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NRA

*National Rivers Authority
Thames Region*

**RIVER MISBOURNE
ALLEVIATION OF LOW FLOWS
— PROGRESS REPORT —**



NRA Thames 181



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The National Rivers Authority (NRA) has the duty to conserve, redistribute, augment and secure the proper use of water resources in England and Wales, whilst at the same time conserving and enhancing the environment. The key aim is to manage water resources to achieve a balance between the needs of the environment and those of abstractors.

BACKGROUND

The River Misbourne rises in the Chiltern Hills in Buckinghamshire and passes through Great Missenden, Amersham, Chalfont St Giles and Chalfont St Peter before joining the River Colne at Denham.

During times of drought the river has always tended to lose water from its upper reaches and to cease flowing in its middle section. This natural variation in flow has been exaggerated by two factors:

1. About 65% of the water available to the river in an average year is abstracted for public supply.
2. The resulting effluent is discharged into the river system outside the catchment area (except for a small amount discharged at Gerrards Cross at the downstream end) and is therefore lost to the Misbourne.

The reduction in flow has had an adverse effect on the ecology of the river and its amenity value. Wildlife habitats have been lost, silting has increased and fish numbers have been reduced, in places to extinction. The view of the river is marred in many places by feeble flow or a dry bed. In fact, the River Misbourne is believed to be one of the rivers worst affected by abstraction in the whole of England and Wales.

FINDING A SOLUTION

In 1986, consulting engineers were commissioned to investigate the causes of the Misbourne's low-flow problems and suggest solutions. They completed their work in 1989 and suggested a range of alternative options for remedying the problem. These were assessed by the newly-formed NRA in terms of environmental benefit, cost and engineering feasibility. The economic value of the environmental benefits resulting from the alleviation of low flow in the river were assessed. The NRA also held detailed discussions with the main abstractors, Three Valleys Water and Thames Water. These discussions led to the identification of an option that had only been partly examined within the work of the consultant. Further appraisal of this new option resulted in it being identified as the preferred option.

Late in 1993 an opportunity arose to move the financing of low flow alleviation schemes from the NRA to the Water Companies involved. But before this could happen, approvals were required from the Department of the Environment (DoE) and the Office of Water Services (OFWAT). The new preferred option for the Misbourne was, therefore, submitted as the recommended scheme to DoE and OFWAT in March 1994 along with schemes for several other rivers. Approval was announced in July 1994 when it was agreed that Thames Water and Three Valleys Water could recover the costs of the scheme through their future charges.

This represented a major step forward in the future progress of the scheme. With continued co-operation from the Water Companies it is hoped that the major part of an alleviation scheme will be in place by 1998.

THE RECOMMENDED SCHEME

Under the recommended scheme, there will be a substantial reduction in abstraction, mainly in the upper catchment. Three Valleys Water will obtain replacement water from existing sources in the Colne Valley; Thames Water will obtain alternative supplies from an existing source in the Thames valley.

Given sufficient rainfall the reductions in abstraction will allow the groundwater levels to recover. As a result, the river flow will be replenished by natural and reliable means - from springs and from groundwater seepage.

There will be significant environmental benefits. Wildlife habitats in the river channel will be restored. So will those habitats in the valley bottom which are dependent on a high water level. There will also be improvements to general amenity resulting from a river with stronger and more persistent flows.

The scheme will be implemented in two phases.

Phase 1

Three Valleys Water will reduce abstraction from pumping stations at Great Missenden and Amersham by a total of 8 ML/d (million litres a day). This overall reduction will be achieved by modifying existing pumping and pipeline facilities so that additional supplies can be taken from existing sources near the River Colne.

Thames Water will reduce abstraction by a total of 7 ML/d from pumping stations at Hampden Bottom and Wendover Dean. Alternative Supplies will come from an existing groundwater source at Medmenham near the River Thames. Modifications to pumping and pipeline facilities will again be required.

It is planned that Phase 1 will be completed in 1998. Groundwater levels should then re-establish allowing flows to be restored upstream of Amersham. Downstream of Amersham flow should increase also but it is difficult to predict whether the increase will be adequate so time will be allowed for the benefits to the river to be observed. If it becomes not satisfactory, then Phase 2 will be implemented.

Phase 2

This would require a combination of a further reduction in abstraction of 4 ML/d by Three Valleys Water at Amersham and Chalfont St Giles; the lining of certain reaches of the river bed; and small bankside boreholes to augment river flow. In particular flows through Chalfont St Giles and Chalfont St Peter could then be maintained in this way.

It is unlikely that work on Phase 2, if needed, would be commenced before 2000.



PRELIMINARY WORKS

While the examination of options was in progress the NRA embarked upon a programme of preliminary and investigative works which both assisted in the assessment of options and will be useful in monitoring the recovery of the river once an alleviation scheme is implemented. These works included:-

- *The construction of 15 groundwater observation boreholes in the river valley between Mobuell and Chalfont St Peter.*
- *The construction of exploratory abstraction boreholes near the confluence of the Misbourne with the River Colne.*
- *The construction of a river flow measurement station upstream of Shardeloes Lake.*
- *Investigations into the possible effects on the water table of a main sewer which runs approximately parallel to the river.*



River flow measurement station upstream of Shardeloes Lake.

MONITORING

A programme of hydrological and environmental monitoring will be put in place and funded by the NRA before the implementation of Phase 1. This monitoring will continue throughout the implementation of the alleviation scheme and for several years afterwards.



River Misbourne at Chalfont St. Giles

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