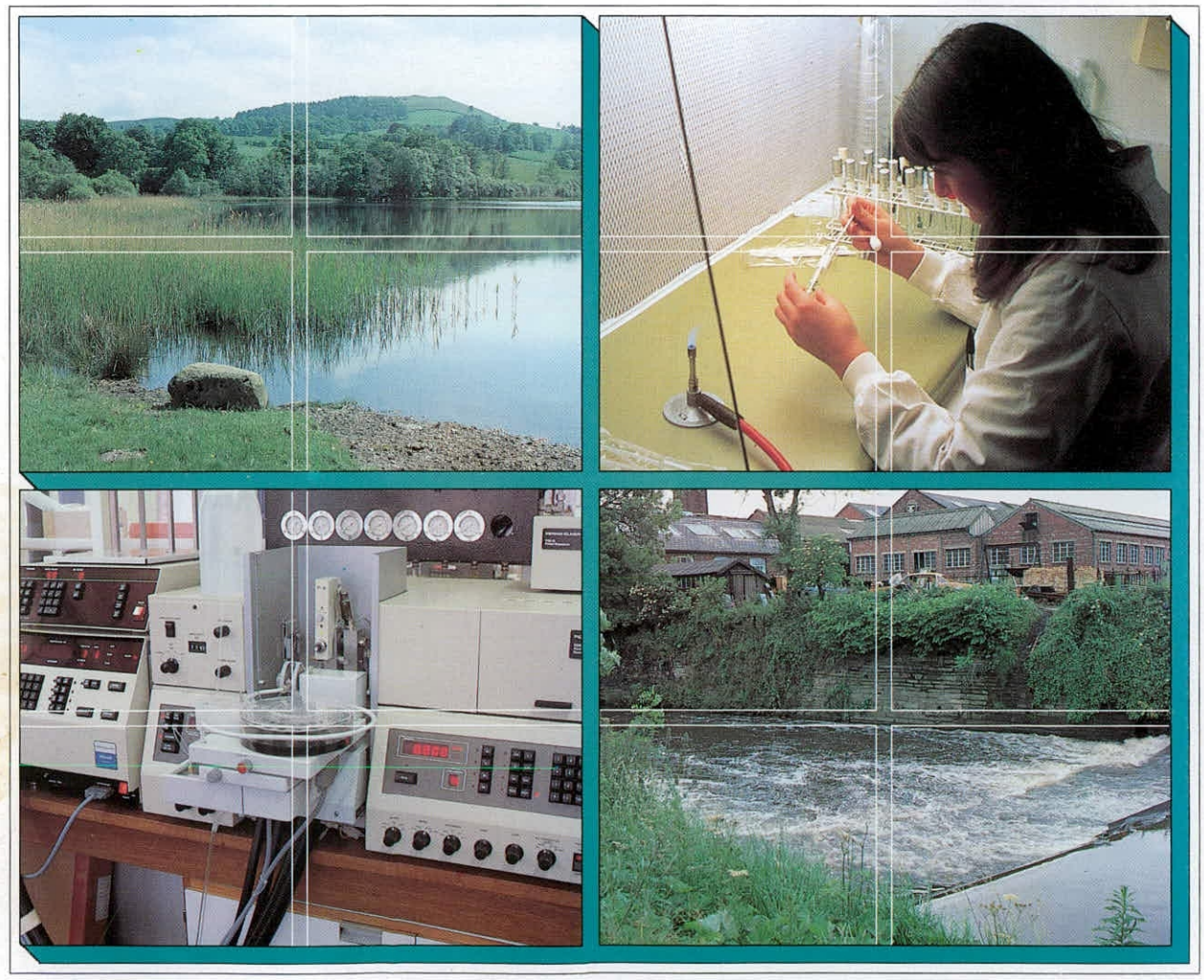
Institute of Freshwater Ecology

Rivers Ouse, Wharfe and Ure Macrophyte Surveys

M Gravelle BSc, MSc
P Scarlett BSc, MSc
D Smith BSc
F H Dawson PhD, CBiol

Report to: Yorkshire Water Services Ltd
Report Reference No: T04073G7/7



Natural Environment Research Council

Institute of Freshwater Ecology

River Laboratory
East Stoke, Wareham
Dorset BH20 6BB
United Kingdom

Telephone +44 (0)1929 462314
Facsimile +44 (0)1929 462180
Email

Rivers Ouse, Wharfe and Ure Macrophyte Surveys

M Gravelle BSc, MSc
P Scarlett BSc, MSc
D Smith BSc
F H Dawson PhD, CBiol

Project Leader:	F H Dawson
Report Date:	January 1998
Report to:	Yorkshire Water Services Ltd
Report Reference No:	T04073G7/7
Project No:	T04073G7

Centre for Ecology & Hydrology
Institute of Freshwater Ecology
Institute of Hydrology
Institute of Terrestrial Ecology
Institute of Virology & Environmental Microbiology

Natural Environment Research Council

INTELLECTUAL PROPERTY RIGHTS

CONFIDENTIALITY STATEMENT

'In accordance with our normal practice, this report is for the use only of the party to whom it is addressed, and no responsibility is accepted to any third party for the whole or any part of its contents. Neither the whole nor any part of this report or any reference thereto may be included in any published document, circular or statement, nor published or referred to in any way without our written approval of the form and context in which it may appear.'

Executive Summary.

1. Yorkshire Water Services Ltd have made applications for Drought Orders and Time Limited Licences because of the water resource deficit in the region, for which the Environment Agency required a series of macrophyte surveys. The first surveys were completed in August 1996 by Scott Wilson Resource Consultants (SWRC) and the Institute of Freshwater Ecology was contracted to undertake macrophyte surveys at a total of twenty five sites on three rivers (18 on the Wharfe, 5 on the Ure and 2 on the Ouse) during August 1997.

2. The macrophyte surveys were completed following the methodology detailed in Methods for the use of aquatic macrophytes for assessing water quality - 'Blue Book' (HMSO, 1987). Method B from the book was used, which provides a rapid system for assessing abundance of macrophytes in river habitats. A 500m (banklength) survey was completed at each site, recording macrophyte abundance on the 5 point scale (scale A).

3. In addition to the 500m survey a second survey was completed over 100m, located in the centre of the 500m reach. This recorded abundance on the 9 point scale (C scale) to provide finer detail for analysis. Sketch maps of each site were completed, together with photographs of the major plant stands.

4. A total of 56 macrophyte species were recorded from twenty five sites.

5. Prior to completing the analysis it was found that the 1996 report by Scott Wilson Resource Consultants contained a significant number of errors. Species noted on the survey forms had not been transferred to the summary table and some on the table were not found on the original survey forms. A thorough check of the 1996 data was carried out and it was found that every site had at least one error and the average was three errors per site. This affected the Average Score Per Taxon (ASPT) results presented and corrections were made for this report.

6. Fewer species were recorded in 1997 compared to 1996 (50-100%). Of these many were marginal species, associated with the edges of river habitats, growing near or just in the water. There were no clear trends in the presence or absence of aquatic macrophytes, with many species recorded at a site in one year but not in the other year.

7. Average Daily Flow data for one site on each of the three rivers were provided by Yorkshire Water for the period 1995-1997. Flow levels were generally lower in 1995 than in the corresponding period for 1996 or 1997. The largest differences were in autumn-winter flows which were significantly lower for the period 1995-96 compared to 1996-97.

8. ASPT and Mean Trophic Rank (MTR) scores were calculated for each site in each year and show similar trends for both years. These relate to trophic status and indicate rivers with relatively low nutrient levels in the upper reaches with a gradual increase in nutrient concentrations downstream. Although these systems

were not developed to measure flow impacts it would be expected that any major impacts on the plant populations through reduced flows would be reflected in differences in ASPT or MTR score between the years. No consistent trend of changes attributable to flow changes were found.

9. Aquatic plant populations are variable, often over relatively short time periods, and distinguishing changes due to drought from natural cycles requires either dramatic changes or a long time series of data. Our analysis does not indicate any impact attributable to changes in flow, with the possible exception of the reduction in number of marginal species recorded in 1997. Lower flows in the winter of 1995-96 would have prevented many marginal plants being washed away for the 1996 survey. These may have been subsequently lost during the winter of 1996-97. There are no consistent trends in the aquatic plant populations which suggest that any impacts were probably relatively minor.

10. It is recommended that further surveys are carried out at each site for at least one more year to establish the degree of natural variation.

Contents.

List of Tables.

List of Figures.

1. Introduction.

1.1 Background to report.

Yorkshire Water Services Ltd have made applications for Drought Orders and Time Limited Licences because of the water resource deficit in the region. These applications apply to the rivers Wharfe, Ure and Ouse, for which the Environment Agency required a series of macrophyte surveys.

The first surveys were completed in August 1996 by Scott Wilson Resource Consultants (SWRC) and this project undertook repeat surveys at most of the sites in order to assess any changes in the macrophyte populations of the rivers.

1.2 Objectives of the project.

The Institute of Freshwater Ecology was contracted to undertake macrophyte surveys at a total of twenty five sites on three rivers (18 on the Wharfe, 5 on the Ure and 2 on the Ouse) during August 1997.

The majority of these surveys were repeats of work in 1996 by SWRC at sites located by grid reference and sketch maps provided by Yorkshire Water Services Ltd. Additional surveys were requested for two sites on the Ouse and some alternative sites on the Ure.

The objectives of the second surveys were to allow an assessment of changes in macrophyte populations compared to the baseline of 1996.

2. Methodology.

Twenty five sites on the rivers Wharfe (18), Ure (5) and Ouse (2) were surveyed during August 1997 (Table 1). At each site two macrophyte surveys were completed, together with a sketch map and photographic record.

Table 1. List of sites surveyed during August 1997 by the IFE.

Site	Number	NGR
Wharfe		
u/s Starbotton	1	SD 946756
d/s Conistone Bridge	2	SD 980672
u/s Hebden	3	SE 015626
Appletreewick	4	SE 042602
Dibb u/s Dibbles Bridge	5	SE 054637
d/s Strid	6	SE 080551
u/s Lobwood	7	SE 072523
Addingham (d/s weir)	8	SE 091489
Ilkley	9	SE 124484
d/s Burley	10	SE 175463
Knotford	11	SE 223463
u/s Riffa Beck	12	SE 255456
The Nunnery	13	SE 288455
u/s Collingham	14	SE 354457
Boston Spa	16	SE 423465
u/s Woodhall Hotel	15	SE 369467
u/s Newton Kyme	17	SE 455457
u/s Tadcaster Weir	18	SE 485439
Ure		
Ulshaw	1b	SE 145872
Jervaulx	2	SE 164861
d/s Kilgram Bridge intake	2b	SE 191860
Clifton Castle	3	SE 222831
Aldwark	9	SE 468629
Ouse		
at Beningbrough Hall (u/s Moor monkton intake)	2	SE 521581
d/s Moor Monkton intake	1	SE 536570

2.1 Macrophyte surveys.

The macrophyte surveys were completed following the methodology detailed in Methods for the use of aquatic macrophytes for assessing water quality - 'Blue Book' (HMSO, 1987). Method B from the book was used, which provides a rapid system for assessing abundance of macrophytes in river habitats.

A 500m (banklength) survey was completed at each site, recording macrophyte abundance on the 5 point scale (scale A). Site locations on the R. Wharfe and some of

the R. Ure surveys were determined by detailed survey maps produced in 1996 by another contractor (SWRC, 1996) and supplied by Yorkshire Water. The remaining sites on the R. Ure had similar maps supplied by Yorkshire Water but no previous surveys had been completed on the R. Ouse and so site location was determined solely by the grid references supplied. On all but the R. Ouse sites we were therefore certain of exactly repeating the surveys from previous years.

At most of the sites it was possible to complete the surveys by wading in the river channel, but for at least part of six sites (two on each river) the river was too deep and so a grapnel was used to sample a 100m stretch. At these sites the remainder of the survey was completed from the bank, wading in any accessible points. This is one of the recommended amendments to the methodology provided in the 'Blue Book'.

In addition to the 500m survey a second survey was completed over 100m, located in the centre of the 500m reach. This recorded abundance on the 9 point scale (C scale) to provide finer detail for analysis.

The surveys used a standard plant checklist (see survey forms, appendix I) to record species and all specimens were identified at the site were possible. Samples were collected of all species for which detailed examination was required for a definitive identification, including all moss species found. Identification was confirmed at the IFE by the authors or by consultation with external experts (for certain *Potamogeton* samples and for the mosses, of which herbarium samples have been retained at the River Laboratory.).

Species names listed in Stace, 1997 and Hill *et al*, 1992 were used for this report.

2.2 Additional data collection.

Sketch maps were also completed at each site, marking permanent features, large plant stands, areas of shading and any other notable features (included in Appendix II). These maps were not required to the same detail as those produced previously and should not be used to compare changes in plant communities.

Photographs were taken of each site and of the major plant stands present at each to provide a visual record of the conditions. These are supplied in Appendix IV as a seperate document.

2.3 Data analysis.

Average Scores Per Taxon (ASPT) and Mean Trophic Ranks were also calculated for each survey. Both these scores assign a value between one and ten to a list of species. These values reflect the species tolerance to nutrient enrichment with a low value indicating tolerance to high nutrient concentrations and a high value indicating a preference to low nutrient conditions. The scores and species used by the two systems are similar but not identical. For full details refer to HMSO (1986) for ASPT and Dawson *et al* (1996) for MTR.

An ASPT is calculated from the sum of the scores for all species present, divided by the number of scoring species to give a value between 1 and 10. Unlike the ASPT the

as well as species composition at a site The MTR is multiplied by 10 to give a scale between 10 and 100. In both scales a low score indicates nutrient enrichment and a high score indicates a pristine environment.

NCC river types were determined for each site. These classify the reach into one of ten types based on the plant communities present (Holmes *et al*, 1998).

3. Results.

To maintain consistency with the 1996 surveys we have kept the same site numbers on the Wharfe, with site 16 upstream of site 15 and therefore presented in this order in all tables and figures. The new sites on the Ure are given subscripts depending on their location in the downstream order of surveys from 1996 (1b and 2b).

3.1 Macrophyte species from 1997 surveys.

Species lists for the three rivers are presented in Table 1 - Table 6. The full survey forms are provided in appendix I. A total of fifty six species were recorded over the twenty five sites.

Table 2. Species abundance (5 point scale) recorded at 500m survey sites on the river Wharfe, August 1997.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Agrostis stolonifera	1	1					1		1	1			1					
Alisma plantago-aquatica																	1	1
Amblystegium fluviatile				5								1						
Callitriche platycarpa	1	1							1									
Carex riparia	1		1	1			1											
Carex rostrata	1																	
Carex sp.							1											
Cinclidotus fontaniloides		3	2	5		3		1										
Eleocharis palustris							1			1								
Elodea canadensis									1			1	1				3	
Elodea nuttallii			1				1	1	1			3	2	3	2	4		4
Enteromorpha sp.					1					1		1	1	1	1	1	3	
Epilobium hirsutum									1							1	1	1
Equisetum fluviatile	1																	
Filamentous algae	3	2	5	5	4	3	3	3	1	2	1	4	5	5	2	5	5	
Fontinalis antipyretica	4		2	2	3	2	1	1	3	2		1	2		1			1
Fontinalis squamosa	3																	
Groenlandia densa			1				1											
Hildenbrandia rivularis		4	1	1		1		3	2	1		1			3			
Hygrohypnum ochraceaum		1			5													
Juncus articulatus	1																	
Lemanea fluviatilis		1					1											
Lemna minor												1	1	1	1	1	1	
Mentha aquatica	1					1	1	1		1			1					
Mimulus guttatus								1										
Myosotis scorpioides	1	1	1				1	1	1	1	1	1		1		1	1	
Myriophyllum spicatum										3	4	5	4	4	3	4	3	1
Nuphar lutea																		2
Persicaria amphibia																1		1
Petasites hybridus	1							1					1					
Phalaris arundinacea			1	1			2	2	1	2	1	2	2	2	2	2	3	3
Potamogeton x cooperii										3				1				
Potamogeton crispus				1				1	1	2		1		1	1	1		
Potamogeton pectinatus												3	5					
Potamogeton perfoliatus									1	2		3	5	2	1	1	3	3
Racomitrium aciculare					2													
Ran pen. subsp *penicillatus*										3		3	4		2		1	
Ran pen. subsp *pseudofluitans*	1		1	1			1	1		1		3	4	2	1			
Rhynchostegium riparoides	4	3	3			1	3	3	2	2			1	1				
Rorippa sylvestris		1		1			1	1	1				1				1	
Sagittaria sagitifolia																		1
Scapania undulata					3													
Solanum dulcamara							1					1				1		
Sparganium erectum													1	1		1	1	2
Thamnobryum alopecorum	1																	
Veronica beccabunga																	1	
Veronica sp.													1					
Verrucaria sp.				1		1	1											
Viola palustris				1														

Table 3. Species abundance (9 point scale) recorded at 100m survey sites on the river Wharfe, August 1997.

Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Agrostis stolonifera										1								
Alisma plantago-aquatica																		1
Amblystegium fluviatile				6														
Carex riparia			2															
Carex rostrata	1																	
Cinclidotus fontinaloides			1	4				1										
Eleocharis palustris							1											
Elodea canadensis									1								2	
Elodea nuttallii									1				1	2	1	6		3
Enteromorpha sp.					1					2		1		1	2	2	2	
Epilobium hirsutum																	1	1
Equisetum fluviatile	1																	
Filamentous algae	4	2	6	4		2	3	3	2	2	1	6	5	6	5	8	9	
Fontinalis antipyretica	3	2	1	1		1	1		1	1			1		1			
Hildenbrandia rivularis		3	1	1				1	1	1		1			3			
Hygrohypnum ochraceum					6													
Lemanea fluviatilis							1											
Lemna minor													1		1	1	1	
Myosotis scorpioides							1		1	1	1			1		1	2	
Myriophyllum spicatum												6	4	3	4	3	3	
Nuphar lutea																		1
Persicaria amphibia																1		
Petasites hybridus								1					1					
Phalaris arundinacea				1				2	1	3	2		2	2	2	1	1	2
Potamogeton crispus										1								
Potamogeton pectinatus												5	6					
Potamogeton perfoliatus												1	5	3	1		3	3
Potamogeton x suecicus																		
Ran pen. subsp *penicillatus*										1					3		1	
Ran pen. subsp *pseudofluitans*	1		1							3			3	1	2			
Rhynchostegium riparoides	3	2					2	1	1	6								
Rorippa sylvestris													1					
Scapania undulata					2													
Solanum dulcamara																1		
Sparganium erectum																1	1	1
Veronica sp.													1					
Verrucaria sp.							1											

Table 4. Species abundance (5 point scale) recorded at 500m sites on the river Ure, August 1997.

Species	1b	2	2b	3	9
Butomus umbellatus	1			1	2
Callitriche platycarpa	1				
Carex acutiforms	1				
Cinclidotus fontinaloides		1			
Eleocharis palustris	1	1			
Elodea nuttallii					2
Enteromorpha sp.	1	1		1	
Epilobium hirsutum	1				
Filamentous algae	3		1	3	2
Fissidens crassipes			3	2	
Fontinalis antipyretica		1	4	2	
Hildenbrandia rivularis		1	2	1	
Mentha aquatica	1				
Myosotis scorpioides	1	1		1	
Myriophyllum spicatum				1	
Phalaris arundinacea	1	1	1	1	2
Potamogeton pectinatus					3
Ran. pen. subsp *penicillatus*			2	1	
Ran. pen. subsp. *pseudofluitans*		1	2		
Rhynchostegium riparoides		1	4	2	
Rorippa sylvestris	1			1	
Schoenoplectus lacustris					1
Sparganium erectum					2

Table 5. Species abundance (9 point scale) recorded at 100m sites on the river Ure, August 1997.

Species	1b	2	2b	3	9
Butomus umbellatus	2				1
Eleocharis palustris	1	1			
Elodea nuttallii					1
Enteromorpha sp.	1			2	
Filamentous algae	3			3	1
Fissidens crassipes			4	2	
Fontinalis antipyretica		1	3		
Hildenbrandia rivularis			3		
Mentha aquatica	1				
Myosotis scorpioides	1	1		1	
Myriophyllum spicatum				1	
Phalaris arundinacea	1	1	1		2
Ran. pen. subsp *penicillatus*			2		
Ran. pen. subsp. *pseudofluitans*		1	2	1	
Rhynchostegium riparoides			3	2	
Schoenoplectus lacustris					1

Table 6. Species abundance (5 point scale) recorded at 500m sites on the river Ouse, August 1997.

Species	2	1
Butomus umbellatus	3	1
Elodea nuttallii	1	1
Enteromorpha sp.		1
Filamentous algae	1	2
Fontinalis antipyretica	1	
Lemna minor		1
Octodiceras fontanum	1	
Phalaris arundinacea	2	2
Potamogeton pectinatus	4	4
Potamogeton perfoliatus		1
Rorippa sylvestris	1	1
Sparganium emersum	1	

Table 7. Species abundance (9 point scale) recorded at 100m sites on the river Ouse, August 1997.

Species	2	1
Butomus umbellatus	2	1
Enteromorpha sp.		1
Filamentous algae	1	2
Fontinalis antipyretica	1	
Octodiceras fontanum	1	
Phalaris arundinacea	1	1
Potamogeton pectinatus		5
Rorippa sylvestris	1	

3.2 Errors in 1996 survey data.

During the comparisons of 1996 and 1997 survey data it was found that at some sites species were mentioned on the maps or field checklists but not on the summary tables (tables 3.1 and 3.2 in SWRC 1996) and also that some species were entered on the summary tables but were not recorded on the field checklists. These omissions did not enter the ASPT calculations presented in the 1996 report and so the scores will be slightly different to the correct ones presented here. A full check was made of the data from 1996 to ensure that our comparisons were reasonable. The errors found are presented in Table 8.

Table 8. Errors found in 1996 report. (Species found on either the field checklist or the summary table but not on the other are listed, as are species entered on the summary table with the wrong cover value, a key to the abbreviations is provided in Appendix III).

Site No	Recorded on check list but not on summary table.	Recorded on summary table but not on check list.	Incorrect cover value on summary table (correct:on table)
Wharfe			
1	Cer dem, Ver ana, Car nig, Bry pal, Men spi, Mim gut, Col flu, Des ces, Mar pol		Jun art (1:4)
2	Pel end, Ver bec, Tha alo, Men spi, Verr sp.	Ran cal	
3	Verr sp.		Ran cal (2:1)
4	Fis sp., Epi hir, Ran cal, Tha alo, Ror nas aqu (=Nas off), Jun art, Dic pel	Car nig	
5	No survey		
6	Men aqu, Myo sp., Bry pse, Dic pel, Verr sp.		
7	Des ces, Men aqu, Verr sp., Ver ana, Scr aur. (=Scr aqu)		
8	Men aqu, Ver bec, Bry sp., Mni sp., Tha alo.		
9	Ver bec.		
10	Bry pse, Mim gut, Lem min, Ror isl, Men aqu, Ver ana,		
11		Mim gut	
12	Bry pal, Ran cal, Ran pen		
13	Verr sp.		
14	Ror nas aqu (=Nas off), Lem min, Scr aur (=Scr aqu), Men sp.	Jun eff	
16	Ror isl, Verr sp.,	Mim gut	
15	Des ces		
17			Imp gla (1:2)
18	Nup lut		Elodea (3:1)

Ure			
1	Jun art		
2	Verr sp.		
3	Lys vul, Mim gut, Verr sp.		
4	Pel end, Verr sp., Pla ros, Bry sp.		
5	Ent sp.		Pot sue entered twice on table
6	Pel end, Unknown liverwort, Per amp (=Pol amp)		
7	Pel end, Unknown moss, Scr aur (=Scr aqu)	Ran pen, Ran cal	
8	Ver bec, Pot per, Ror syl		
9	Pot per		Spa ere (2:1)

Every site had at least one error and the average number of errors per site was three. Species which were noted on the sketch maps but not elsewhere in the report are not presented here as it is possible that they were outside the actual survey area (i.e. above the area wetted for 85% of the year) but still recorded on the maps for completeness.

