammonia	A chemical compound found in water often as a result of pollution by sewage effluents. It is widely used to determine water quality. Ammonia detrimentally affects fish.
Anaerobic	Living without oxygen.
Base Flow	The flow in a river derived from groundwater sources.
BOD	Biochemical Oxygen Demand. A measure of the amount of oxygen consumed in water (over 5 days), usually by organic pollution. Oxygen is vital for life so the measurement of the BOD tests whether pollution could affect aquatic animals.
Cyprinid Fish	Coarse fish belonging to the carp family, like roach, dace and bream.
DO	Dissolved Oxygen. The amount of oxygen dissolved in water. Oxygen is vital for life so this measurement is a test of the health of a river.
EC Directive	A type of legislation issued by the European Community which is binding on Member States in terms of the results to be achieved but which leaves to Member States the choice of methods.
Eutrophication	The process of nutrient enrichment of waters. This enrichment can cause unsightly growths of algae and other biological changes in the water environment
Floodplain	Land adjacent to a watercourse that is subject to flooding.
Main River	The watercourses shown on the statutory 'Main River maps' held by NRA and MAFF. The NRA has permissive powers to carry out works of maintenance and improvement on these rivers.
95 Percentile	A level of water quality, usually a concentration which is not exceeded for 95% of the time.
Physiographic	Pertaining to the physical structure of the river and surrounding land.
River Quality Objective	The statement of the category of water quality that a body of water should match, usually in order to be satisfactory for use as a fishery or water supply etc.
Salmonid Fish	Game fish of the Salmon Family, eg trout and salmon.
SINC	Site of Importance for Nature Conservation. Also known as Prime Sites, Key Sites, Special Wildlife Sites. Designated by County Conservation/Wildlife Trusts and in some cases English Nature and Local Authorities. Nonstatutory.
Source Control	The collective term to describe the management of run off at or near the point of impact of rainfall, before it reaches the traditional piped drainage and sewer systems of urban areas.
SSSI	Sites of Special Scientific Interest. Designated by English Nature or the Countryside Council for Wales for their nature conservation & physiographic interest of at least regional importance or their earth science interest of at least national importance. Statutory set up under National Parks and National Heritage or advice from English Heritage or by the Access to the Countryside Act 1949 and Wildlife and Countryside Act 1981.
STW	Sewage Treatment Works.
Statutory Water Quality Objective (SWQO)	A quality objective given a statutory basis by regulations made under the Water Resources Act 1991.



NRA

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