Introduction

The River Mimram is a tributary of the upper Lee which it joins near Hertford; other tributaries of the Lee include the Beane, Rib and Ash. The Mimram is a chalk stream with a varying amount of glacial drift underlying the river bed and exhibits winterbourne behaviour in its upper reaches. It is characterised by a significant level of public abstraction of groundwater and minimal return of treated effluent to the watercourse. This is because most effluent sewage generated is piped downstream to a sewage treatment works outside the Mimram catchment before being returned to the Lee. There is therefore an overall net loss to the catchment as a result of water use; this has obvious implications for the functioning and sustainability of the river ecosystem.

Focus

- To identify which reaches on the River Mimram have been depleted by groundwater abstraction and determine the extent to which increases in river flow would be desirable, through a wide ranging review and analysis of hydrological, environmental, planning and historical/anecdotal information (Part 1);
- To develop a robust and defensible computer based regional groundwater model of the catchments of the Upper Lee, Mimram, Beane and Rib to assist in carrying out Parts 1 and 2 by simulating the effects of existing and potential future groundwater abstraction scenarios and their effect on the river system; and
- To identify and evaluate a range of options for low flow alleviation on the River Mimram, including an outline assessment of cost, economic benefit and environmental impact, and carrying out all necessary consultation both internally within the Environment Agency and externally with relevant authorities and interest groups, and presentations at public meetings (Part 2).
**Components**
Within the focus of the project, a baseline assessment of the physical habitat and ecology of the River Mimram is being undertaken. This assessment comprises:

- continuous river habitat (RHS) and river corridor (RCS) survey;
- continuous fluvial geomorphological audit;
- collation and review of fisheries, mammal, bird, and macroinvertebrate records;
- appraisal of the requirements of riverside designated sites (e.g. SSSIs, LNRs, CWS) and local Biodiversity Action Plans; and
- impact assessment of low flow alleviation and associated habitat improvement measures.

**Justification**
The impacts and degradations being addressed by the study include: loss or decline of species (e.g. white clawed crayfish), loss or degradation of habitat (e.g. aquatic macrophyte beds), effects of historic river management (e.g. dredging, realignment, impoundment, regulation), effects on water quality (e.g. contribution of sewage effluent to flows), and effects on hydrology and geomorphology (e.g. deposition of fine sediment particles).

**Science / Objectivity**
The key site evaluations are described in the components section of this brief (previous page). The options selection and appraisal procedure for the low flow alleviation and associated habitat improvements will include an Environmental Impact Assessment. This will take into account a range of different flow scenarios predicted by the regional groundwater model.

**Audit**
A baseline assessment of the physical structure and ecology of the River Mimram has been undertaken (described in the components section of this brief). Post-project monitoring measures/appraisals have yet to be undertaken.

**Dissemination**
Consultation with the Environment Agency and relevant authorities and interest groups have been undertaken, one newsletter has already been produced and two further newsletters will be produced during the course of the project, and the findings will be presented at a series of public meetings.
A full report will be produced as a record of the project.

**Priority Need**
Information on low flow alleviation technologies and techniques applicable to chalk streams.

**About Entec**
Entec is one the leading multidisciplinary environmental and engineering consultancies. Entec’s riverine and floodplain expertise includes: full EIA capability; river and floodplain habitat creation, restoration and enhancement; hydrological, water quantity and quality modelling; fluvial geomorphology; landscape planning; river basin management; flood risk assessments; surveys and management strategies for aquatic fauna and flora; fisheries management; RHS; PHABSIM; GIS and the implications of climate change.