3.3 Flow data.

Average Daily Flow data was supplied by Yorkshire Water for one site on each of the rivers surveyed. This has been assessed and is presented as four weekly averages for clarity (Figure 1).

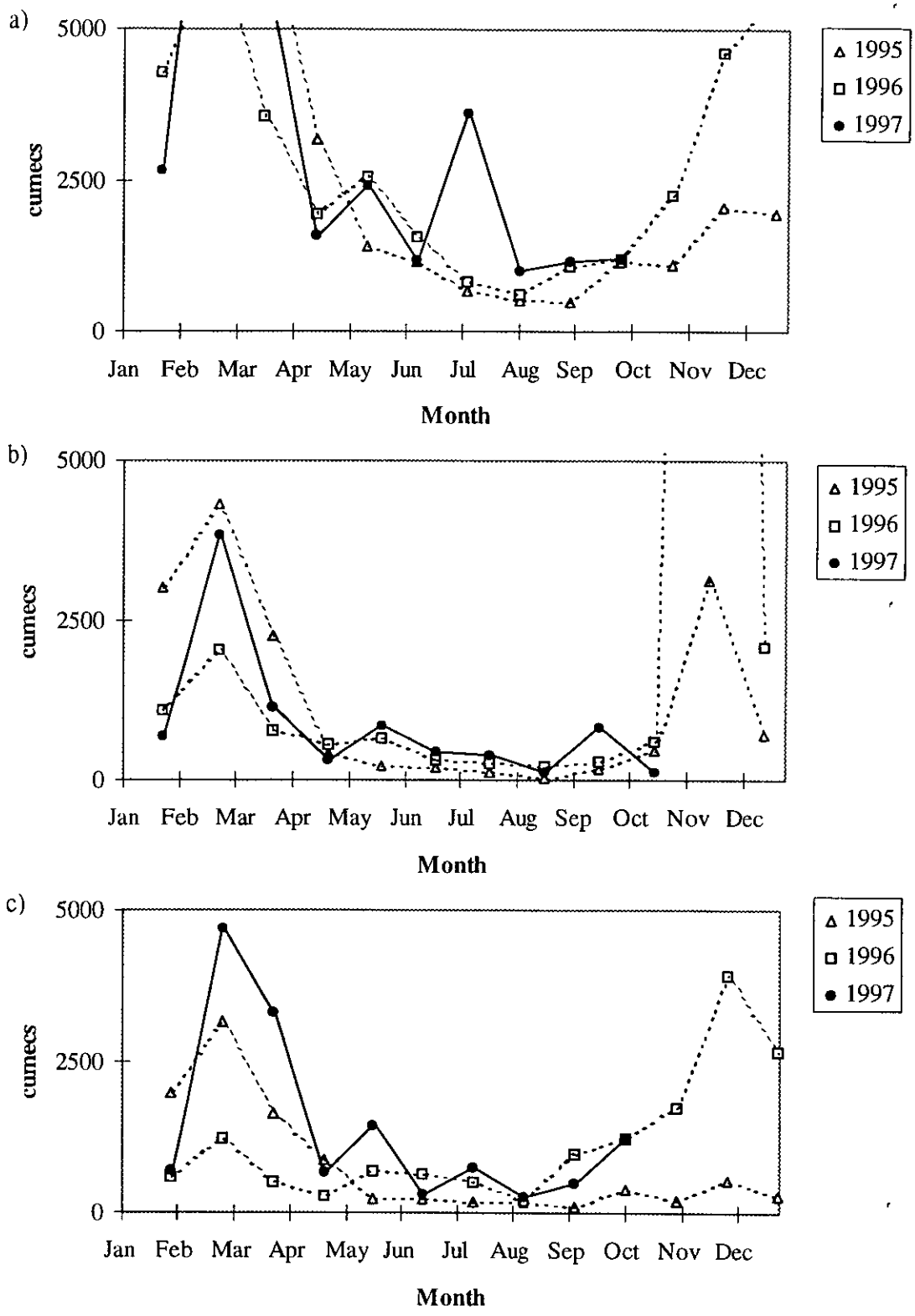


Figure 1. Average monthly flows for a) River Wharfe, b) River Ure and c) River Ouse, 1995-1997.

Flows in 1995 were generally lower than in either 1996 or 1997 at all three monitoring stations. The two years for which surveys have been undertaken were relatively similar in general flow levels although there was a significantly higher flow during July 1997 compared to the same period in 1996 for the River Ouse. This was not apparent in the flow records of the other rivers.

Although summer flows were slightly lower in 1995 there is a more apparent difference in flow volumes in the winter flows than those for the summer periods. Flows from October 1995 through to the spring of 1996 were considerably less than those a year later.

3.4 Comparison of 1996 and 1997 surveys.

The surveys completed in 1997 generally recorded fewer plant species than those from 1996 (Table 8).

Table 9. Numbers of species recorded at 500m survey sites in 1996 and 1997.

Wharfe	No. spp		
	1996	1997	% of 1996
1	36	18	50
2	25	13	52
3	23	14	61
4	30	15	50
5		10	
6	25	12	48
7	32	21	66
8	27	19	70
9	22	18	82
10	32	20	63
11	15	5	33
12	21	22	105
13	19	20	105
14	21	16	76
16	28	16	57
15	14	14	100
17	17	17	100
18	19	11	58

Ure	No. spp		
	1996	1997	% of 1996
1b		12	
2	20	11	55
2b		11	
3	28	16	57
9	19	7	37

3.4.1 Differences in records of marginal species.

A significant number of marginal species (associated with the edges of river habitats, growing near or just in the water) were recorded abundantly in the 1996 surveys but were absent during our surveys of the same sites (Table 9). These contribute to the greater number of species recorded in 1996 compared to 1997 (Table 8).

Table 10. Occurrences, in 1996, of commonly recorded marginal species which were not found at the same site in 1997.

	Wharfe																
Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	16	15	17	18
Agrostis stolonifera			x	x		x		x				x		x	x	x	x	
Caltha palustris	x	x	x	x			x	x							x	x		
Epilobium hirsutum				x			x	x		x	x	x	x	x	x			
Impatiens glandulifera								x	x	x	x	x	x	x	x	x	x	x
Juncus sp(p)			x	x		x	x			x	x			x				
Mimulus guttatus	x	x	x	x		x	x			x				x				
Myosotis scorpioides				x									x		x			x
Rorippa nasturtium-aquaticum	x	x		x			x							x	x			x
Rorippa sylvestris	x		x			x				x		x		x	x			
Veronica beccabunga		x	x			x	x	x	x	x	x	x	x	x	x			

In addition to the higher plants more bryophyte species were recorded in 1996 compared to 1997. Some of these, such as *Bryum pallens, Bryum pseudotriquetrum* and *Dichodontium pellucidium*, are typically found growing close to the waters edge on exposed boulders, tree roots and other surfaces and are not fully aquatic.

3.4.2 Differences in records of aquatic plants.

The following paragraphs detail the changes in populations of aquatic plants recorded at sites on the Wharfe and Ure which were surveyed in both years.

***Ceratophyllum demersum.* - not recorded in 1997**

This species was found at two sites in 1996 (W1, W9) but never in 1997.

***Elodea* species. - changes in occurrences**

Elodea nuttallii and *E. canadensis* were recorded together as *Elodea* species in the 1996 surveys to facilitate estimating the percentage cover by eye (SWRC, 1996). However we were confident that the percentage cover of the two could be accurately estimated in the field by careful surveying and so recorded the two species separately.

The occurrence of *Elodea* species has changed between the 1996 and 1997 surveys. *Elodea* was recorded at three sites on the Wharfe and one on the Ure in 1996 but not in 1997 (sites W4, W10, W11 and U3). *E. nuttallii* and *E. canadensis* were recorded at four sites on the Wharfe (W3, W7, W8 and W9) in 1997 but not found in 1996.

Fontinalis antipyretica. - **increased in 1997**
The aquatic moss *Fontinalis antipyretica* was recorded at thirteen sites in 1997, compared to 4 in 1996.

Groenlandia densa. - **increased in 1997**
This species was recorded at two sites in 1997 (W3 and W7) but not found in 1996.

Hildenbrandia rivularis. - **more records in 1996**
The red encrusting alga, *H. rivularis* was recorded at four more sites in 1996 than in 1997 (W7, W11, W13, W14).

Lemanea fluviatillis. - **more records in 1996.**
This alga was recorded at three sites in 1996 were it was absent in 1997 (W3, W8, W9).

Myriophyllum spicatum. - **no significant difference.**
M. spicatum was recorded at nine sites on the Wharfe in both years, of which eight were the same in both years.

Persicaria amphibia. - **increased in 1997**
Another species recorded on the Wharfe in 1997 (W15, W18) but not found in 1996.

Potamogeton crispus. - **increased significantly in 1997**
The 1997 surveys frequently recorded *P. crispus* on the Wharfe (W4, W8, W9, W10, W12, W14, W15) but it was not noted at all in 1996. *P. crispus* was found at one site on the Ure (U3) in 1996, but not recorded at that site in 1997.

Potamogeton natans. - **only recorded in 1996.**
This species was found at one site on the Wharfe (W18) in 1996 but not in 1997.

Potamogeton pectinatus **and** *P.* **x** *suecicus.* - **changes in location**
P. x *suecicus* is a hybrid of *P. pectinatus* and *P. filiformis* which, particularly in Yorkshire rivers, closely resembles *P. pectinatus* (Preston, 1995). Every effort was made by our surveyors to differentiate the plants and identifications have been confirmed by Chris Preston, author of the BSBI handbook on Potamogetons. Definitive separation of these two plants requires collection of a large amount of plant material, particularly of the young shoots, in order to determine the shape of the stipules (C. Preston - personal communication).

Potamogeton perfoliatus. - **no change between years.**
This plant was recorded at eight sites on the Wharfe in 1996 and nine in 1997, of which seven where the same.

Ranunculus penicillatus **subspecies** *pseudofluitans.* - **increased in 1997**
A greater number of sites had records for this species (previously known as *Ranunculus penicillatus* var. *calcareous*) in 1997 than in 1996, of which three (W1, W8 and W14) did not have records from 1996.

***Ranunculus penicillatus* subspecies *penicillatus*. - increased in 1997**
This subspecies was recorded at fewer sites than subspecies *pseudofluitans* but was also found at one site in 1997 where there are no records from 1996 (W17).

***Typha latifolia*. - not recorded in 1997**
This emergent plant was not recorded at all in 1997 but found at two sites in 1996 (W14 and W18).

3.4.3 Principle changes at sites.

The most significant changes in aquatic communities at are detailed in Table 11.

Table 11. Changes in occurrences of species between 1996 and 1997 at sites surveyed in both years.

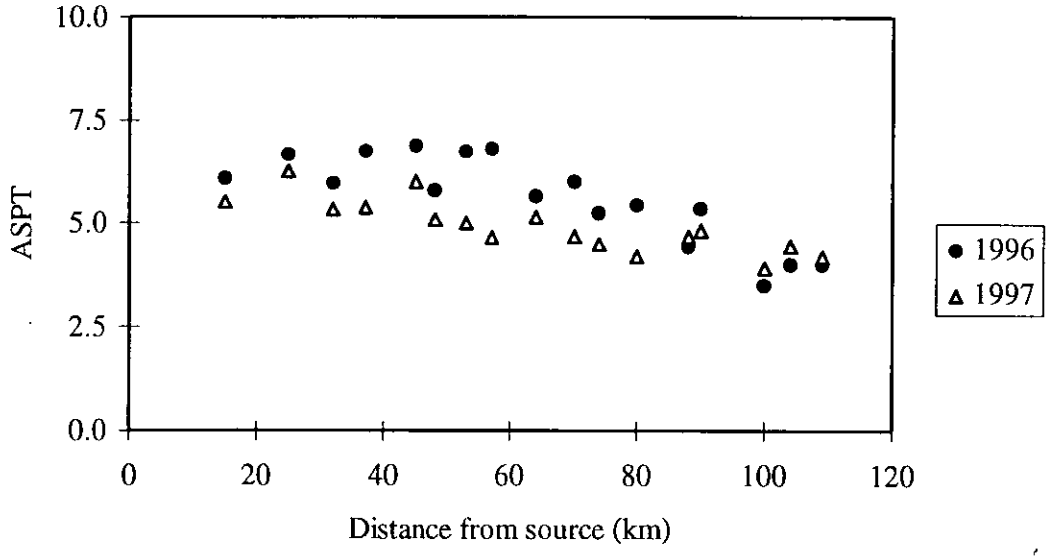
Site No.	Species recorded in 1997 but not in 1996	Species recorded in 1996 but not in 1997
Wharfe		
1	*Ranunculus penicillatus* subsp. *pseudofluitans, Callitriche platycarpa*	*Ceratophyllum demersum*
2	*C. platycarpa*	*Fontinalis antipyretica*
3	*Elodea nuttallii, Groenlandia densa*	*Lemanea fluviatillis*
4	*F. antipyretica, Potamogeton crispus*	*Elodea* sp.
6	*F. antipyretica*	
7	*E. nuttallii, F. antipyretica, G. densa*	*Hildenbrandia rivularis*
8	*E. nuttallii, F. antipyretica, Potamogeton crispus, R. penicillatus* subsp. *pseudofluitans*	*L. fluviatillis, Myriophyllum spicatum*
9	*Elodea canadensis, E. nuttallii, F. antipyretica, Potamogeton crispus, P. perfoliatus*	*C. demersum, L. fluviatillis, R. penicillatus* subsp. *pseudofluitans*
10	*P. crispus*	*Elodea* sp.
11		*Elodea* sp., *P. perfoliatus, H. rivularis*
12	*F. antipyretica, P. crispus, Potamogeton pectinatus*	
13	*F. antipyretica*	*H. rivularis*
14	*Potamogeton x cooperii, P. crispus, R. penicillatus* subsp. *pseudofluitans*	*H. rivularis, Typha latifolia*
16	*F. antipyretica*	*Potamogeton x suecicus*
15	*Persicaria amphibia, P. crispus, P. perfoliatus*	*Iris pseudacorus*
17	*R. penicillatus* subsp. *penicillatus*	
18	*F. antipyretica, M. spicatum, P. amphibia*	*Potamogeton natans*

Ure 2	*R. penicillatus* subsp. *penicillatus*	
3	*M. spicatum, R. penicillatus* subsp. *penicillatus*	*Elodea* sp., *P. crispus, Sparganium emersum*
9		*P. amphibia, P. perfoliatus, S. emersum*

3.5 Plant scores and river types.

The Average Score Per Taxon (ASPT) for each site in both years is shown in Figure 2. The results for the Ouse have been included in the Ure plot as the river is the same body of water but the name changes.

a)



b)

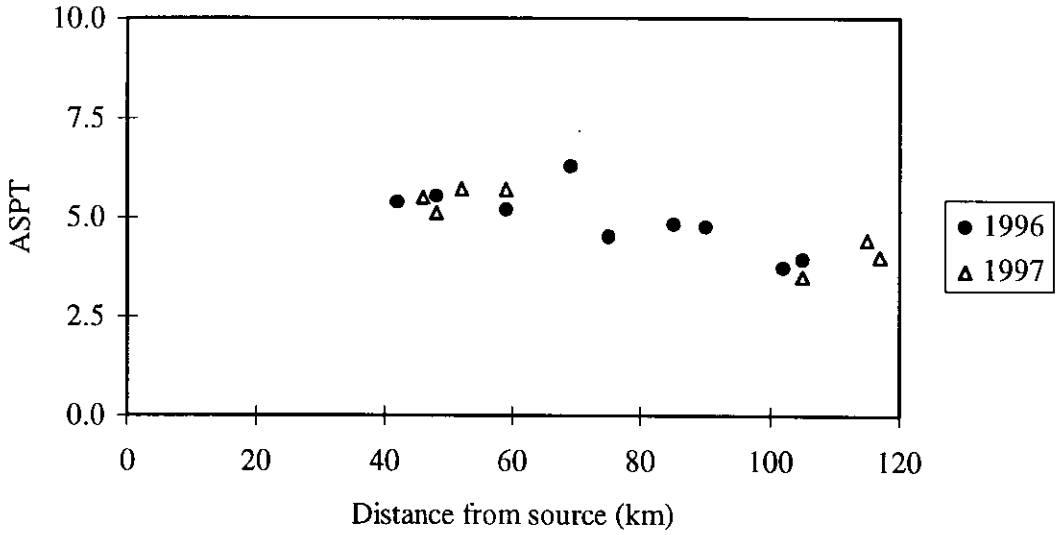
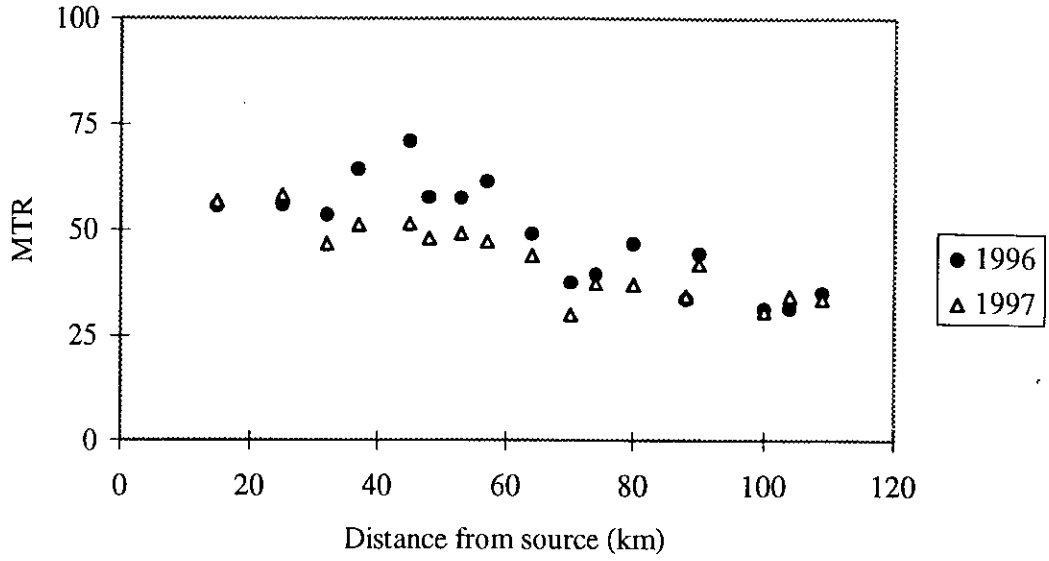


Figure 2. Average Score Per Taxon for 500m sites on a) the river Wharfe and b) the river Ure / Ouse for 1996 and 1997 surveys.

The Mean Trophic Ranks for each site on the Wharfe and Ure / Ouse are shown in Figure 3.

a)



b)

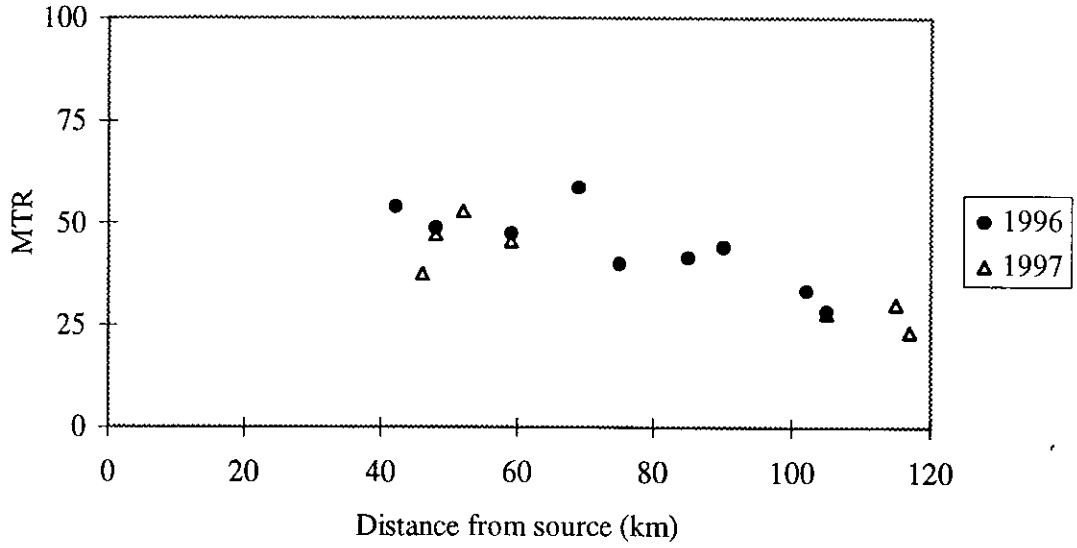


Figure 3. Mean Trophic Rank for 500m sites on a) the river Wharfe and b) the river Ure / Ouse for 1996 and 1997 surveys.

There is a general pattern of decreasing ASPT and MTR scores from upstream to downstream sites on the Wharfe and Ure for both years, although the trend is most noticeable for MTR scores on the Wharfe.

Each survey site has been typed using the NCC river classification which is based on macrophyte occurrences (Table 12, Holmes *et al*, 1998)

Table 12. NCC River Types for sites on the Wharfe, Ure and Ouse.

Site No.	River Type	Type Name
Wharfe		
1	VIII	Oligo-mesotrophic, fast flowing rivers where boulders are common and bryophytes typify the plant assemblages.
2	VIII	
3	VIII	
4	VIII	
5		
6	VIII	
7	V	Rivers of sandstone, mudstone and hard limestone catchments in England and Wales; substrates usually mixed coarse gravels, sands and silts mixed with cobbles and boulders.
8	V	
9	V	
10	VI	Rivers predominately in Scotland and northern England in catchments dominated by sandstone, mudstone and hard limestone; substrates usually mixed coarse gravels, sands and silts mixed with cobbles and boulders.
11	V	Rivers of sandstone, mudstone and hard limestone catchments in England and Wales; substrates usually mixed coarse gravels, sands and silts mixed with cobbles and boulders.
12	V	
13	V	
14	IV	Rivers with impoverished floras, confined to lowlands or eutrophic systems.
16	V	Rivers of sandstone, mudstone and hard limestone catchments in England and Wales; substrates usually mixed coarse gravels, sands and silts mixed with cobbles and boulders.
15	IV	Rivers with impoverished floras, confined to lowlands or eutrophic systems.
17	IV	
18	II	Rivers flowing in catchments dominated by clay.
Ure		
1b	V	Rivers of sandstone, mudstone and hard limestone catchments in England and Wales; substrates usually mixed coarse gravels, sands and silts mixed with cobbles and boulders.
2	VIII	Oligo-mesotrophic, fast flowing rivers where boulders are common and bryophytes typify the plant assemblages.
2b	VIII	
3	VIII	
9	II	Rivers flowing in catchments dominated by clay.
Ouse		
1	(X)	Probably classified incorrectly due to low number of plants recorded (Ultra oligotrophic streams in mountains)
2	(X)	

(Note: The NCC classification should be derived from 1km surveys which include bank species. Therefore 1996 surveys have been used for these types where possible as the greater number of marginal species present are more representative of inclusion of a bank survey.)

3.6 Comparison between 500m and 100m surveys.

The additional 100m surveys were completed by the same surveyors during the same visit as the 500m surveys. They were located in the centre of each 500m section and recorded plant cover in greater detail, using the 9 point scale.

By reducing the survey area a proportion of plant species were missed for each site. On average the 100m surveys recorded 60 percent of the species found over the full 500m. A smaller proportion of the species were present within the 100m section in the upper reaches of the rivers (40-50%) compared to sites further downstream (60-100%), probably due to the greater habitat variation in the upper reaches.

The Mean Trophic Rank for the 100m reach is generally not significantly different from the value for the 500m reach (Figure 4). The cases where the MTR is less for the 100m survey are due to the low number of scoring species being present in the site, when the absence of one or two from the shorter survey can significantly affect the MTR.

