

# Environmental Protection Report

**EAST DEVON PUBLIC WATER SUPPLY STRATEGY**

**PRELIMINARY ASSESSMENT OF EPILITHIC ALGAE  
SUMMER AND AUTUMN 1992 – LOWER  
RIVER AXE AND BRUCKLAND STREAM**

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REVIEW OF SOUTH WEST WATER'S PRELIMINARY ASSESSMENT OF THE EPILITHIC ALGAE  
OF THE LOWER AXE AND BRUCKLAND STREAM

Introduction

Diatoms are algae, microscopic unicellular plants, which range in size from approximately 5 $\mu$ m to 500 $\mu$ m and live wherever there is moisture. The diatom community composition depends mainly upon the chemical characteristics of the water and not on the size and physical features of the rivers. The diatoms show a wide range of sensitivity to pollution and respond rapidly to changes in water quality. These features make diatoms excellent indicators of water quality.

Sampling techniques can lead to a wide variation in the diatom community observed. Therefore the adoption of a standard sampling method is required, in order to reduce any variation in the species observed; which would be due to variation in habitat, rather than water quality. The best habitat to sample is the true epilithon, i.e. the diatoms which are growing directly on stones, as this habitat can be found from the source to the estuary. Care must be taken to remove any silt or mucilage, as the species will be different to the epilithic species. Also, care must be taken not to select stones with Cladophora or other macrophytes, as the epiphytic diatoms (i.e. those that grow on other plants) will be different to the epilithic diatoms. If the same community is observed throughout the length of the river, the changes in the diatom community will then reflect changes in water quality.

Various water quality indices have been created that use diatoms. The Generic Diatom Index (GDI) Rumeau and Coste, 1988, has been used to monitor the rivers of the Artois-Picarde region of North East France. The basis of this index is the scoring of each diatom tax with a score of 1-20, with 1 being the most polluted and 20 the cleanest.

Results

GENERIC DIATOM INDEX

SITES	SUMMER	WINTER
	Bruckland Stream	
Reservoir site	12.9	11.3
Higher Bruckland Farm	12.0	11.7
Haye Farm	11.9	13.5
Lower Bruckland	13.4	12.3
	River Axe	
u/s Whitford Bridge	11.8	12.5
Whitford Bridge	11.4	12.5
Nunford Footbridge	9.5	12.7

Discussion

The diatom data indicates that all of the monitored sites are classified as either moderately (organically) polluted, or strongly eutrophic; except for Nunford Footbridge in the summer when it was strongly (organically) polluted.

However, I have several reservations about the data. The sampling method used would indicate that more than one habitat was sampled, rather than just the true epilithon. This may have caused confusion with the Cocconeis pediculus/placentula community. C. pediculus is an epiphyte of Cladophora whereas C. placentula is found in the epilithon. If only the epilithon had been sampled, a different community structure would have been observed which would have given a better indication of the water quality.

Another problem with the identification is that the Navicula taxa has not been identified to species level. This is required, as the GDI splits Navicula into three, each sub-group having a different score. In calculating the GDI, I scored all of the Navicula as belonging to the cleanest group. This may have resulted in a cleaner water quality score being awarded.

The presence of Cladophora in the Axe and Bruckland Stream would indicate that the water is eutrophic.

Stephen B Rosser  
3 December 1992

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LOWER RIVER AXE & BRUCKLAND STREAM  
 PRELIMINARY ASSESSMENT OF EPILITHIC ALGAE  
 SUMMER & AUTUMN, 1992

by J Watson

Sampling sites

The location of sampling points and dates of sampling are shown in Table 1.

Table 1

SITES	NGR	DATE SAMPLED	
		SUMMER	AUTUMN
F: Reservoir site, d/s track	SY 2890 9375	21-08	22-09
G: Higher Bruckland Farm	SY 2845 9340	14-08	22-09
H: Haye Farm	SY 2765 9290	14-08	22-09
I: Lower Bruckland	SY 2707 9295	13-08	23-09
B: u/s Whitford bridge	SY 2650 9560	24-08	01-10
C: Whitford bridge	SY 2625 9540	24-08	29-09
D: Nunford footbridge	SY 2615 9475	21-08	29-09

Sites F,G,H,I on the Bruckland Stream (from u/s to d/s)  
 Sites B,C,D on the River Axe (from u/s to d/s)