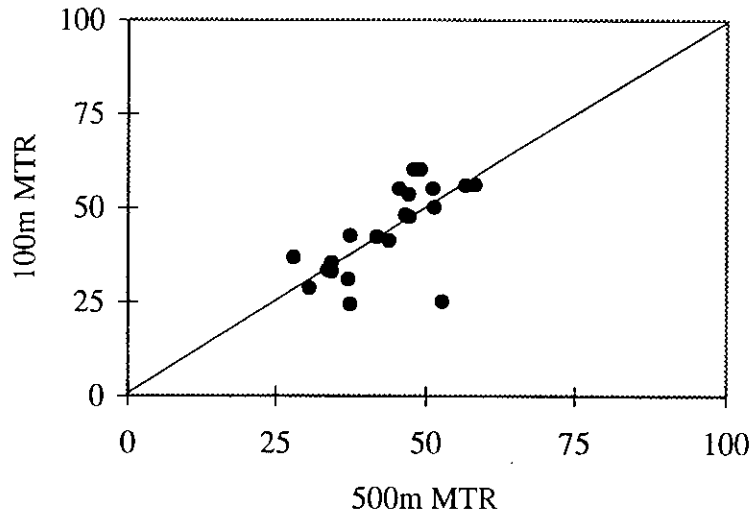


Figure 4. Mean Trophic Rank for 100m surveys against the 500m survey at the same site.

4. Discussion.

4.1 Assessment of the condition of the 1997 macrophyte populations.

In general the macrophytes themselves showed few or no signs of stress from low flow/flow changes in the three rivers. Sites 13 and 18 on the Wharfe were noted as having particularly healthy plant populations.

With the exception of site W5 (on the Dibb) bryophyte populations were in good condition and not obviously stranded on rocks that would normally be immersed. The exception was the Dibb site, where water level did appear to be lower than usual with exposed mosses showing signs of dehydration and general stress. This site is directly below a reservoir so the flow levels will be heavily controlled.

Site 10 on the Wharfe was noted as having a high density of diatoms covering macrophytes at one end of the site, where there was very little perceptible flow. Near the Otley sewage works (W11) outfall there were particularly dense stands of *Myriophyllum spicatum* and sewage fungus, suggesting an increase in the trophic status of the site.

The Average Score Per Taxon (ASPT) and the Mean Trophic Rank (MTR) for each river indicate a gradual transition from the upland reaches were nutrient concentrations are low to the lowland reaches with an increased nutrient loading (Figure 2 and Figure 3). The down river trends are consistent with those on other rivers on which similar surveys have been completed (e.g. R. Eden and R. Ribble, Dawson *et al*, 1996)).

The 100m surveys at each site were similar to the 500m surveys, although a smaller number of species were recorded. The extra detail provided by using the 9 point scale did not prove of benefit for this study as there are no comparable 100m surveys from previous years.

4.2 Assessment of possible drought impacts.

Aquatic plant populations are variable, responding to changes in the environment as well as natural cycles of colonisation, displacement and competition. Human impacts on the river corridor can also affect the plant population, through dredging, weed control, pollution or other activities. In order to detect any impact of flow changes/drought on a site it is therefore necessary to predict the changes which would occur and then separate them from changes driven by other factors.

Changes in macrophyte abundance as a result of drought and changes in water levels and flow rates are complex and it does not follow that smaller volumes of water result in fewer species surviving in the river. Instead there are a number of changes in the community which could occur over a time scale of 1-5 years including changes in the species composition of a site, increase in the numbers of marginal plants and damage to submerged plants due to lower water levels.

Reduced flows will lead to a number of changes in the habitats within a river. Scouring of the bed and banks will be reduced as the frequency and intensity of spate flows is

lessened. This will increase siltation and decrease the tendency of poorly or not rooted plants to be washed out in higher flows. Marginal plants may increase in abundance as they colonise more stable sediment deposits at the fringes of the channel, as will aquatic species which prefer soft sediment deposits. Species which prefer clean gravel substrates and higher flows will tend to be less abundant or lost from the site.

A decrease in water depth will have the most significant impact where this results in plants being exposed to the air. Additionally, shallower water will favour a different plant community. Different plants have different optimum depths for growth. If the lower water level means a plant is growing in an unsatisfactory position it will suffer and may be lost. For example during the 1976 drought, changes in water level from over to under 20cm caused a loss in Ranunculus species in 25% of sites and changes from over 40cm to under 20cm caused a loss of *Sparganium emersum* from 50% of sites (1400 sites UK sites included in survey) (Haslam, 1987).

Our surveys, completed during August 1997, generally recorded fewer species than those conducted by another contractor during 1996 (Table 8). A significant proportion of the additional species recorded in the earlier surveys are more commonly associated with marginal rather than fully aquatic habitats (Table 9).

Flow levels were similar at the times of the 1996 and 1997 surveys in all three rivers (Figure 1) and so the greater numbers of marginal plants in 1996 cannot be attributed to distortion of the survey area by high flows. As stated above one of the consequences of low flows could be an increase in marginal species such as those mentioned in Table 9. The greater number of occurrences of these species suggests a possible reduction in the scouring effect of spate flows in 1996 compared to 1997 which allowed the marginals to grow more abundantly. In particular the flows in the winter of 1995-96 were significantly lower than in 1996-97 which would have reduced the erosive power of the winter flows, leaving established marginals to grow for the 1996 survey period. Winter flow levels can be as important as those in summer in determining river plant communities and appear to be the major cause of differences between 1996 and 1997.

Submerged aquatic plant populations were more variable than the marginals, with species being recorded at a site in one year but not the other. As with the marginals the causes of the changes are difficult to establish. In general a reduction in flow velocity will lead to a loss of species such as *Ranunculus* spp. and *Potamogeton pectinatus* which prefer higher velocities and an increase in plants such as *Elodea* spp. and *Callitriche* spp. which are generally poorly rooted and so may be washed away in high flows.

A few studies have established habitat preferences for *Ranunculus* spp. and *Rorippa nasturtium aquaticum* in British rivers (Dawson, 1976, Mountford and Gomes, 1990 and NRA, 1993). The most suitable habitat for *Ranunculus* spp. (as a composite of *fluitans/ penicillatus/ aquatilis*) is a flow velocity of 15-50 cms^{-1} and a depth of 15-45(60) cm. For *R. nasturtium aquaticum* the preference is for a velocity of 20-45 cms^{-1} and a depth of 25-60 cm. During drought both the velocity and the depth of water can fall, possibly enough to make the habitat less suitable for these species.

Ranunculus spp were found more frequently in 1997 than in 1996 which may be due to changes in the habitat. However there is insufficient evidence from the two years surveys to conclude that drought impacts were less in 1997.

The most obvious changes in aquatic plants between years where the number of sites at which *Fontinalis antipyretica* and *Potamogeton crispus* where recorded. Both where found at many more sites in 1997 than in 1996, which might be attributable to more favourable flow conditions but there is insufficient evidence for firm conclusions. On a site by site basis there are no consistent trends in terms of species lost or gained in 1997 compared to 1996 (Table 10) which would indicate drought impacts or recovery.

Although neither the ASPT or MTR are designed to monitor changes in water levels the consequences of such changes may manifest themselves through changes in the scores at a site between years. Any significant change in plant community will lead to a change in MTR or ASPT score as the plants are unlikely to be replaced by ones with a similar score. For example loss of *Ranunculus* species and an increase in *Elodea* spp. and *Myriophyllum* spp. will lower the scores. A change in MTR of greater than 15% is indicative of a change in nutrient status and a similar magnitude change between years at the sites could reflect an impact of drought. However it could also reflect other impacts and equally any drought induced changes may not be detected by the system.

Significant differences in MTR were recorded at sites 4, 6 and 9 on the Wharfe, in each case the lower score being from 1997. For sites 4 and 6 this is due to a greater number of bryophyte species being recorded in 1996, which generally have high scores associated with them. At site 9 the difference is due more to the presence of a number of relatively low scoring plants in 1997, such as *E. nuttallii, Potamogeton crispus,* and *P. perfoliatus.* As there is no consistent trend of significantly reduced ASPT or MTR scores in 1997 it is unlikely that the changes at these three sites could be attributed to changes in flow conditions.

A national average MTR has been calculated for each of the NCC river types, as well as an average for the top ten percent of scores (Dawson *et al,* 1996), which can be used to establish if the Wharfe, Ure and Ouse sites are degraded in comparison. All the MTRs, for both years, are considerably less than the top ten percent average and most are also less than the full average. Except for some of the upstream sites on the Wharfe (W3, 4 and 6), and on the Ure, the differences are not great. Water quality is good (GQA 90 class A and B) at all the sites except site 12 on the Wharfe, where it is fair (GQA 90 class C) and the differences in MTR between the national averages should not be taken to indicate increased nutrient concentrations without additional evidence.

5. Conclusions.

Two years data are now available for assessment of drought impact on the rivers Wharfe and Ure. Our surveys, completed in 1997, where at exactly the same sites and at the same time of year as those from 1996, with some additional sites included on the Ure, Ouse and one on the Dibb, a tributary of the Wharfe (site number W5).

Analysis of the two years data highlighted a number of differences, the most significant of which was the number of marginal species recorded in the two years. Far more were recorded in 1996 compared to our surveys which could be a result of substantially lower flows in the 1995-96 winter compared to the 1996-97 period. The lower flows would have caused less erosion of marginal deposits in which the plants had become established, meaning they were abundant in the following growing season.

Changes in fully aquatic macrophytes were also observed but there was no clear trend between sites, although several species were recorded more frequently in 1997 (*Fontinalis antipyretica, Elodea* spp., *Potamogeton crispus* and two *Ranunculus penicillatus* subspecies). In general species where recorded at some sites in 1997 but not in 1996 whilst at other sites they were recorded in 1996 but not in 1997. These changes are more attributable to natural cycles than to drought impacts.

Although there is evidence that winter low flows had an impact on the marginal plants recorded in 1996 these effects had disappeared by 1997 and further surveys would be needed to establish which is the normal situation.

There is insufficient evidence from the two years study to determine whether or not there have been any impacts of drought on the aquatic macrophyte populations or if further reduction in water levels would have a greater effect. There have not been any significant losses of species or dramatic changes that would indicate a negative impact and it is likely that any changes which are apparent would be expected during any two year period. However, comparisons with historic surveys are needed to establish a proper baseline for the rivers. These data may be available through negotiation with English Nature for access to the Conservation Rivers database, which contains surveys from the 1970s and 80s for the rivers included in this survey.

Macrophyte populations naturally fluctuate, both in relative abundance of species and in actual species present within a short distance. In order to establish the magnitude of natural changes on the Ure, Ouse and Wharfe we recommend a continuing survey programme at the same time of year for at least one more year. Any impacts of earlier drought could then be more clearly established.

For further surveys it is unlikely to be necessary to complete both a 100m and a 500m survey. There is a balance between the level of extra detail recorded in the 100m surveys compared to the loss of a proportion of the species present. For the purposes of continued monitoring we suggest that the 100m survey would superfluous to requirements as, with fewer species recorded, some changes may be overlooked which is probably more significant than the extra level of detail. Provided time is available we recommend continuing with a 500m survey using scale C.

6. References.

Dawson, F.H. (1976). The annual production of the aquatic macrophyte *Ranunculus penicillatus* var. *calcareus* (R.W. Butcher) C.D. K. Cook. *Aquatic Botany. 2, 51-73.*

Dawson, F.H., J.R.Newman and M.J.Gravelle. (1996). Mean Trophic Rank Macrophyte Survey. An assessment of the trophic status of rivers using macrophytes. *NERC R&D Interim Report for the Environment Agency.*

Haslam, S.M. (1987). River plants of Western Europe. *Cambridge University Press, Cambridge.*

Hill, M.O., C.D. Preston and A.J.E. Smith. (1992). Atlas of the bryophytes of Britain and Ireland (Volumes I-III). Harley Books, Colchester.

HMSO, (1987). Methods for the use of aquatic macrophytes for assessing water quality 1985-86 'Blue book'. *Her Majesty's Stationery Office.*

Holmes, N.T.H, P.J. Boon and T.A. Rowell (1998). A revised classification system for British rivers based on their aquatic plant communities. *Aquatic Conservation - Special edition, Classification of rivers. In Press.*

Mountford, O. and N. Gomes (1990). Habitat preferences of river water-crowfoot (*Ranunculus fluitans* Lam.) for application in PHABSIM testing. *Report to the Institute of Hydrology.*

NRA, (1993). Ecologically acceptable flows. Assessment of instream flow incremental methodology. *NRA report.*

Preston C.D. (1995). Pondweeds of Great Britain and Ireland. *B.S.B.I Handbook No. 8. London.*

Stace, C. (1997). New flora of the British Isles, Second edition. Cambridge University Press, Cambridge.

SWRC, (1996). Rivers Wharfe and Ure macrophyte surveys. *Scott Wilson Resource Consultants. Report for Yorkshire Water Services Ltd.*

Appendix I. Survey forms.

Macrophyte Survey Form

River: Wharfe
Site name: WS Starbotton (1)
Length: 500m
Scale used: A (delete as appropriate)

NGR: SD 946756
Date: 6/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	5	4
Fontinalis squamosa	4	3
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	4	4
Sphagnum species		
Thamnobryum alopecurum	1	1
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile	1	1
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia	1	1
Carex rostrata	1	1
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Agrostis stolonifera		1	1
Juncus articulatus		1	1
Callitriche platycarpa		1	1
Myosotis scorpioides		1	1
Mentha aquatica		1	1
Petasites hybridus		1	1
Filamentous algae		4	3

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [3] >10-20 ___% [3] >20 ___% [ ]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [2]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [3]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [1] Slack ___% [1] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [2] Mod. ___% [2] Dense ___% [ ]

Right Bank None ___% [2] Slight ___% [2] Mod. ___% [3] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Starbotton(1)
Length: 100m
Scale used: A B C (delete as appropriate)

NGR: SD 946756
Date: 6/8/97
Surveyor: DS IPJ

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		3
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		1
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		1
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			4

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [3] >5-10 ___% [2] >10-20 ___% [ ] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [1] Riffle ___% [1] Run ___% [3]

Shading: Left Bank None ___% [ ] Slight ___% [2] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [3] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: d/s Conistone Bridge (2)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SD 980672
Date: 6/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	2	4
Lemanea fluviatillis	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	4	3
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa	5	3
Hygrohypnum luridum		
Hygrohypnum ochraceum	1	1
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	4	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgans		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		1	1
Agrostis stolonifera		1	1
Rorippa sylvestris		1	1
Callitriche platycarpa		1	1
Filamentous algae		1	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [3] >10-20 ___% [3] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [2] >0.5-1 ___% [ ] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [1] Slack ___% [3] Riffle ___% [1] Run ___% [2]

Shading: Left Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [1] Slight ___% [1] Mod. ___% [3] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: d/s Conistone Bridge (2)
Length: 100m
Scale used: ~~A~~/ C (delete as appropriate)

NGR: SD 980672
Date: 6/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		3
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			2

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [1] >10-20 ___% [3] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [2] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [3] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Whorfe
Site name: u/s Hebden (3)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 015626
Date: 7/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	2	2
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	2	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	4	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia	1	1
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa	1	1
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		5	5
Myosotis Scorpioides		1	1
Phalaris arundinacea		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [1] >10-20 ___% [3] >20 ___% [1]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [2] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [1] Slack ___% [2] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [2] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Hebden (3)
Length: 100m
Scale used: ~~M~~ C (delete as appropriate)

NGR: SE 015626
Date: 7/8/97
Surveyor: OS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		2
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Filamentous algae			6

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [1] >10-20 ___% [3] >20 ___% [ ]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [2] >0.5-1 ___% [2] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [1] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [3] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: Appletreewick (4)
Length: 500m
Scale used: A 🔍 (delete as appropriate)

NGR: SE 042602
Date: 7/2/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile	5	5
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	4	5
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	3	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris	1	1
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia	1	1
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		1	1
Rorippa sylvestris		1	1
Filamentous algae		3	5
Verrucaria sp.		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [1]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [3] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [3] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [1] Slack ___% [2] Riffle ___% [3] Run ___% [3]

Shading: Left Bank None ___% [1] Slight ___% [2] Mod. ___% [3] Dense ___% [3]

Right Bank None ___% [3] Slight ___% [2] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Appletreewick (4)
Length: 100 m
Scale used: A B C (delete as appropriate)

NGR: SE 042 602
Date: 7/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		6
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		4
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Filamentous algae			4

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [1]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [3] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [3] Dense ___% [ ]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [2] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [3] Unstble ___% [ ] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Dibb (Wharfe)
Site name: u/s Dibbles Bridge (S)
Length: 100 m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 054637
Date: 7/8/97
Surveyor:

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		2
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		6
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [3] >10-20 ___% [ ] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [2] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [3] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [1]

Shading: Left Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [2] Cloudy ___% [3] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [2] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Dibb (Wharfe)
Site name: u/s Dibbles Bridge (S)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SE 054 637
Date: 7/8/97
Surveyor: DS / PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata	4	3
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa	4	3
Hygrohypnum luridum		
Hygrohypnum ochraceum	6	5
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare	3	2
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		4	4

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [2] >5-10 ___% [3] >10-20 ___% [1] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [3] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [1] Run ___% [1]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [2]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [1] Cloudy ___% [3] Turbi ___% [ ]

Bed Stability Firm ___% [1] Stable ___% [2] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4):
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Whorfe
Site name: dis Strid (6)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SE 080551
Date: 8/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	3	3
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	2	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgans		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		3	3
Mentha aquatica		1	1
Veronica sp.		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [2]

Substrate Bedrock ___% [1] Boulders ___% [2] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [2] Run ___% [2]

Shading: Left Bank None ___% [2] Slight ___% [ ] Mod. ___% [2] Dense ___% [2]

Right Bank None ___% [3] Slight ___% [1] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [2] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: dls Strid (6)
Length: 100 m
Scale used: ~~B~~ C (delete as appropriate)

NGR: SE 080551
Date: 8/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Filamentous algae			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [1] Slight ___% [1] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Whorfe
Site name: u/s Lobwood (7)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SE 072523
Date: 8/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis	1	1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia	1	1
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris	1	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa	1	1
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Agrostis stolonifera		1	1
Carex sp		1	1
Filamentous algae		3	3
Mentha aquatica		1	1
Myosotis scorpioides		1	1
Phalaris arundinacea		4	2
Rorippa sylvestris		1	1
Solanum dulcamara		1	1
Veronica sp		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [1]

Substrate Bedrock ___% [1] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [1] Slack ___% [2] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [ ]

Right Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [1] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: U/S Lobwood (7)
Length: 100m
Scale used: ☒ C (delete as appropriate)

NGR: SE 092523
Date: 8/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		1
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			3
Myosotis scorpioides			1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [ ] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Addingham (d/s weir)(8)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 091489
Date: 9/8/97
Surveyor: DS / PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	3
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	5	3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	1	1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		3	3
Mentha aquatica		2	1
Mimulus guttatus		1	1
Myosotis scorpioides		2	1
Petasites hybridus		2	1
Phalaris arundinacea		3	2
Rorripa sylvestris		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [2]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [2]

Substrate Bedrock ___% [1] Boulders ___% [1] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [2] Run ___% [2]

Shading: Left Bank None ___% [1] Slight ___% [ ] Mod. ___% [3] Dense ___% [2]

Right Bank None ___% [3] Slight ___% [1] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [1] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: Addingham (d/s weir)(E)
Length: 100m
Scale used: ~~C~~ C (delete as appropriate)

NGR: SE 091489
Date: 1/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Filamentous algae			3
Petasites hybridus			1
Phalaris arundinacea			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [ ]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [ ] Riffle ___% [3] Run ___% [2]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [3] Dense ___% [1]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Ilkley (9)
Length: 500m
Scale used: A 🚗 (delete as appropriate)

NGR: SE 124484
Date: 10/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	2
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	5	3
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	2	2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis	1	1
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Agrostis stolonifera		1	1
Callitriche platycarpa		1	1
Epilobium hirsutum		1	1
Filamentous algae		1	1
Myosotis scorpioides		1	1
Phalaris arundinacea		1	1
Rorippa sylvestris		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [2] >0.5-1 ___% [3] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [1]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [1] Run ___% [2]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Ilkley (9)
Length: 100m
Scale used: ~~B~~ C (delete as appropriate)

NGR: SE 124484
Date: 10/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		9
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			2
Myosotis scorpioides			1
Phalaris arundinacea			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [2] >0.5-1 ___% [3] >1.0 ___% [2]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: d/s Burley (10)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 175463
Date: 10/8/97
Surveyor: PS/DS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis	1	1	*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatillis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*	4	3	*Potamogeton crispus*	3	2
Enteromorpha sp	2	1	*Nuphar lutea*			*Potamogeton freisii*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg.			*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*			*Potamogeton pectinatus*		
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*	3	2
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*	2	1	*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*	5	3	*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton trichoides*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*		
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*		
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Aacostis stolonifera	1	1
Dichodontium flavescens			*Veronica anagallis-aquatica*			Filamentous algae	2	2
Dichodontium palustre			*Veronica catenata*			Mentha aquatica	1	1
Dicranella palustris			*Veronica scutellata*			Myosotis scorpioides	1	1
Fontinalis antipyretica	2	2	*Viola palustris*			Phalaris arundinacea	2	2
Fontinalis squamosa			MONOCOTYLEDONS			Potamogeton x cooperi	4	3
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*					
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*					
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides	3	2	*Carex acutiforms*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*	1	1			
Equisetum palustre			*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*					
Apium inundatum			*Elodea nuttallii*					
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*					

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [3] >1.0 ___% [2]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [1] Slight ___% [2] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [1] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: d/s Burley (10)
Length: 100m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 175463
Date: 16/8/97
Surveyor: PS IDS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		2
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		6
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		3
Ran. penic. subsp *penicillatus*		1
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Agrostis stolonifera			1
Myosotis scorpioides			1
Phalaris arundinacea			3
Filamentous algae			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [1] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [ ] Riffle ___% [2] Run ___% [3]

Shading: Left Bank None ___% [2] Slight ___% [3] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [2] Slight ___% [3] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Knotford (11)
Length: 500m
Scale used: A (delete as appropriate)

NGR: SE 223463
Date: 10/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	5	4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		1	1
Phalaris arundinacea		2	1
Myosotis scorpioides		2	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [1] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [1] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [1] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Whafe
Site name: Knottford (11)
Length: 100m
Scale used: ~~A~~ B C (delete as appropriate)

NGR: SE 223443
Date: 10/8/97
Surveyor: PS/DS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		5
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Filamentous algae			1
Myosotis scorpioides			1
Phalaris arundinacea			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [1] Silt/Mud ___% [2] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [1] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Riffa Beck (12)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 255456
Date: 11/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile	1	1
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	5	5
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	4	3
Ran. penic. subsp *penicillatus*	4	3
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis	1	1
Elodea nuttallii	4	3
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	4	3
Potamogeton perfoliatus	4	3
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	2
Myosotis scorpioides		1	1
Solanum dulcamara		1	1
Filamentous algae		5	4

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [3] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [2] Run ___% [2]

Shading: Left Bank None ___% [ ] Slight ___% [2] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [ ] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: U/S Riffa Beck (12)
Length: 100m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 255456
Date: 11/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		6
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		5
Potamogeton perfoliatus		1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			3
Filamentous algae			6

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [2] Mod. ___% [3] Dense ___% [1]

Right Bank None ___% [ ] Slight ___% [2] Mod. ___% [3] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4):
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: The Nunnery (13)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 288455
Date: 11/8/97
Surveyor: PS IDS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	2	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	3	4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	3	4
Ran. penic. subsp *penicillatus*	3	4
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis	2	1
Elodea nuttallii	2	2
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	5	5
Potamogeton perfoliatus	5	5
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	2	1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Agrostis stolonifera		1	1
Filamentous algae		4	5
Mentha aquatica		1	1
Petrasites hybridus		1	1
Phalaris arundinacea		2	2
Rorippa sylvestris		1	1
Veronica sp.		1	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [3] Run ___% [3]

Shading: Left Bank None ___% [ ] Slight ___% [2] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: The Numbers (13)
Length: 100m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 288455
Date: 11/8/97
Surveyor: PS/DS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		4
Myriophyllum spicatum		4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		3
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		6
Potamogeton perfoliatus		5
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2
Veronica sp.			1
Rorippa sylvestris			1
Potamogeton Hybridus			1
Filamentous algae			5

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% ☐ >1.0 ___% ☐

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% ☐ Clay ___% ☐ Peat ___% ☐ Not visible ☐

Habitat Pool ___% ☐ Slack ___% [3] Riffle ___% ☐ Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% ☐ Mod. ___% ☐ Dense ___% [2]

Right Bank None ___% [3] Slight ___% ☐ Mod. ___% ☐ Dense ___% ☐

Water Clarity Clear ___% [3] Cloudy ___% ☐ Turbi ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Collingham (14)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 354457
Date: 11/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	1	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgans		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	5	4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	3	2
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	4	3
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	4	2
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	1	1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea		1	2
Myosotis scorpioides		1	1
Potamogeton x cooperii		2	1
Filamentous algae		5	5

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [2] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [3] >1.0 ___% [2]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [2] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [2] Run ___% [1]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [2] Mod. ___% [2] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [2]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		
Algae		
Others		

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Collingham (14)
Length: 100 m
Scale used: ☒ C (delete as appropriate)

NGR: SE 354457
Date: 11/8/97
Surveyor: DS/DS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		3
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		2
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		3
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Myosotis scorpioides			1
Phalaris arundinacea			2
Filamentous algae			6

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [2]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [1] >0.5-1 ___% [3] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [2] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [1]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [1] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [1] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [2] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: Boston Spa (15)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SE 423465
Date: 12/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	3
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	2	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	5	3
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	3	1
Ran. penic. subsp *penicillatus*	4	2
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	2	2
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	1	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	2
Filamentous algae		1	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [1] >0.5-1 ___% [3] >1.0 ___% [2]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [3]

Sand ___% [1] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [1] Run ___% [1]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [2] Mod. ___% [3] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [1]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4).
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: Boston Spa (15)
Length: 100m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 42346T
Date: 12/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		3
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		2
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		2
Ran. penic. subsp *penicillatus*		3
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2
Filamentous algae			5

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [3] >0.5-1 ___% [3] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [2] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [1]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [3] Dense ___% [1]

Right Bank None ___% [1] Slight ___% [2] Mod. ___% [2] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4):
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Woodhall Hotel (16)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 369467
Date: 12/8/97
Surveyor: DS / PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	4	4
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium	1	1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	4	4
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus	1	1
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	2	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	2	1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	2
Epilobium hirsutum		1	1
Myosotis scorpioides		1	1
Solanum dulcamara		1	1
Filamentous algae		5	5

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [1] >0.5-1 ___% [2] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [1] Gravel ___% [2]

Sand ___% [2] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [2] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Woodhall Hotel (16)
Length: 100m
Scale used: ~~A~~/ C (delete as appropriate)

NGR: SE 369467
Date: 12/8/97
Surveyor: DS/OS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatilis		
Vaucheria sp		
Enteromorpha sp		2
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		3
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		6
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Myosotis scorpioides			1
Solanum dulcamara			1
Filamentous algae			8

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [2] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [2] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Newton Kyme (17)
Length: 500 m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 455457
Date: 12/8/97
Surveyor: DS/PS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis			*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatilis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*	4	3	*Potamogeton crispus*		
Enteromorpha sp	3	3	*Nuphar lutea*			*Potamogeton freisii*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg.			*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*			*Potamogeton pectinatus*		
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*	4	3
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*			*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*	3	1	*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton trichoides*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*		
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*	2	1
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Myosotis scorpioides	2	1
Dichodontium flavescens			*Veronica anagallis-aquatica*			Phalaris arundinacea	3	3
Dichodontium palustre			*Veronica catenata*			Epilobium hirsutum	2	1
Dicranella palustris			*Veronica scutellata*			Rorippa sylvestris	2	1
Fontinalis antipyretica			*Viola palustris*			Veronica beccabunga	2	1
Fontinalis squamosa			MONOCOTYLEDONS			Filamentous algae	5	5
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*	2	1			
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*					
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides			*Carex acutiforms*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*					
Equisetum palustre			*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*	4	3			
Apium inundatum			*Elodea nuttallii*					
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*	2	1			

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [2] >0.5-1 ___% [3] >1.0 ___% [1]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [2]

Sand ___% [3] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [3] Stable ___% [ ] Unstble ___% [3] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Whafe
Site name: u/s Newton Kyme (17)
Length: 100m
Scale used: ~~A~~/ C (delete as appropriate)

NGR: SE 455457
Date: 12/8/97
Surveyor: OS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		2
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		3
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		1
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		2
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		3
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Myosotis scorpioides			2
Epilobium hirsutum			1
Filamentous algae			9

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [2] >0.5-1 ___% [3] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [2]

Sand ___% [3] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [3] Mod. ___% [2] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [2] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [1] Stable ___% [ ] Unstble ___% [3] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Tadcaster Weir (R)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 485439
Date: 12/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	2	1
Nuphar lutea	3	2
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium	2	1
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica	1	1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	5	4
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus	5	3
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia	2	1
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum	2	2
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Epilobium hirsutum		2	1
Phalaris arundinacea		4	3

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 ___% [3]

Depth (m) <0.25 ___% ☐ 0.25-0.5 ___% ☐ >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% [1]

Sand ___% ☐ Silt/Mud ___% [1] Clay ___% ☐ Peat ___% ☐ Not visible [3]

Habitat Pool ___% ☐ Slack ___% [3] Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None ___% ☐ Slight ___% [2] Mod. ___% ☐ Dense ___% [3]

Right Bank None ___% ☐ Slight ___% [1] Mod. ___% [2] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% ☐ Turbi ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble ___% ☐ Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Wharfe
Site name: u/s Tadcaster Weir (18)
Length: 100m
Scale used: ~~A~~/ C (delete as appropriate)

NGR: SE 4854 39
Date: 12/8/97
Surveyor: DS / PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		1
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		1
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		3
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		3
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		1
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			2
Epilobium hirsutum			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [3] Mod. ___% [ ] Dense ___% [2]

Right Bank None ___% [ ] Slight ___% [1] Mod. ___% [2] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: Ulshaw (1b)
Length: 500m
Scale used: A / ~~B~~ (delete as appropriate)

NGR: SE 145872
Date: 14/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	5	1
Carex acuta		
Carex acutiforms	2	1
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris	2	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Callitriche platycarpa		1	1
Epilobium hirsutum		1	1
Filamentous algae		3	3
Mentha aquatica		1	1
Myosotis scorpioides		1	1
Phalaris arundinacea		2	1
Rorippa sylvestris		1	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [2] >0.5-1 ___% [ ] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [1] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [2] Clay ___% [1] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [1] Slight ___% [1] Mod. ___% [2] Dense ___% [3]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: Ulshaw (16)
Length: 100 m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 145872
Date: 14/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		2
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			3
Mentha aquatica			1
Myosotis scorpioides			1
Phalaris arundinacea			1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [1] Cobbles ___% [1] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [2] Clay ___% [2] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [2] Slight ___% [1] Mod. ___% [ ] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [1] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: Jervaulx (2)
Length: 500m
Scale used: A (delete as appropriate)

NGR: SE 164861
Date: 14/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides	1	1
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	3	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	2	1
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*	2	1
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris	1	1
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Myosotis scorpioides		2	1
Phalaris arundinacea		2	1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [1] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [2] >0.5-1 ___% [1] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [1] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [1]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [1] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: Jervaulx (2)
Length: 100 m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 164861
Date: 14/8/97
Surveyor: PS IDS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		1
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea			1
Myosotis scorpioides			1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [1] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [3] Pebbles ___% [3] Gravel ___% [2]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [1] Riffle ___% [ ] Run ___% [3]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [1]

Right Bank None ___% [3] Slight ___% [1] Mod. ___% [ ] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: d/s Kilgram Bridge intake(2b)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 191 860
Date: 13/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	2
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	5	4
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	4	4
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*	4	2
Ran. penic. subsp *penicillatus*	4	2
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae		1	1
Fissidens crassipes		3	3
Phalaris arundinacea		2	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [3] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [3] Cobbles ___% [2] Pebbles ___% [1] Gravel ___% [2]

Sand ___% [2] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [2] Riffle ___% [ ] Run ___% [3]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [1]

Water Clarity Clear ___% [3] Cloudy ___% [2] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [2]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: dls Kilgram Bridge intake (2b)
Length: 100 m
Scale used: C (delete as appropriate)

NGR: SE 191860
Date: 13/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		3
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		3
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		3
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		2
Ran. penic. subsp *penicillatus*		2
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiformis		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Fissidens crassipes			4
Phalaris arundinacea			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [2] >20 ___% [3]

Depth (m) <0.25 ___% [3] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [ ]

Substrate Bedrock ___% [ ] Boulders ___% [2] Cobbles ___% [2] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [2] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [1] Riffle ___% [1] Run ___% [3]

Shading: Left Bank None ___% [ ] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes		_____
Algae		_____
Others		_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ure
Site name: Clifton Castle (3)
Length: 500 m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 222831
Date: 14/8/97
Surveyor: DS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis	1	1
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	2	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	5	2
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides	4	2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum	1	1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*	2	1
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	2	1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Rorippa sylvestris		1	1
Phalaris arundinacea		2	1
Myosotis scorpioides		1	1
Filamentous algae		3	3
Fissidens crassipes		3	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [2] >20 ___% [3]

Depth (m) <0.25 ___% [2] 0.25-0.5 ___% [3] >0.5-1 ___% [2] >1.0 ___% [2]

Substrate Bedrock ___% [1] Boulders ___% [2] Cobbles ___% [3] Pebbles ___% [2] Gravel ___% [1]

Sand ___% [1] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [ ]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [1] Run ___% [2]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [1]

Right Bank None ___% [1] Slight ___% [ ] Mod. ___% [1] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: Clifton castle (3)
Length: 100 m
Scale used: ~~M~~ C (delete as appropriate)

NGR: SE 222831
Date: 14/8/97
Surveyor: DS IPS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		2
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		2
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		1
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		1
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Filamentous algae			3
Fissidens crassipes			2

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [1] 0.25-0.5 ___% [1] >0.5-1 ___% [2] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [2] Cobbles ___% [3] Pebbles ___% [1] Gravel ___% [1]

Sand ___% [ ] Silt/Mud ___% [ ] Clay ___% [ ] Peat ___% [ ] Not visible [1]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [3] Slight ___% [ ] Mod. ___% [ ] Dense ___% [ ]

Right Bank None ___% [ ] Slight ___% [ ] Mod. ___% [3] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [1] Stable ___% [ ] Unstble ___% [3] Soft ___% [ ]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____
_____
_____
_____
_____
_____
_____
_____

Macrophyte Survey Form

River: Ure
Site name: Aldwark (9)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 468629
Date: 13/8/97
Surveyor: DS/PS

	Rel	Cov		Rel	Cov		Rel	Cov
ALGAE			*Lotus pedunculatus*			*Lemna trisulca*		
Batrachospermum sp			*Menyanthes trifoliata*			*Phragmites australis*		
Hildenbrandia rivularis			*Montia fontana*			*Potamogeton alpinus*		
Lemanea fluviatillis			*Myriophyllum alterniflorum*			*Potamogeton berchtoldii*		
Vaucheria sp			*Myriophyllum spicatum*			*Potamogeton crispus*		
Enteromorpha sp			*Nuphar lutea*			*Potamogeton freisii*		
Stigeoclonium tenue			*Nymphaea alba*			*Potamogeton gramineus*		
Hydrodictyum reticulatum			*Nymphoides peltata*			*Potamogeton lucens*		
Cladophora agg.			*Oenanthe crocata*			*Potamogeton natans*		
LIVERWORTS			*Oenanthe fluviatilis*			*Potamogeton obtusifolius*		
Chiloscyphus polyanthos			*Polygonum amphibium*			*Potamogeton pectinatus*	5	3
Jungermania atrovirens			*Potentilla erecta*			*Potamogeton perfoliatus*		
Marsupella emarginata			*Ranunculus aquatilis*			*Potamogeton polygonifolius*		
Nardia compressa			*Ran. penic.* subsp *pseudofluitans*			*Potamogeton praelongus*		
Pellia endiviifolia			*Ran. penic.* subsp *penicillatus*			*Potamogeton pusillus*		
Pellia epiphylla			*Ran. penic.* subsp *vertumnus*			*Potamogeton trichoides*		
Scapania undulata			*Ranunculus circinatus*			*Sagittaria sagittifolia*		
MOSSES			*Ranunculus flammula*			*Schoenoplectus lacustris*	2	1
Amblystegium fluviatile			*Ranunculus fluitans*			*Sparganium emersum*		
Amblystegium riparium			*Ranunculus hederaceus*			*Sparganium erectum*	3	2
Blindia acuta			*Ranunculus omiophyllus*			*Spirodela polyrhiza*		
Brachythecium plumosum			*Ranunculus peltatus*			*Typha latifolia*		
Brachythecium rivulare			*Ranunculus trichophyllus*			*Typha angustifolia*		
Brachythecium rutabulum			*Ranunculus sceleratus*			*Zannichellia palustris*		
Bryum pseudotriquetrum			*Rorippa amphibia*					
Calliergon cuspidatum			*Rorippa nasturtium-aquaticum*			OTHER SPECIES / SAMPLE		
Cinclidotus fontinaloides			*Rumex hydrolopathum*			Phalaris arundinacea	3	2
Dichodontium flavescens			*Veronica anagallis-aquatica*			Filamentous algae	1	2
Dichodontium palustre			*Veronica catenata*					
Dicranella palustris			*Veronica scutellata*					
Fontinalis antipyretica			*Viola palustris*					
Fontinalis squamosa			MONOCOTYLEDONS					
Hygrohypnum luridum			*Acorus calamus*					
Hygrohypnum ochraceum			*Alisma plantago aquatica*					
Hyocomium armoricum			*Alisma lanceolatum*					
Philonotis fontana			*Bolboschoenus maritimus*					
Polytrichum commune			*Butomus umbellatus*	3	2			
Racomitrium aciculare			*Carex acuta*					
Rhynchostegium riparioides			*Carex acutiforms*					
Sphagnum species			*Carex riparia*					
Thamnobryum alopecurum			*Carex rostrata*					
VASCULAR CRYPTOGRAMS			*Carex vesicaria*					
Azolla filiculoides			*Catabrosa aquatica*					
Equisetum fluviatile			*Eleocharis palustris*					
Equisetum palustre			*Eleogiton fluitans*					
DICOTYLEDONS			*Elodea canadensis*					
Apium inundatum			*Elodea nuttallii*	3	2			
Apium nodiflorum			*Glyceria maxima*					
Berula erecta			*Groenlandia densa*					
Callitriche hamulata			*Hydrocharis morsus-ranae*					
Callitriche obtusangula			*Iris pseudacorus*					
Ceratophyllum demersum			*Juncus bulbosus*					
Hippurus vulgaris			*Lemna gibba*					
Littorella uniflora			*Lemna minor*					

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [2] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [1] Slight ___% [ ] Mod. ___% [1] Dense ___% [3]

Right Bank None ___% [1] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]
Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Graphed used for 100m

Macrophyte Survey Form

River: Ure
Site name: Aldwarke (9)
Length: 100 m
Scale used: C (delete as appropriate)

NGR: SE 468 629
Date: 13/8/97
Surveyor: PS/DS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		1
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea			2
Filamentous algae			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [ ] Silt/Mud ___% [2] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [ ] Slight ___% [1] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [ ] Slight ___% [3] Mod. ___% [ ] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

Grapnel used

Macrophyte Survey Form

River: Ouse
Site name: d/s Moor Monkton intake (1)
Length: 500m
Scale used: A ~~B~~ (delete as appropriate)

NGR: SE 536570
Date: 13/8/97
Surveyor: OS/PS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp	1	1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *verturnnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	3	1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor	1	1
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	5	4
Potamogeton perfoliatus	2	1
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Rorippa sylvestris		1	1
Phalaris arundinacea		3	2
Filamentous algae		1	2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [1] >0.5-1 ___% [ ] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [1] Silt/Mud ___% [1] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [2] Slight ___% [3] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [2] Slight ___% [3] Mod. ___% [1] Dense ___% [ ]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ouse
Site name: d/s Moor Monkton intake (1)
Length: 100 m
Scale used: ~~A~~C (delete as appropriate)

NGR: SE 536570
Date: 13/8/97
Surveyor: PS IDS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		1
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		1
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Phalaris arundinacea			1
Filamentous algae			2

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% ☐ 1-5 ___% ☐ >5-10 ___% ☐ >10-20 ___% ☐ >20 ___% [3]

Depth (m) <0.25 ___% ☐ 0.25-0.5 ___% [1] >0.5-1 ___% ☐ >1.0 ___% [3]

Substrate Bedrock ___% ☐ Boulders ___% ☐ Cobbles ___% ☐ Pebbles ___% ☐ Gravel ___% ☐

Sand ___% [1] Silt/Mud ___% [1] Clay ___% ☐ Peat ___% ☐ Not visible [3]

Habitat Pool ___% ☐ Slack ___% [3] Riffle ___% ☐ Run ___% ☐

Shading: Left Bank None ___% ☐ Slight ___% ☐ Mod. ___% ☐ Dense ___% [3]

Right Bank None ___% [3] Slight ___% ☐ Mod. ___% [1] Dense ___% ☐

Water Clarity Clear ___% [3] Cloudy ___% ☐ Turbi ___% ☐

Bed Stability Firm ___% ☐ Stable ___% ☐ Unstble ___% ☐ Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Sites _____ **Comparability** ☐

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) ☐

Physical impact of STW discharge (1-5, minor to major, + comment) ☐ _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	☐	_____
Algae	☐	_____
Others	☐	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ouse
Site name: at Beningbrough Hall (2)
Length: 500m
Scale used: A / B (delete as appropriate)

NGR: SE 521581
Date: 13/8/97
Surveyor: PS/DS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica	1	1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyócomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		

	Rel	Cov
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus	4	3
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii	1	1
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		

	Rel	Cov
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus	5	4
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum	1	1
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE	Rel	Cov
Phalaris arundinacea		2	2
Rorippa sylvestris		1	1
filamentous algae		1	1
Octodiceras fontanum		1	1

%	C	A
<0.1%	1	1
0.1-1%	2	2
1-2.5%	3	3
2.5-5%	4	3
5-10%	5	4
10-25%	6	5
25-50%	7	5
50-75%	8	5
>75%	9	5

Area

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [2] Silt/Mud ___% [2] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [2] Slight ___% [2] Mod. ___% [ ] Dense ___% [2]

Right Bank None ___% [1] Slight ___% [2] Mod. ___% [1] Dense ___% [2]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

_____

_____

Macrophyte Survey Form

River: Ouse
Site name: at Beningbrough Hall (2)
Length: 100m
Scale used: ~~A~~ C (delete as appropriate)

NGR: SE 521581
Date: 13/8/17
Surveyor: PS IDS

	Rel	Cov
ALGAE		
Batrachospermum sp		
Hildenbrandia rivularis		
Lemanea fluviatillis		
Vaucheria sp		
Enteromorpha sp		
Stigeoclonium tenue		
Hydrodictyum reticulatum		
Cladophora agg.		
LIVERWORTS		
Chiloscyphus polyanthos		
Jungermania atrovirens		
Marsupella emarginata		
Nardia compressa		
Pellia endiviifolia		
Pellia epiphylla		
Scapania undulata		
MOSSES		
Amblystegium fluviatile		
Amblystegium riparium		
Blindia acuta		
Brachythecium plumosum		
Brachythecium rivulare		
Brachythecium rutabulum		
Bryum pseudotriquetrum		
Calliergon cuspidatum		
Cinclidotus fontinaloides		
Dichodontium flavescens		
Dichodontium palustre		
Dicranella palustris		
Fontinalis antipyretica		1
Fontinalis squamosa		
Hygrohypnum luridum		
Hygrohypnum ochraceum		
Hyocomium armoricum		
Philonotis fontana		
Polytrichum commune		
Racomitrium aciculare		
Rhynchostegium riparioides		
Sphagnum species		
Thamnobryum alopecurum		
VASCULAR CRYPTOGRAMS		
Azolla filiculoides		
Equisetum fluviatile		
Equisetum palustre		
DICOTYLEDONS		
Apium inundatum		
Apium nodiflorum		
Berula erecta		
Callitriche hamulata		
Callitriche obtusangula		
Ceratophyllum demersum		
Hippurus vulgaris		
Littorella uniflora		
Lotus pedunculatus		
Menyanthes trifoliata		
Montia fontana		
Myriophyllum alterniflorum		
Myriophyllum spicatum		
Nuphar lutea		
Nymphaea alba		
Nymphoides peltata		
Oenanthe crocata		
Oenanthe fluviatilis		
Polygonum amphibium		
Potentilla erecta		
Ranunculus aquatilis		
Ran. penic. subsp *pseudofluitans*		
Ran. penic. subsp *penicillatus*		
Ran. penic. subsp *vertumnus*		
Ranunculus circinatus		
Ranunculus flammula		
Ranunculus fluitans		
Ranunculus hederaceus		
Ranunculus omiophyllus		
Ranunculus peltatus		
Ranunculus trichophyllus		
Ranunculus sceleratus		
Rorippa amphibia		
Rorippa nasturtium-aquaticum		
Rumex hydrolopathum		
Veronica anagallis-aquatica		
Veronica catenata		
Veronica scutellata		
Viola palustris		
MONOCOTYLEDONS		
Acorus calamus		
Alisma plantago aquatica		
Alisma lanceolatum		
Bolboschoenus maritimus		
Butomus umbellatus		2
Carex acuta		
Carex acutiforms		
Carex riparia		
Carex rostrata		
Carex vesicaria		
Catabrosa aquatica		
Eleocharis palustris		
Eleogiton fluitans		
Elodea canadensis		
Elodea nuttallii		
Glyceria maxima		
Groenlandia densa		
Hydrocharis morsus-ranae		
Iris pseudacorus		
Juncus bulbosus		
Lemna gibba		
Lemna minor		
Lemna trisulca		
Phragmites australis		
Potamogeton alpinus		
Potamogeton berchtoldii		
Potamogeton crispus		
Potamogeton freisii		
Potamogeton gramineus		
Potamogeton lucens		
Potamogeton natans		
Potamogeton obtusifolius		
Potamogeton pectinatus		
Potamogeton perfoliatus		
Potamogeton polygonifolius		
Potamogeton praelongus		
Potamogeton pusillus		
Potamogeton trichoides		
Sagittaria sagittifolia		
Schoenoplectus lacustris		
Sparganium emersum		
Sparganium erectum		
Spirodela polyrhiza		
Typha latifolia		
Typha angustifolia		
Zannichellia palustris		

OTHER SPECIES	SAMPLE		
Rorippa sylvestris			1
Phalaris arundinacea			1
Filamentous algae			1
Octodiceras fontanum			1

%	C	A	Area
<0.1%	1	1	
0.1-1%	2	2	
1-2.5%	3	3	
2.5-5%	4	3	
5-10%	5	4	
10-25%	6	5	
25-50%	7	5	
50-75%	8	5	
>75%	9	5	

Physical Records River: NGR:

(Use 3 point scale, 1 = <5%, 2 = 5-25% and 3 = >25%)

Width (m) <1 ___% [ ] 1-5 ___% [ ] >5-10 ___% [ ] >10-20 ___% [ ] >20 ___% [3]

Depth (m) <0.25 ___% [ ] 0.25-0.5 ___% [ ] >0.5-1 ___% [1] >1.0 ___% [3]

Substrate Bedrock ___% [ ] Boulders ___% [ ] Cobbles ___% [ ] Pebbles ___% [ ] Gravel ___% [ ]

Sand ___% [2] Silt/Mud ___% [2] Clay ___% [ ] Peat ___% [ ] Not visible [3]

Habitat Pool ___% [ ] Slack ___% [3] Riffle ___% [ ] Run ___% [ ]

Shading: Left Bank None ___% [1] Slight ___% [ ] Mod. ___% [ ] Dense ___% [3]

Right Bank None ___% [2] Slight ___% [1] Mod. ___% [ ] Dense ___% [3]

Water Clarity Clear ___% [3] Cloudy ___% [ ] Turbi ___% [ ]

Bed Stability Firm ___% [ ] Stable ___% [ ] Unstble ___% [ ] Soft ___% [3]

Measure of confidence for comparability of u/s and d/s sites (I > 75% similar, II 50-75%, III <50%)

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Sites _____ **Comparability** [ ]

Confidence in survey conditions (% of site affected by adverse survey conditions, A < 25%, B 25-50%, C >50%) [ ]

Physical impact of STW discharge (1-5, minor to major, + comment) [ ] _____

Plant samples

	No. of samples	Sample codes used (e.g. a-d, 1-4)
Bryophytes	[ ]	_____
Algae	[ ]	_____
Others	[ ]	_____

Comments (including observations on plant condition, algal and epiphyte growth)

_____

_____

_____

_____

_____

_____

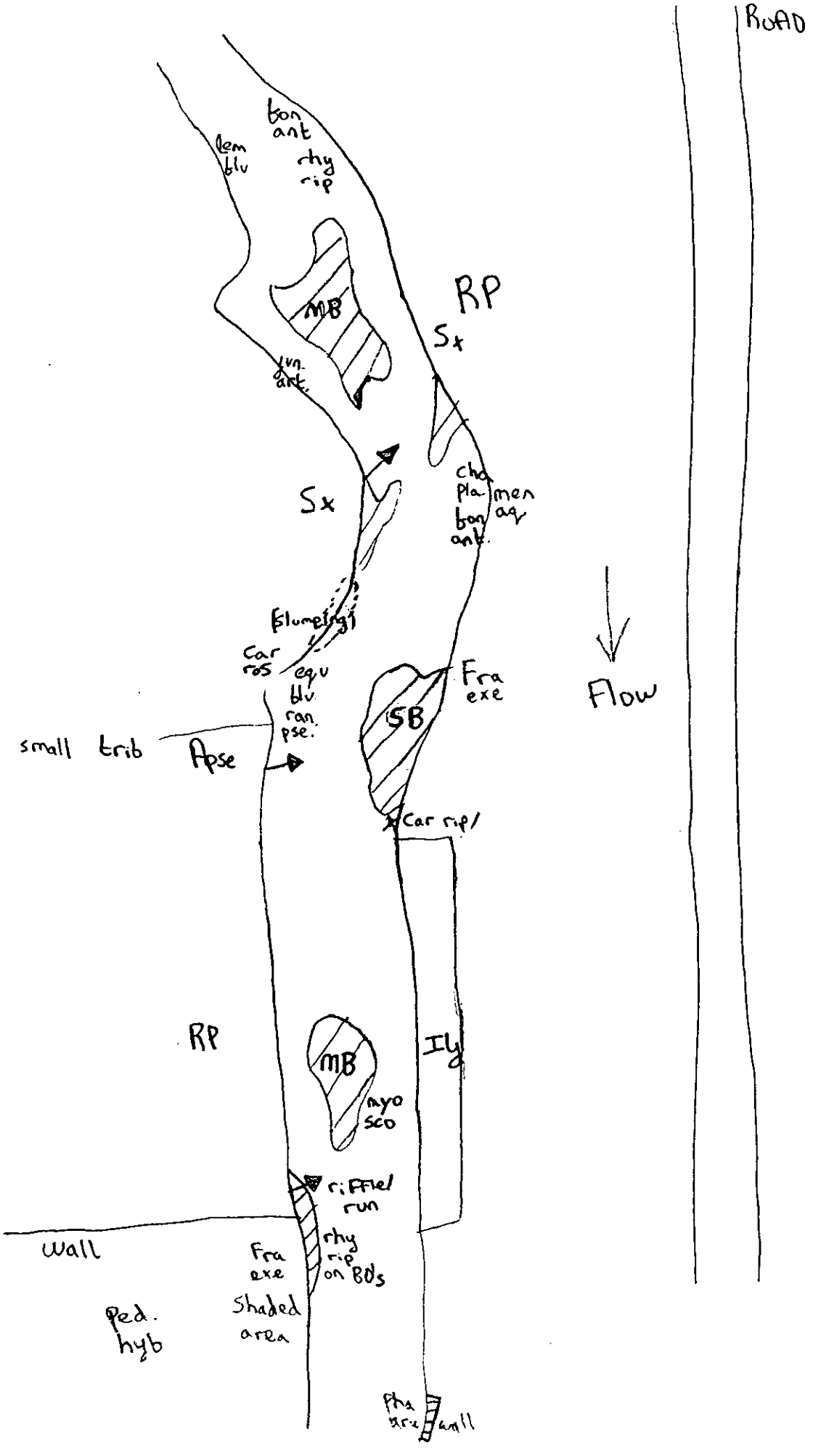
_____

_____

Appendix II. Sketch maps.

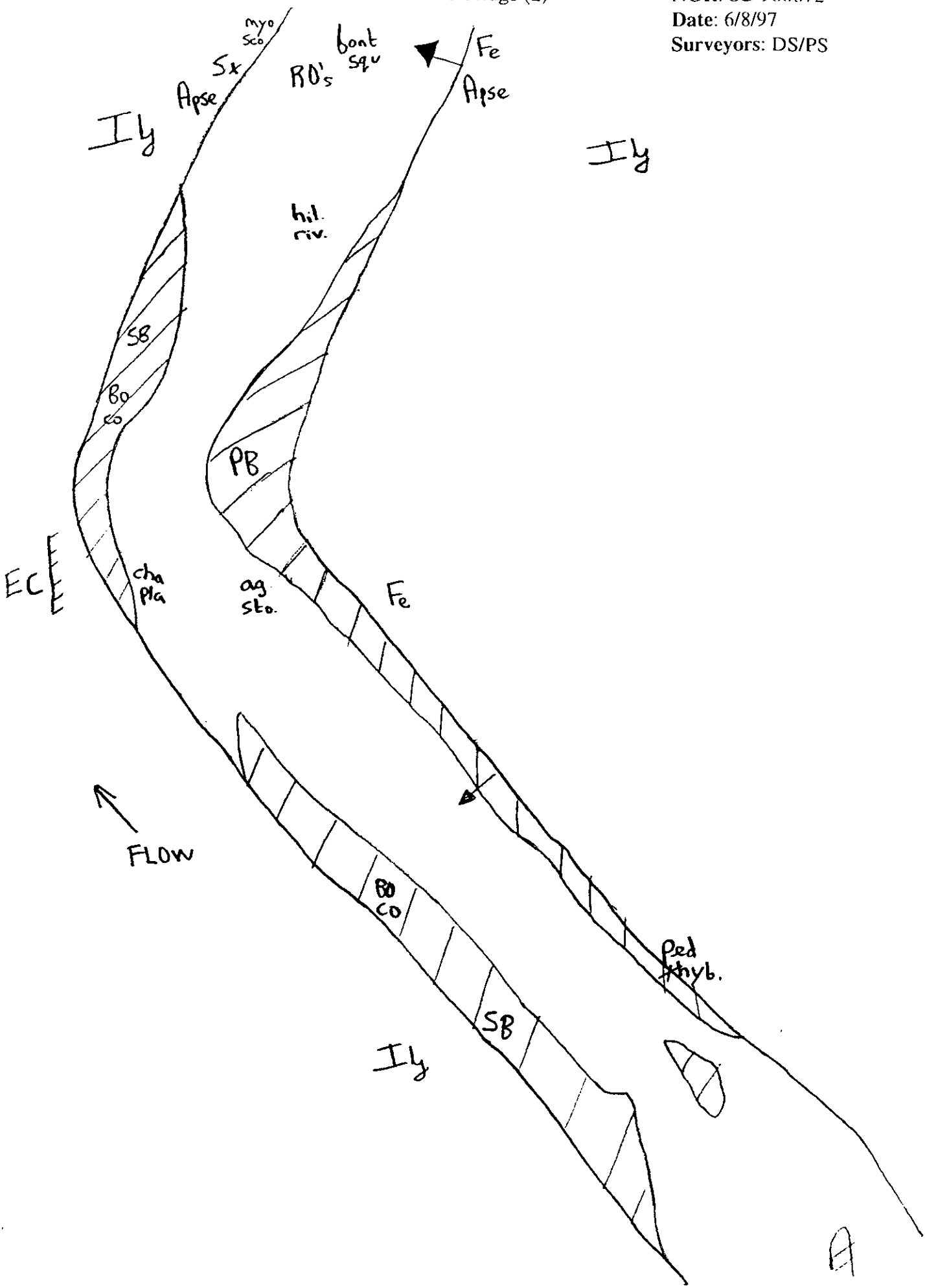
River: Wharfe **Site**: u/s Starbotton (1)

NGR: SD 946756
Date: 6/8/97
Surveyors: DS/PS

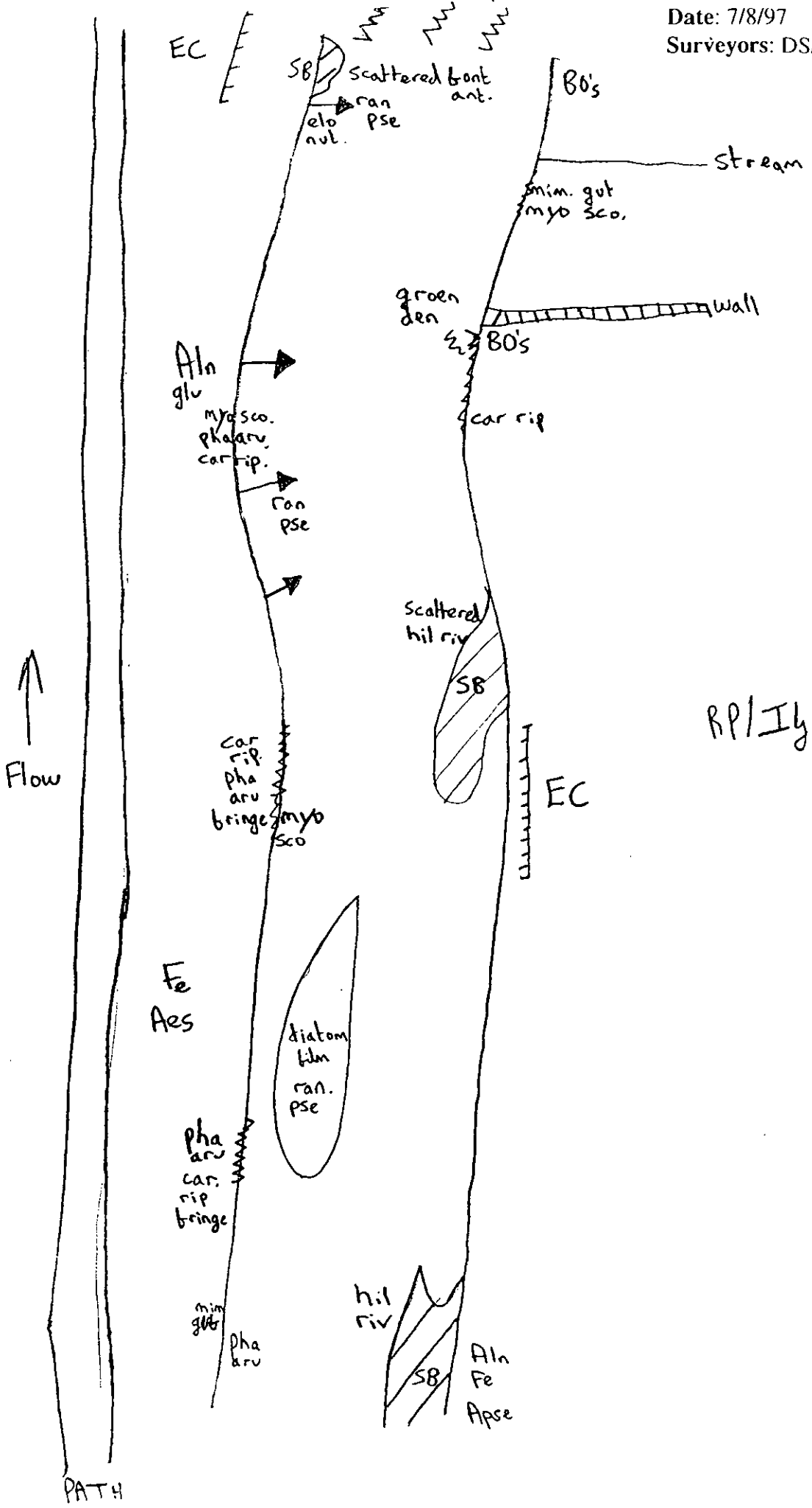


River: Wharfe **Site**: d/s Conistone Bridge (2)

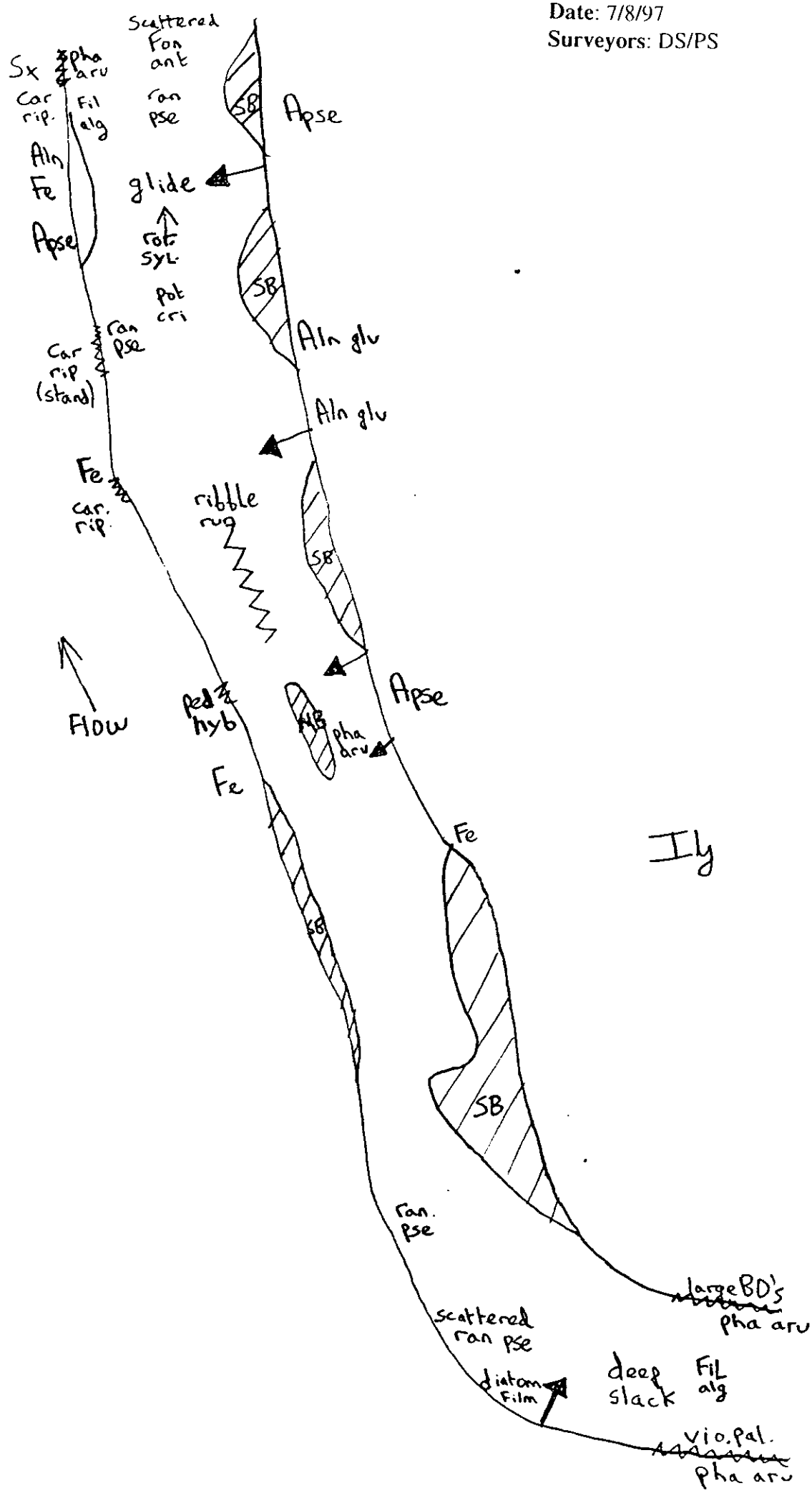
NGR: SD 980672
Date: 6/8/97
Surveyors: DS/PS



River: Wharfe **Site**: u/s Hebden (3) Riffle **NGR**: SE 015626
Date: 7/8/97
Surveyors: DS/PS

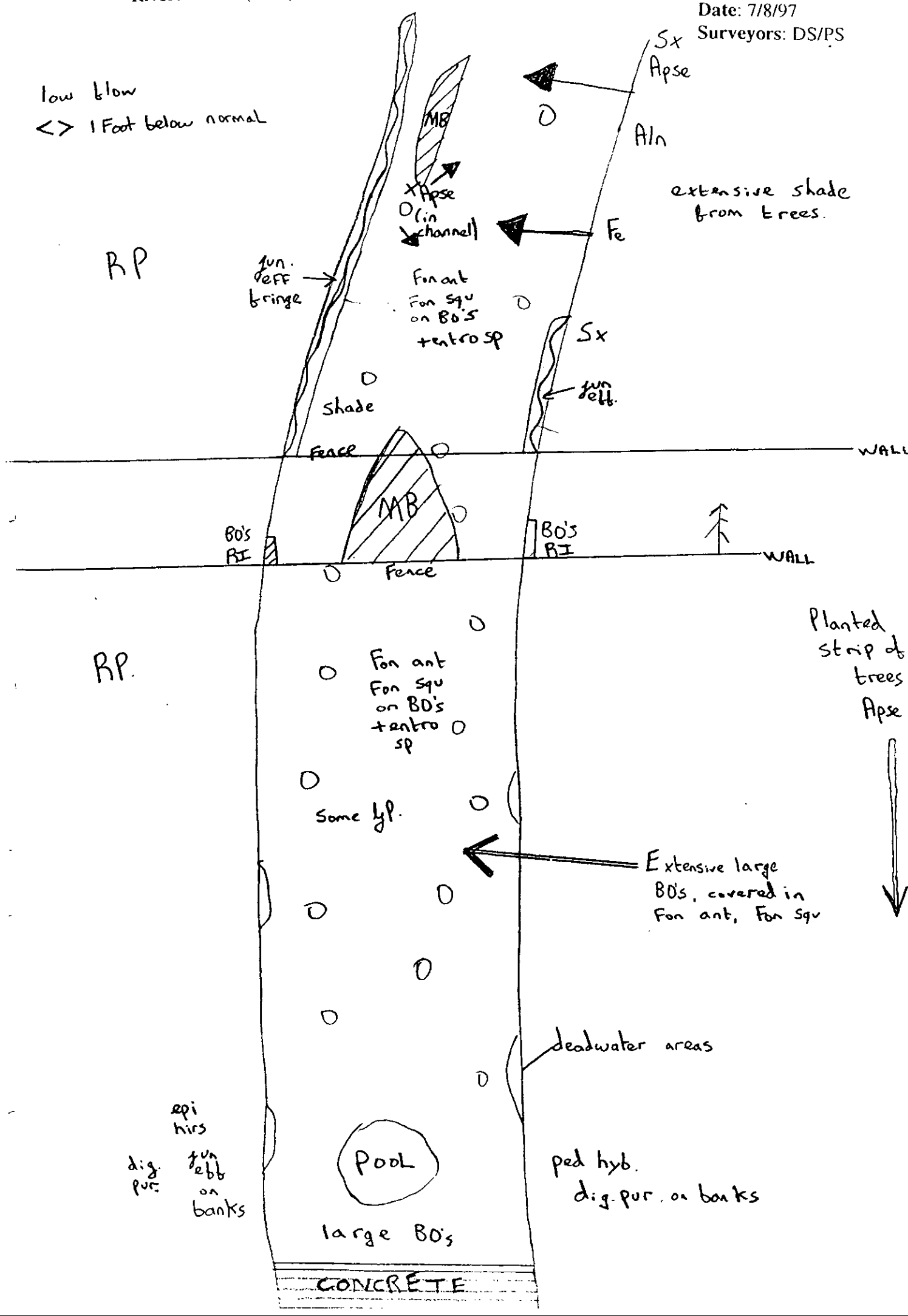


River: Wharfe Site: Appletreewick (4) NGR: SE 0426 02
Date: 7/8/97
Surveyors: DS/PS



River: Wharfe (Dibb) **Site**: u/s Dibbles Bridge (5)

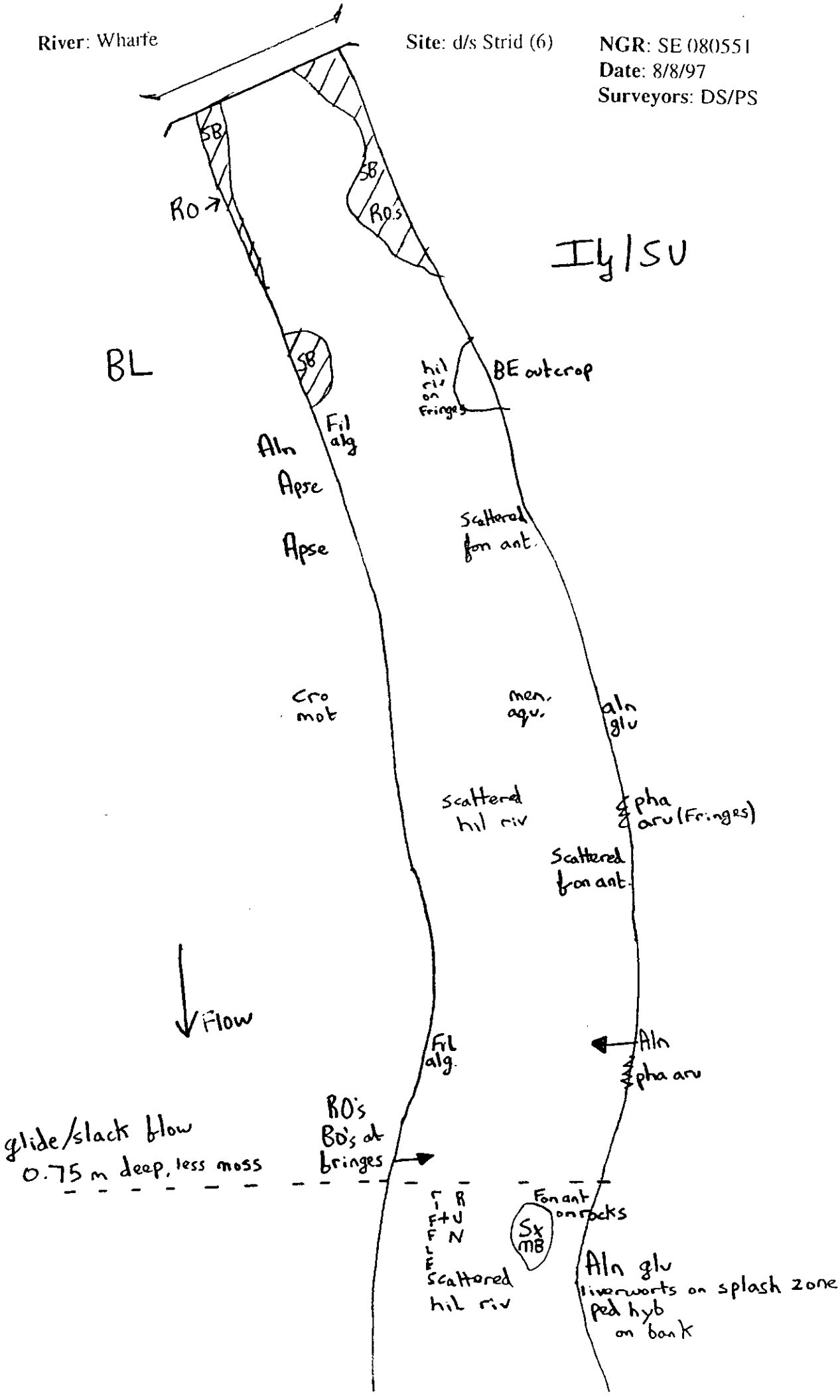
NGR: SE 054637
Date: 7/8/97
Surveyors: DS/PS



River: Wharfe

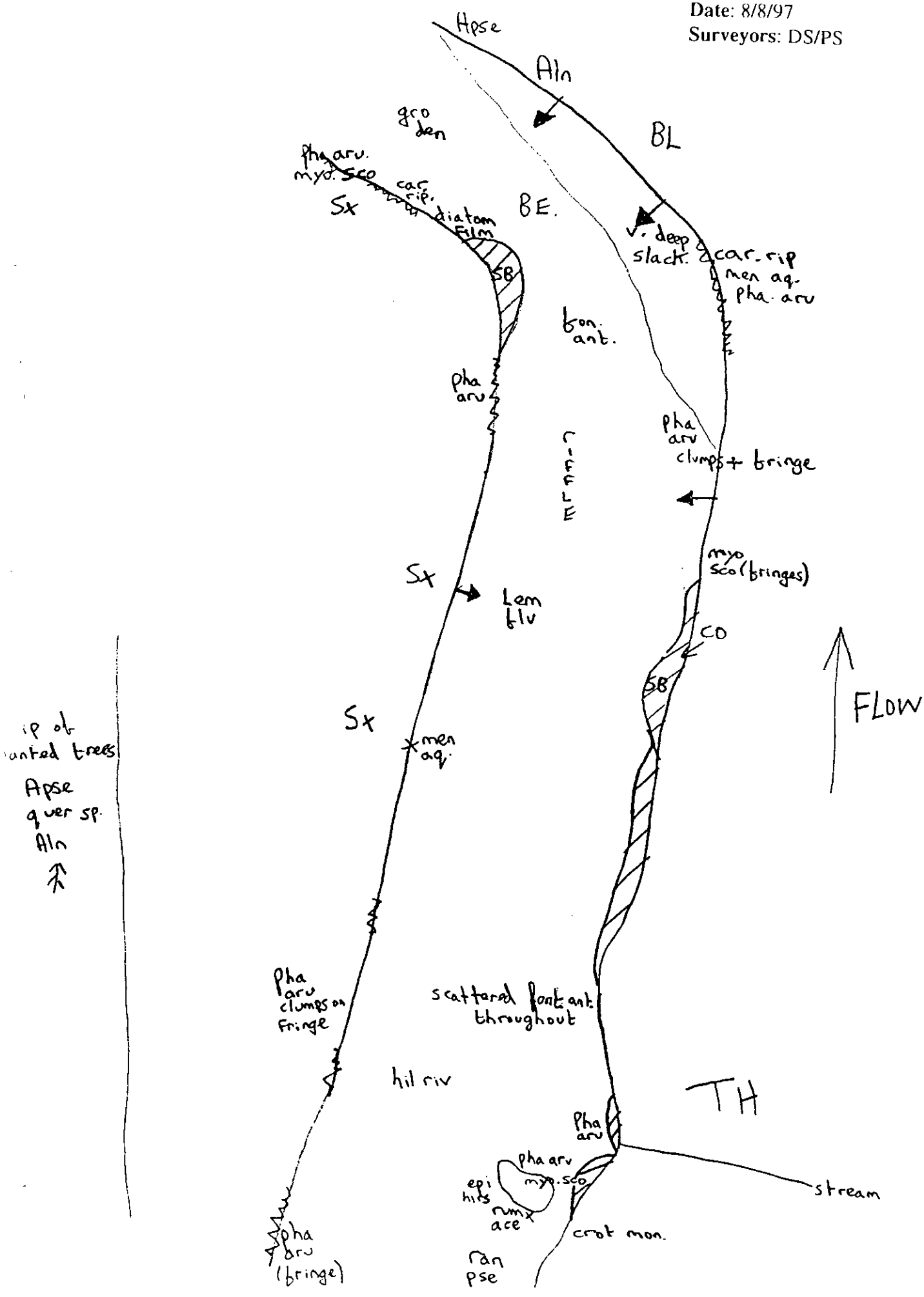
Site: d/s Strid (6)

NGR: SE 080551
Date: 8/8/97
Surveyors: DS/PS



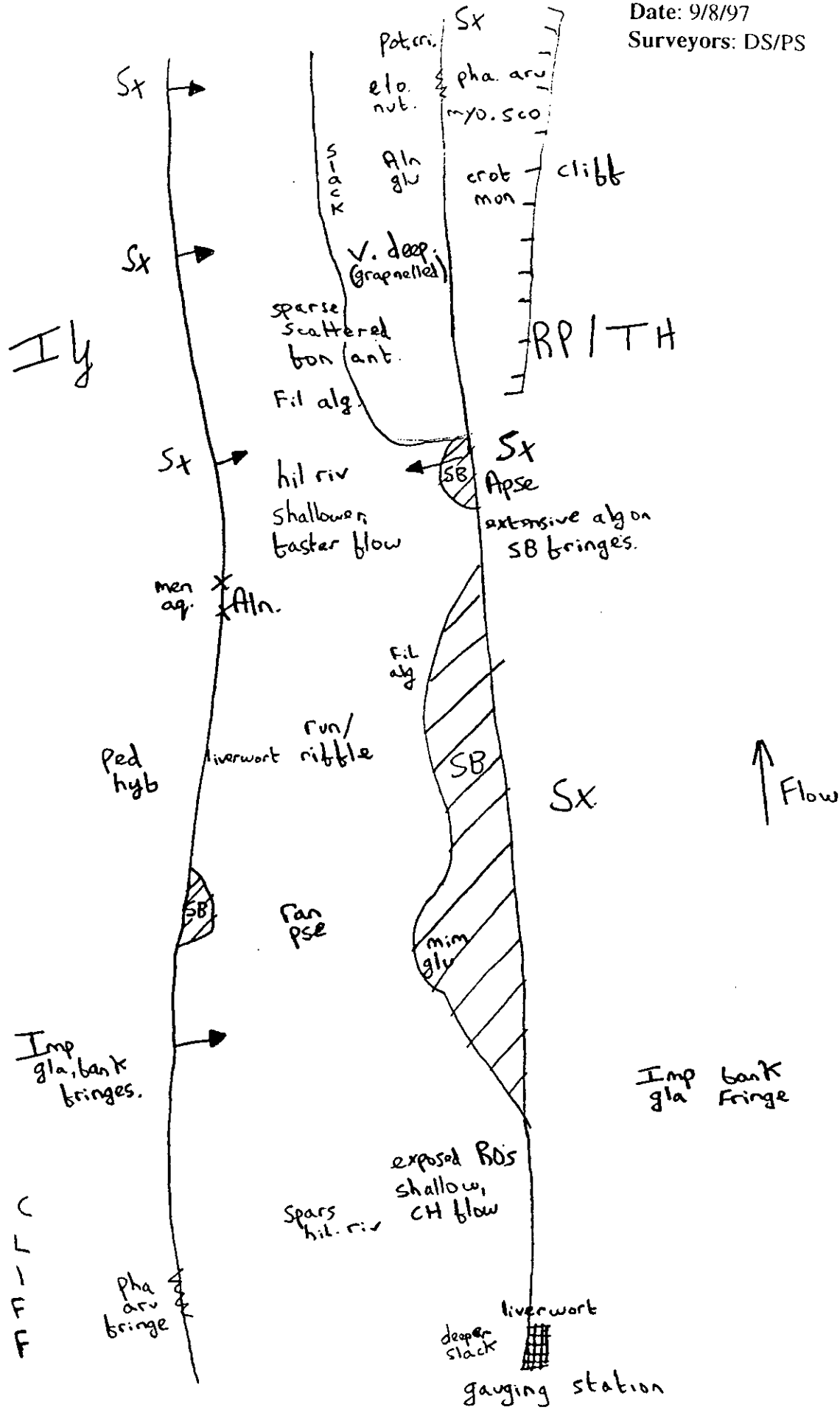
River: Wharfe **Site**: u/s Lobwood (7)

NGR: SE 072523
Date: 8/8/97
Surveyors: DS/PS



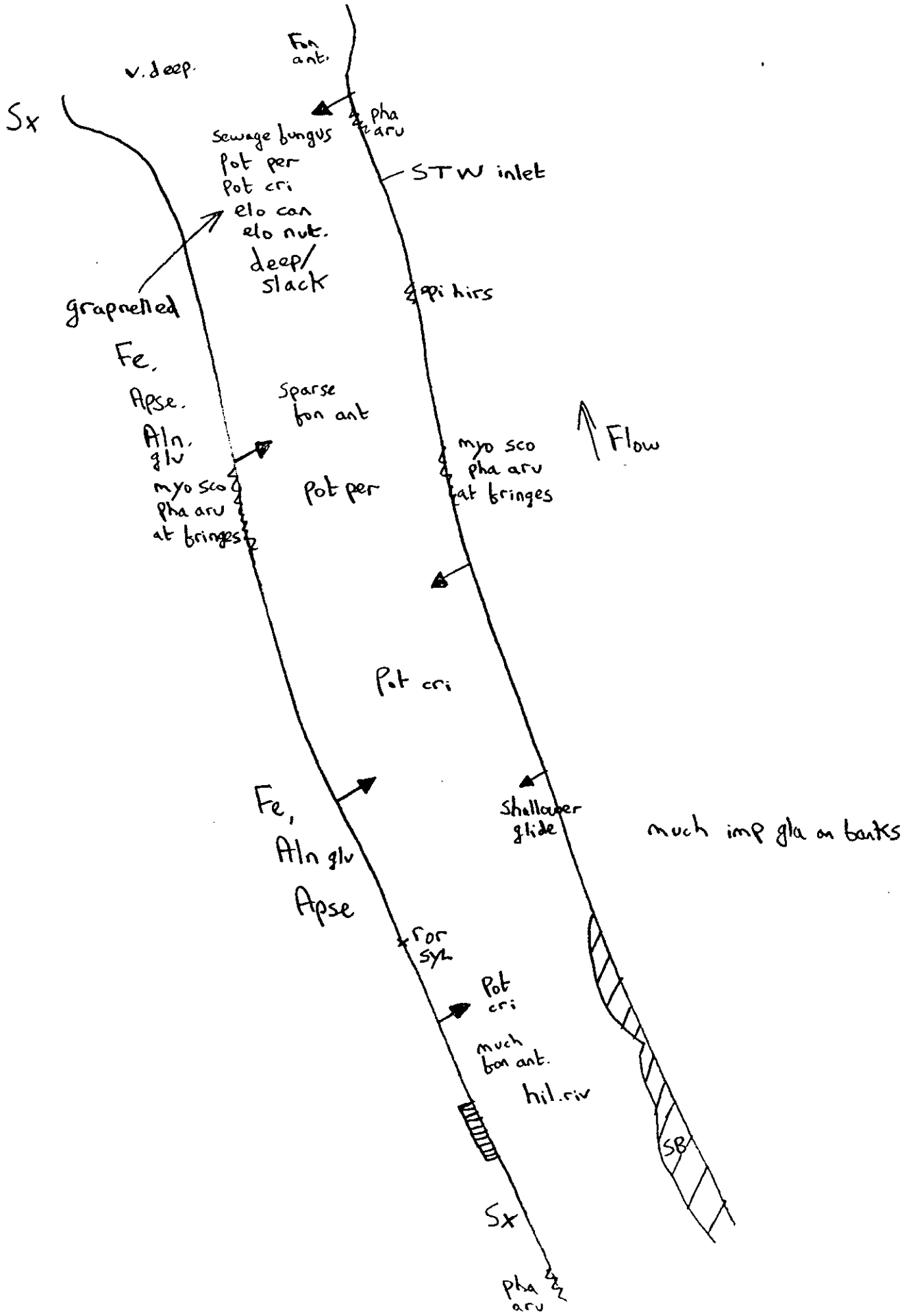
A59

River: Wharfe **Site**: Addingham (d/s weir, 8) **NGR**: SE 091489
Date: 9/8/97
Surveyors: DS/PS



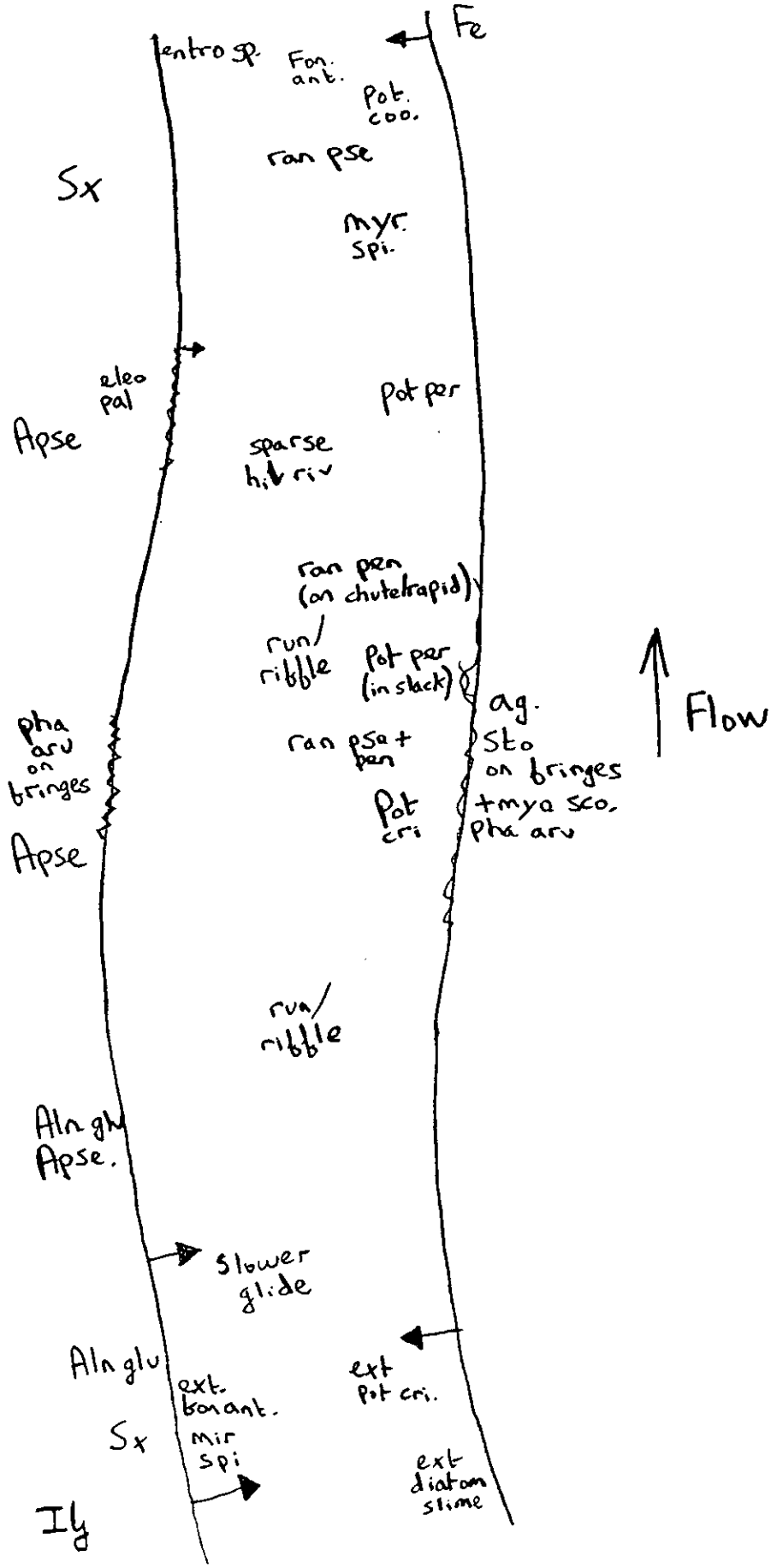
River: Wharfe Site: Ilkley (9)

NGR: SE 124484
Date: 10/8/97
Surveyors: DS/PS



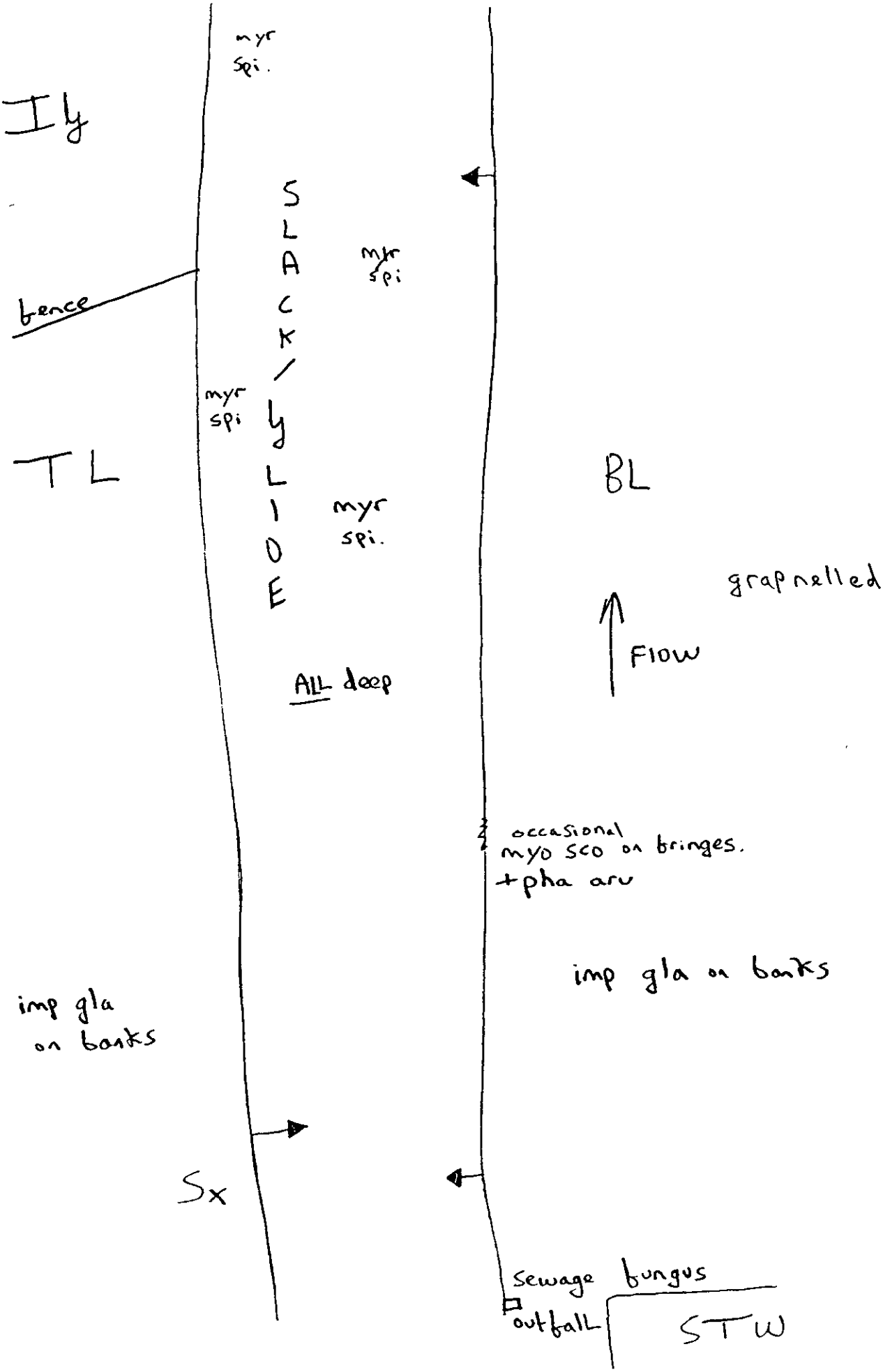
River: Wharfe **Site**: d/s Burley (10)

NGR: SE 175463
Date: 10/8/97
Surveyors: DS/PS

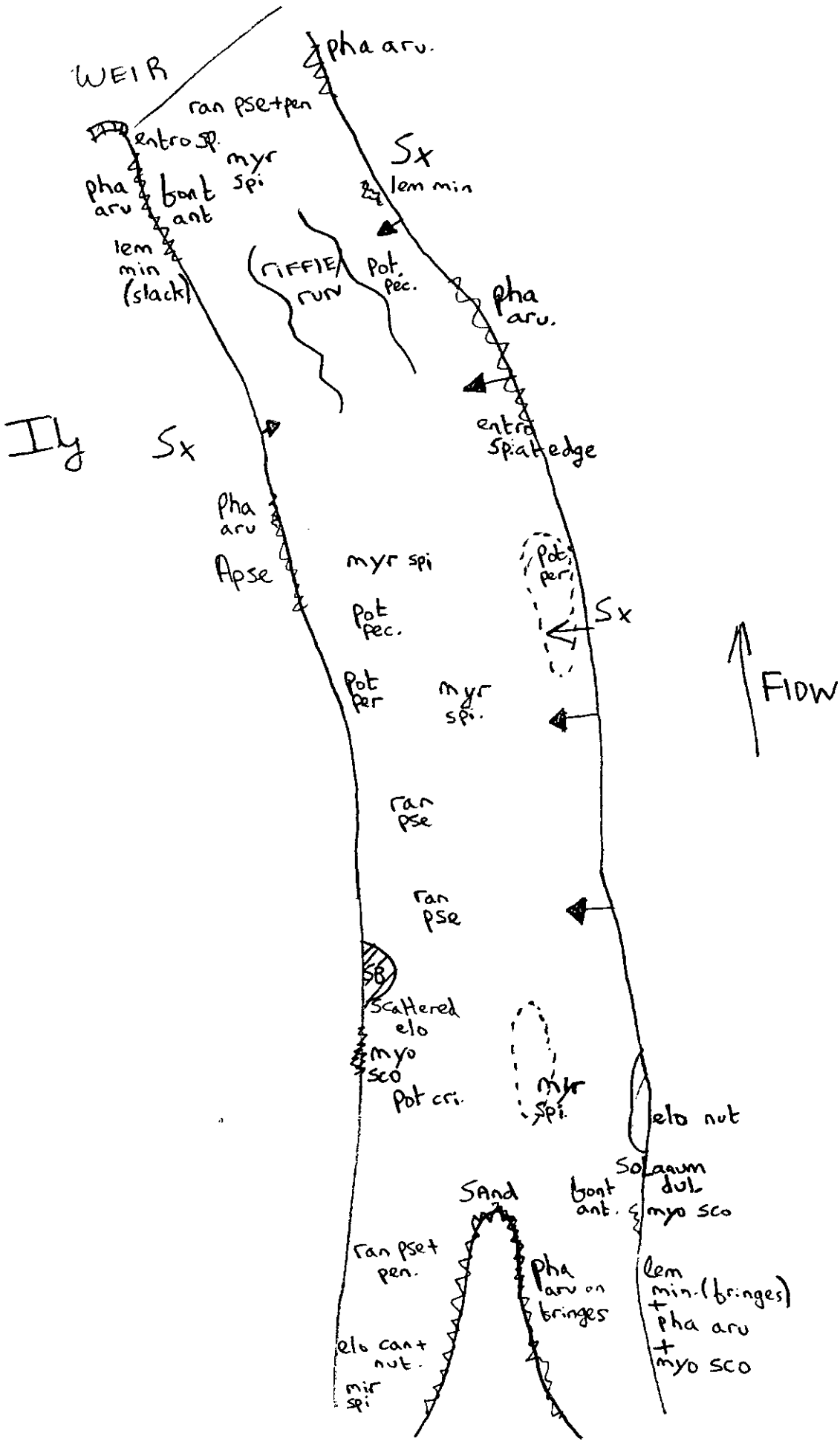


River: Wharfe **Site**: Knotford (11)

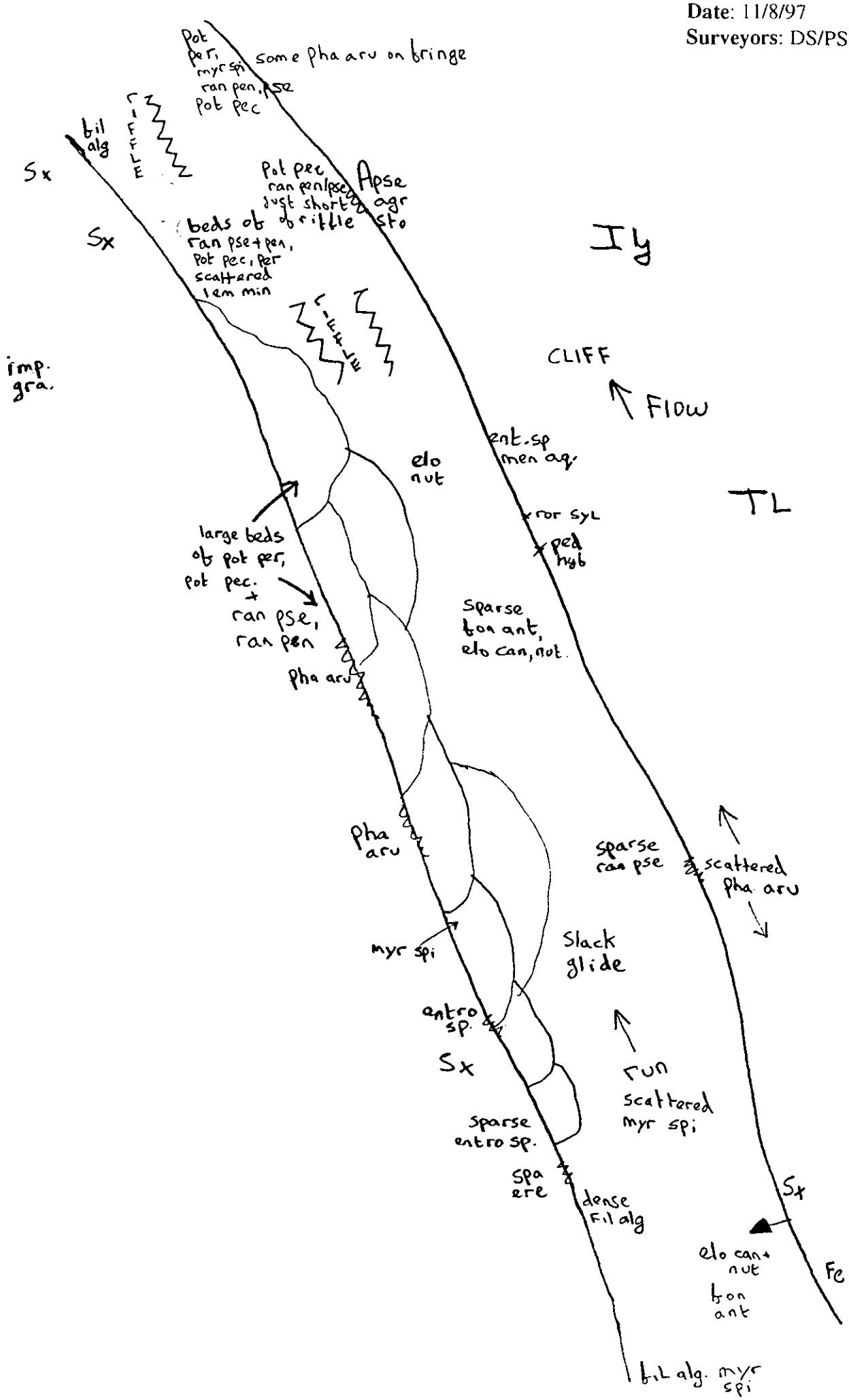
NGR: SE 223463
Date: 10/8/97
Surveyors: DS/PS



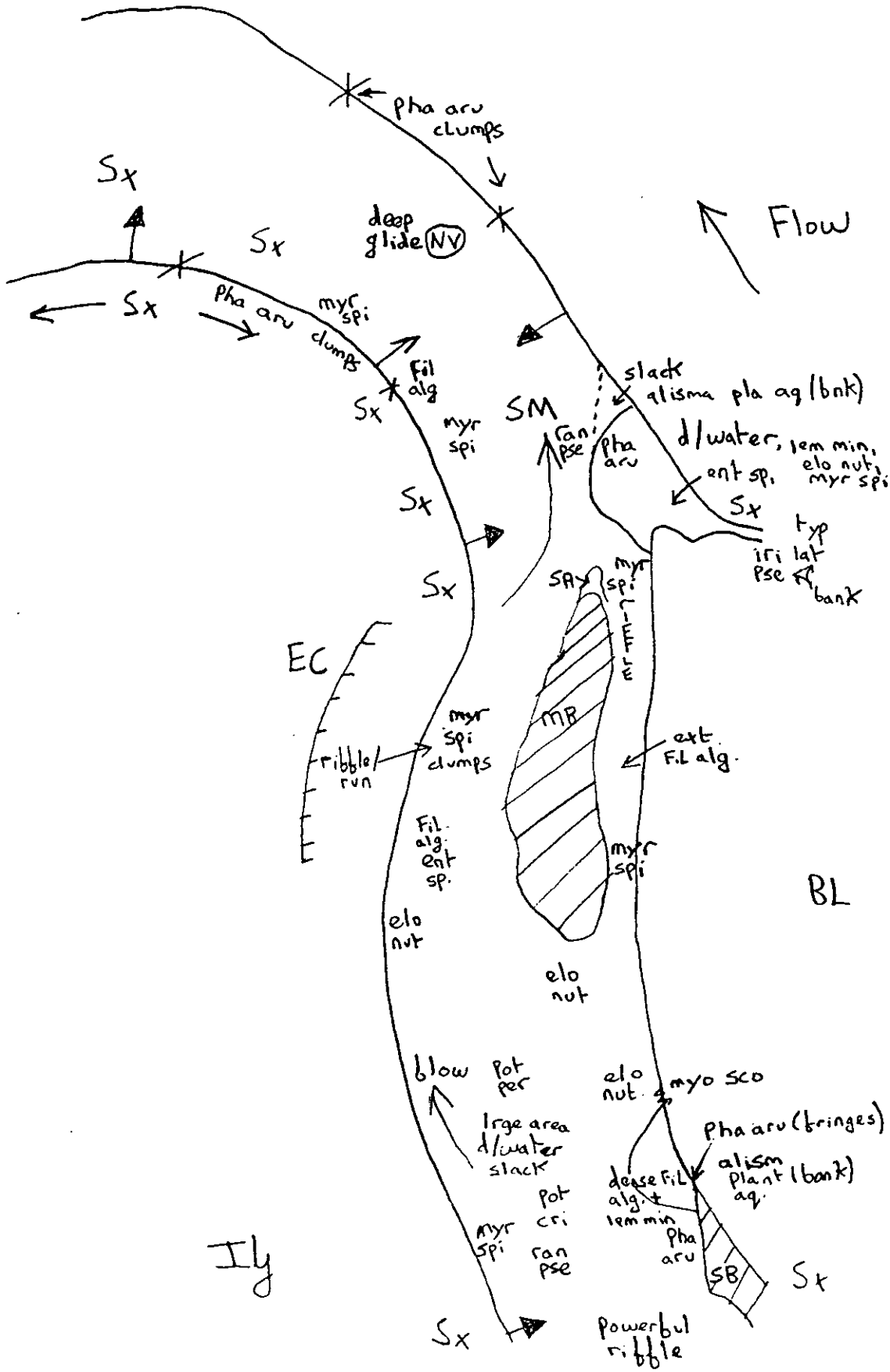
River: Wharfe **Site**: u/s Riffa Beck (12) **NGR**: SE 255456
Date: 11/8/97
Surveyors: DS/PS



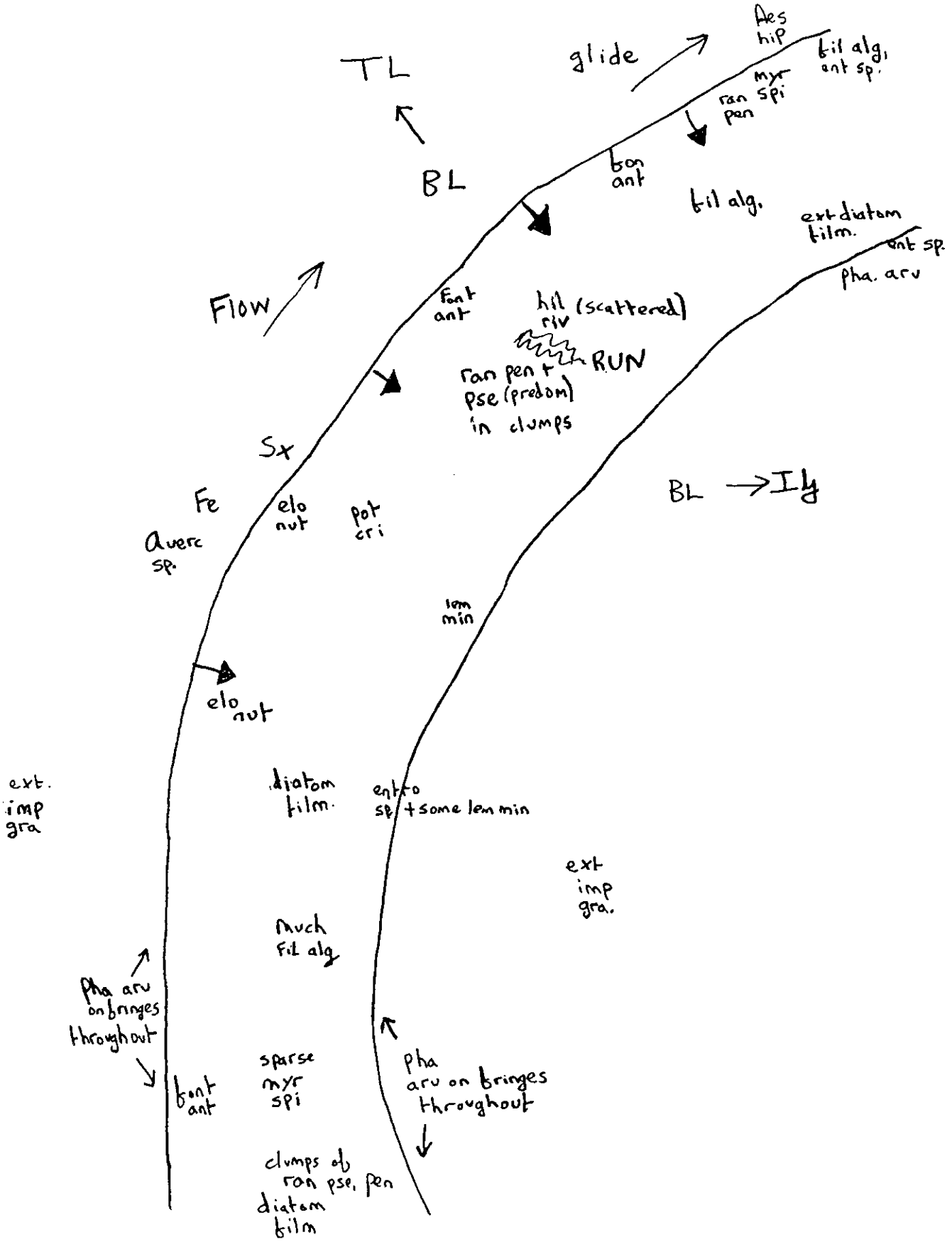
River: Wharfe Site: The Nunnery (13) NGR: SE 288455
Date: 11/8/97
Surveyors: DS/PS



River: Wharfe **Site**: u/s Collingham (14) **NGR**: SE 354457
Date: 11/8/97
Surveyors: DS/PS

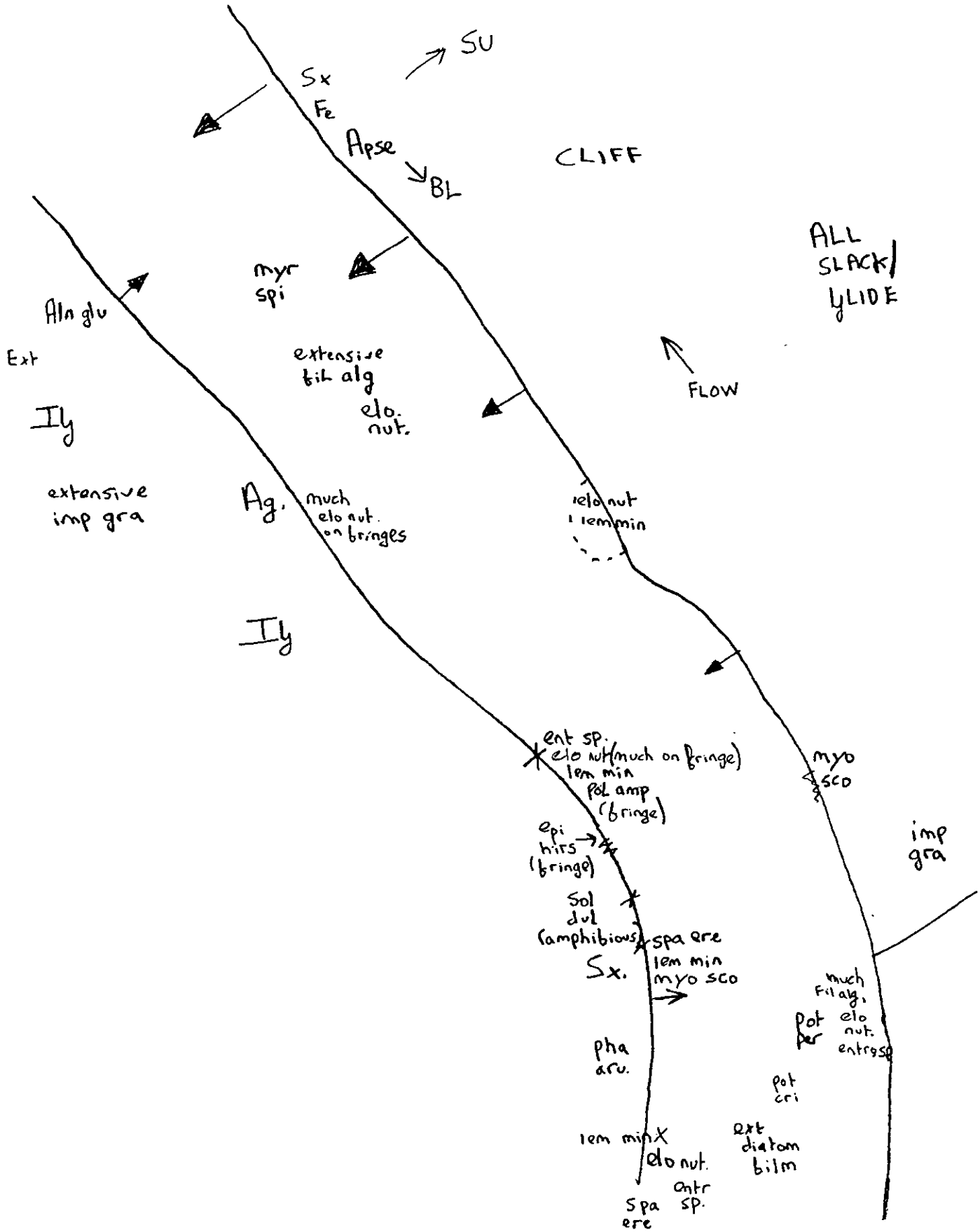


River: Wharfe **Site**: u/s Woodhall Hotel (16) **NGR**: SE 369467
Date: 7/8/97
Surveyors: DS/PS

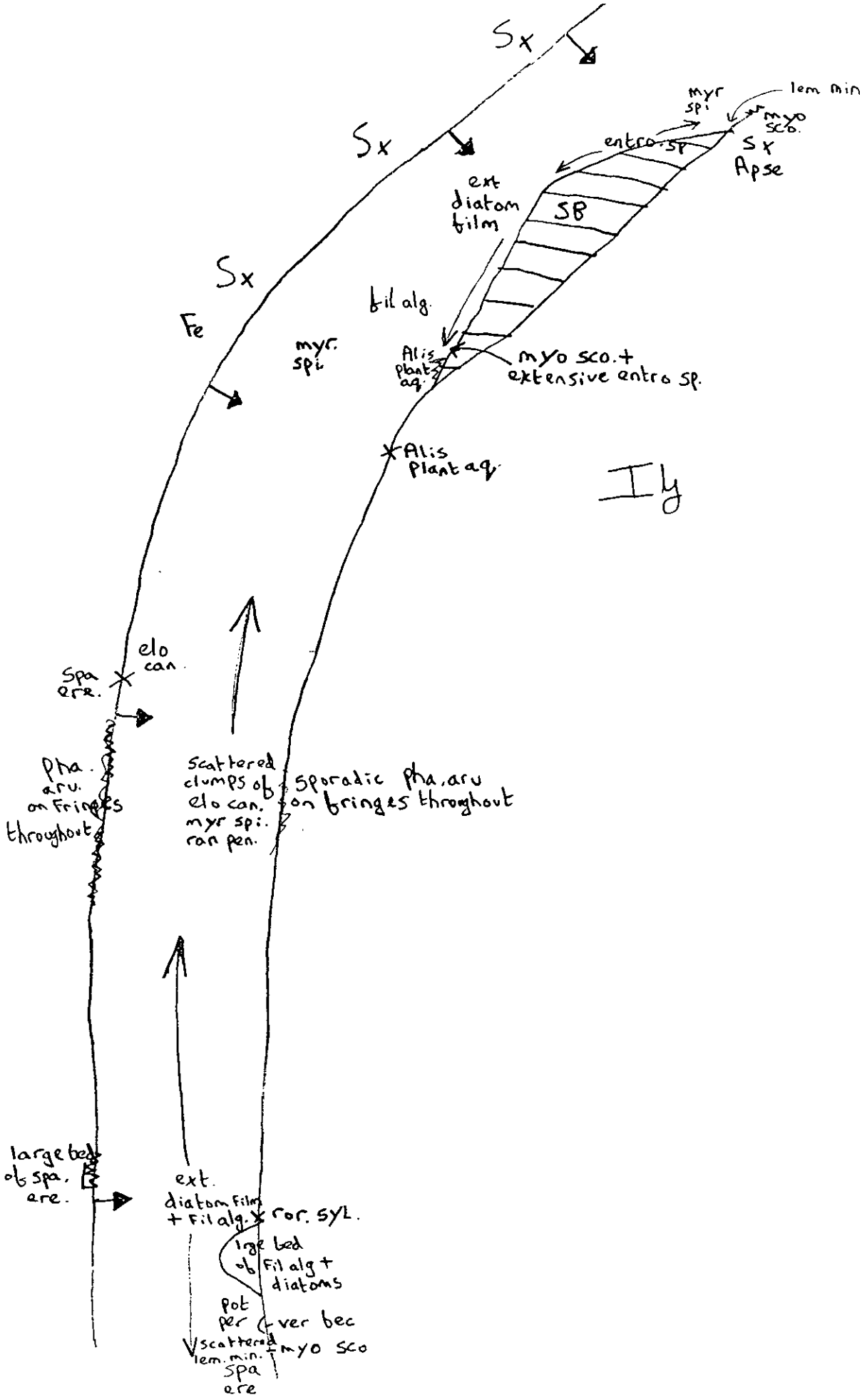


River: Wharfe **Site**: Boston Spa (15)

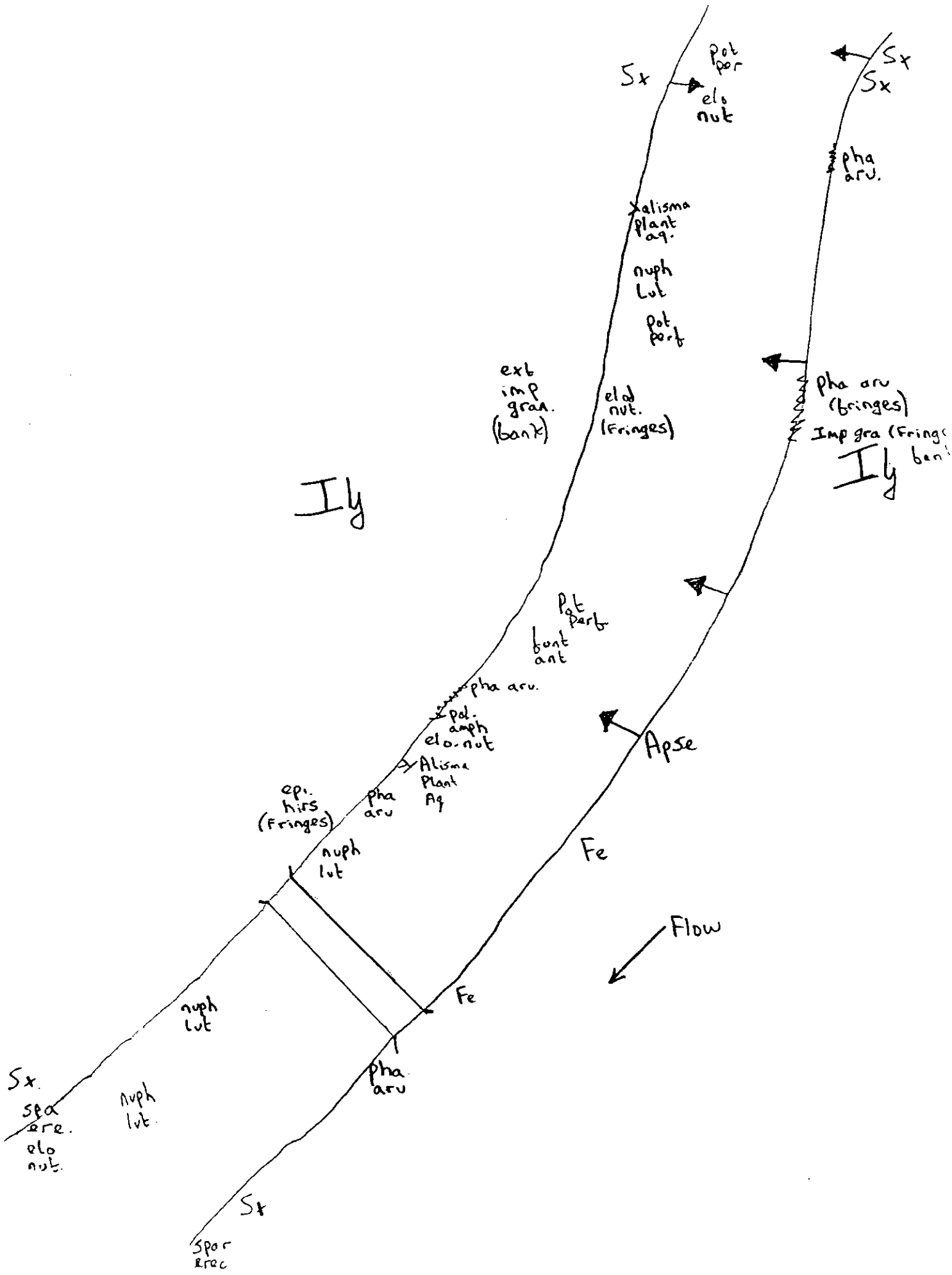
NGR: SE 423465
Date: 12/8/97
Surveyors: DS/PS



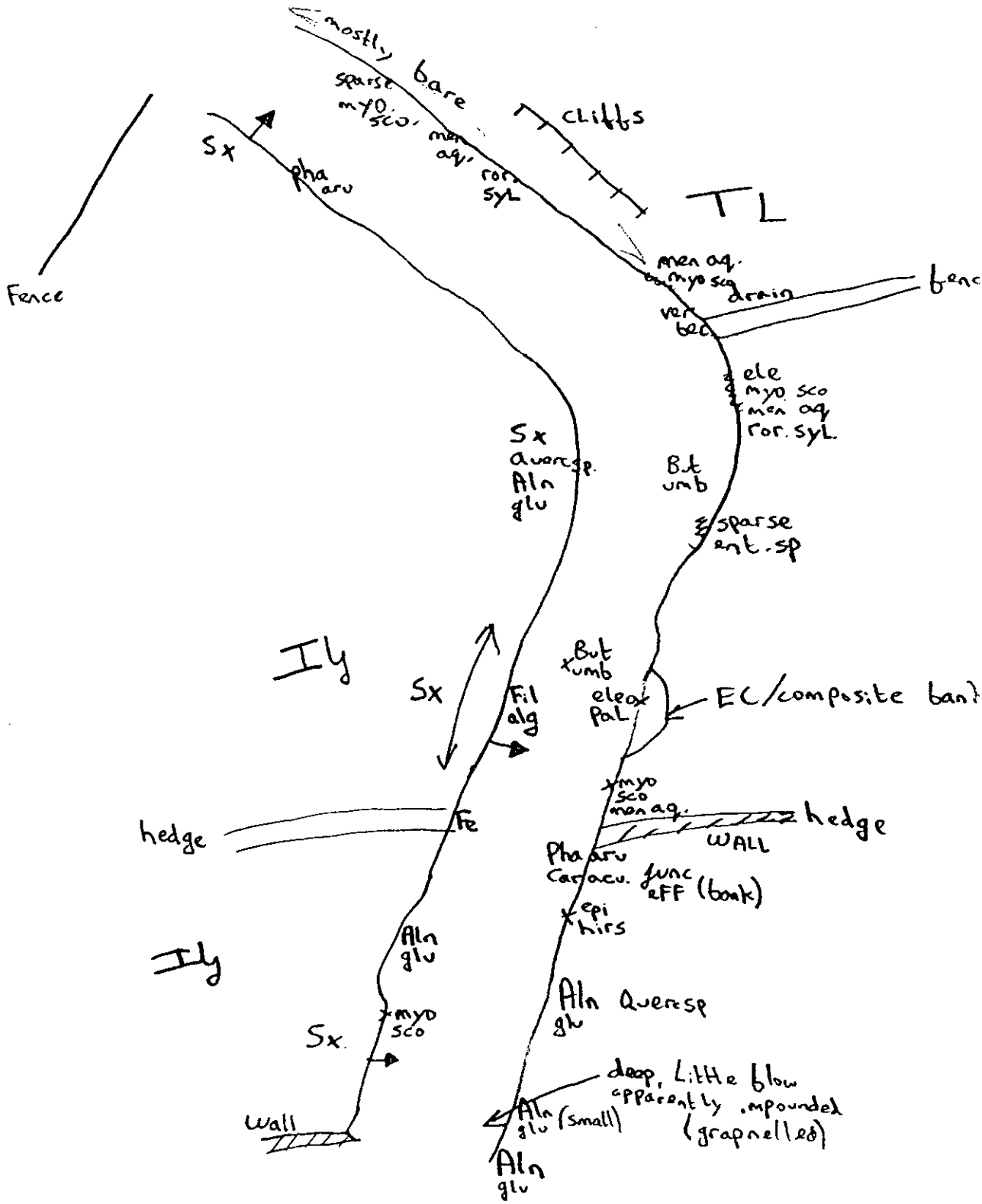
River: Wharfe **Site**: u/s Newton Kyme (17) **NGR**: SE 455457
Date: 12/8/97
Surveyors: DS/PS



River: Wharfe **Site**: u/s Tadcaster Weir (18) **NGR**: SE 485439
Date: 12/8/97
Surveyors: DS/PS

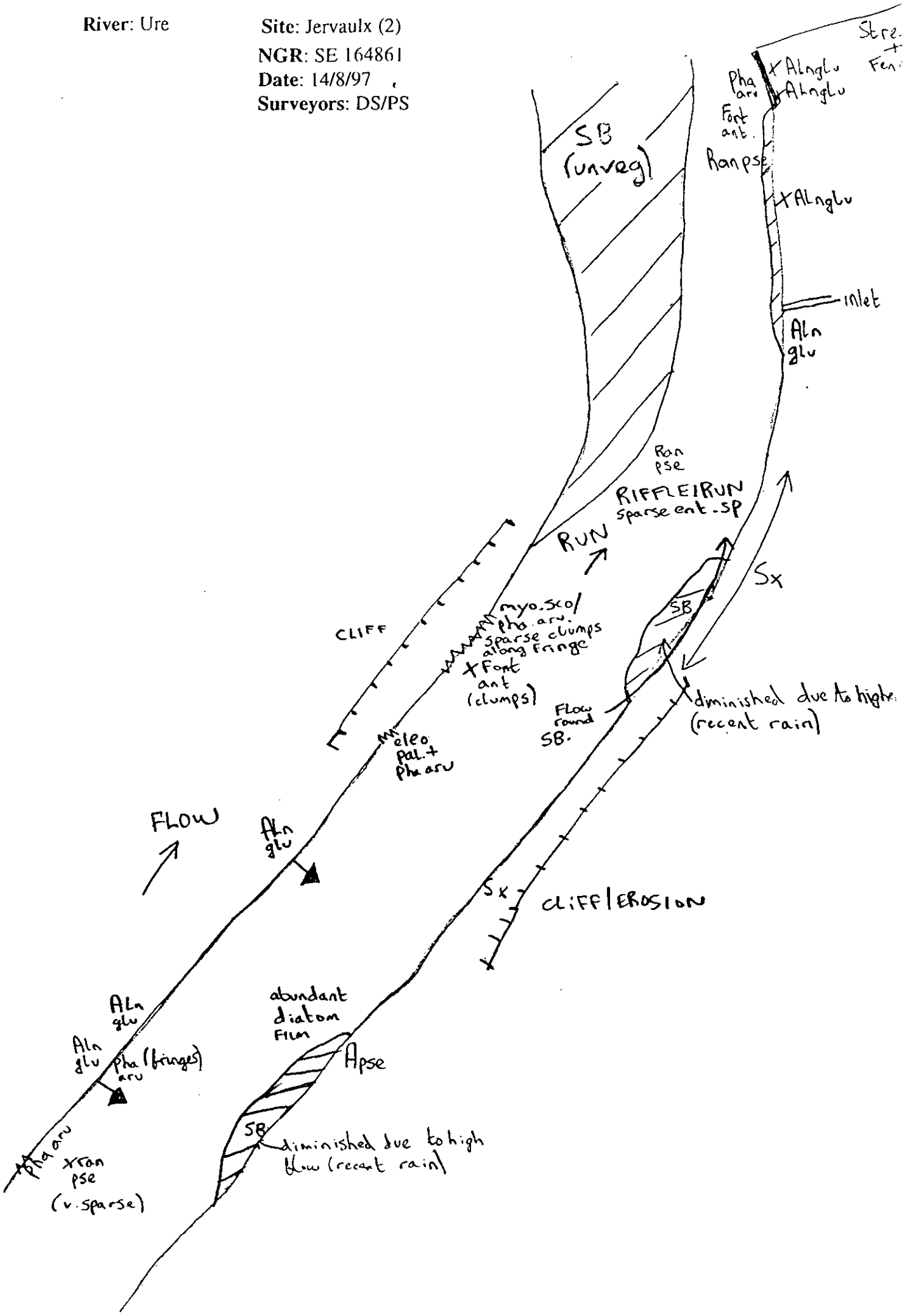


River: Ure **Site**: Ulshaw (1b) **NGR**: SE 145872
Date: 14/8/97
Surveyors: DS/PS

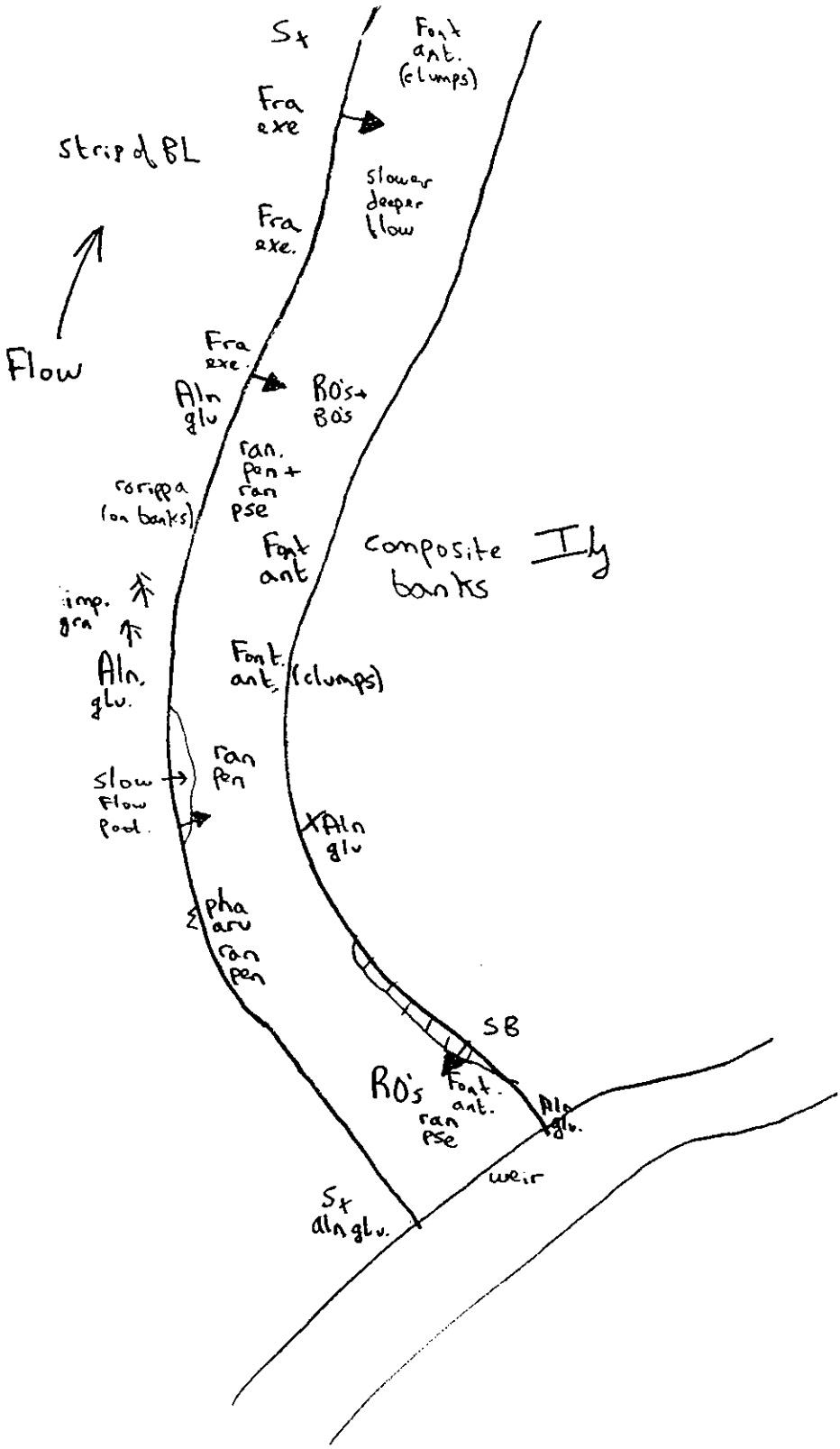


River: Ure

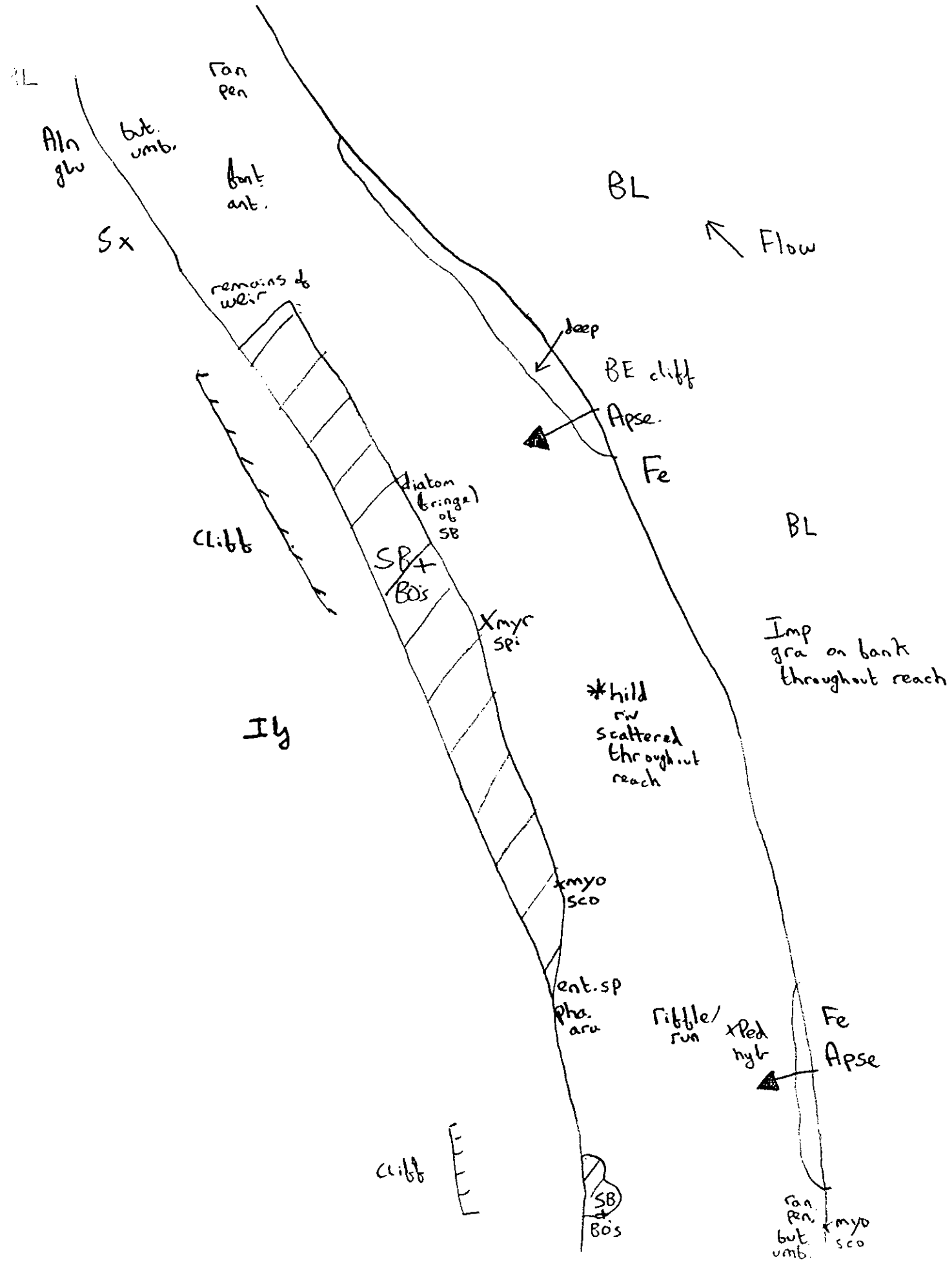
Site: Jervaulx (2)
NGR: SE 164861
Date: 14/8/97
Surveyors: DS/PS



River: Ure **Site**: d/s Kilgram Bridge intake (2b) **NGR**: SE 191860
Date: 13/8/97
Surveyors: DS/PS

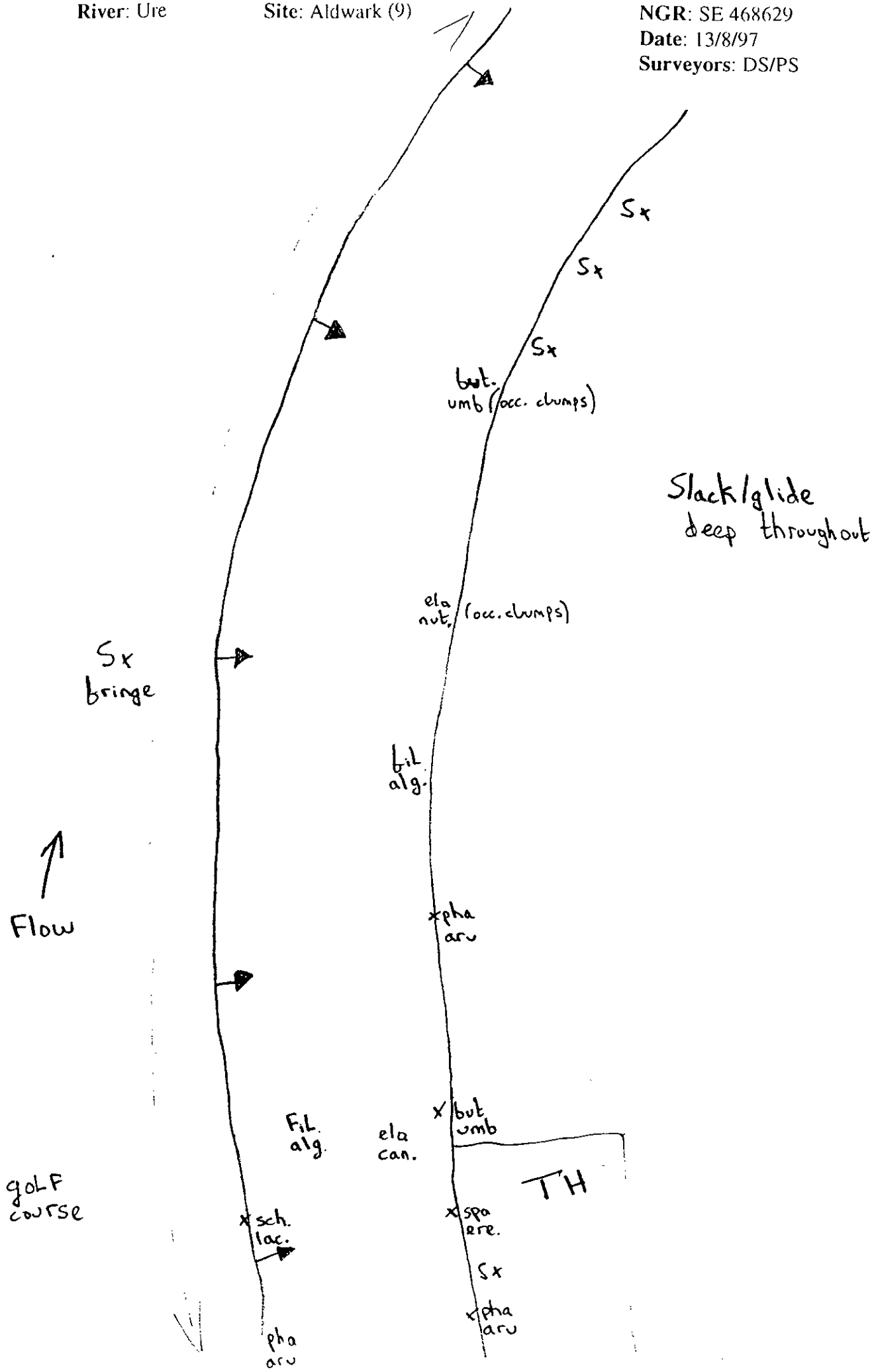


River: Ure **Site**: Clifton Castle (3) **NGR**: SE 222831
Date: 14/8/97
Surveyors: DS/PS

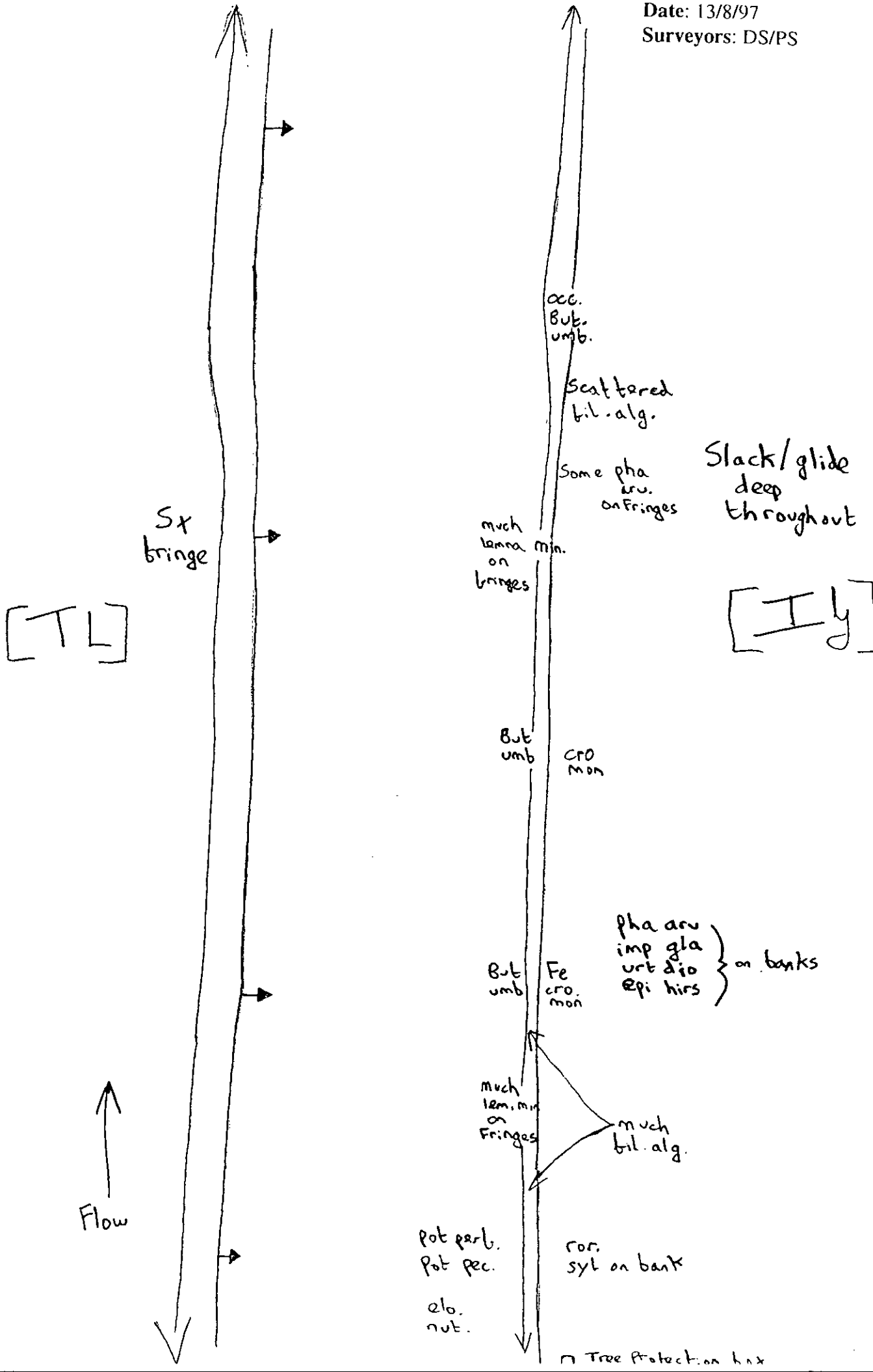


River: Ure **Site**: Aldwark (9)

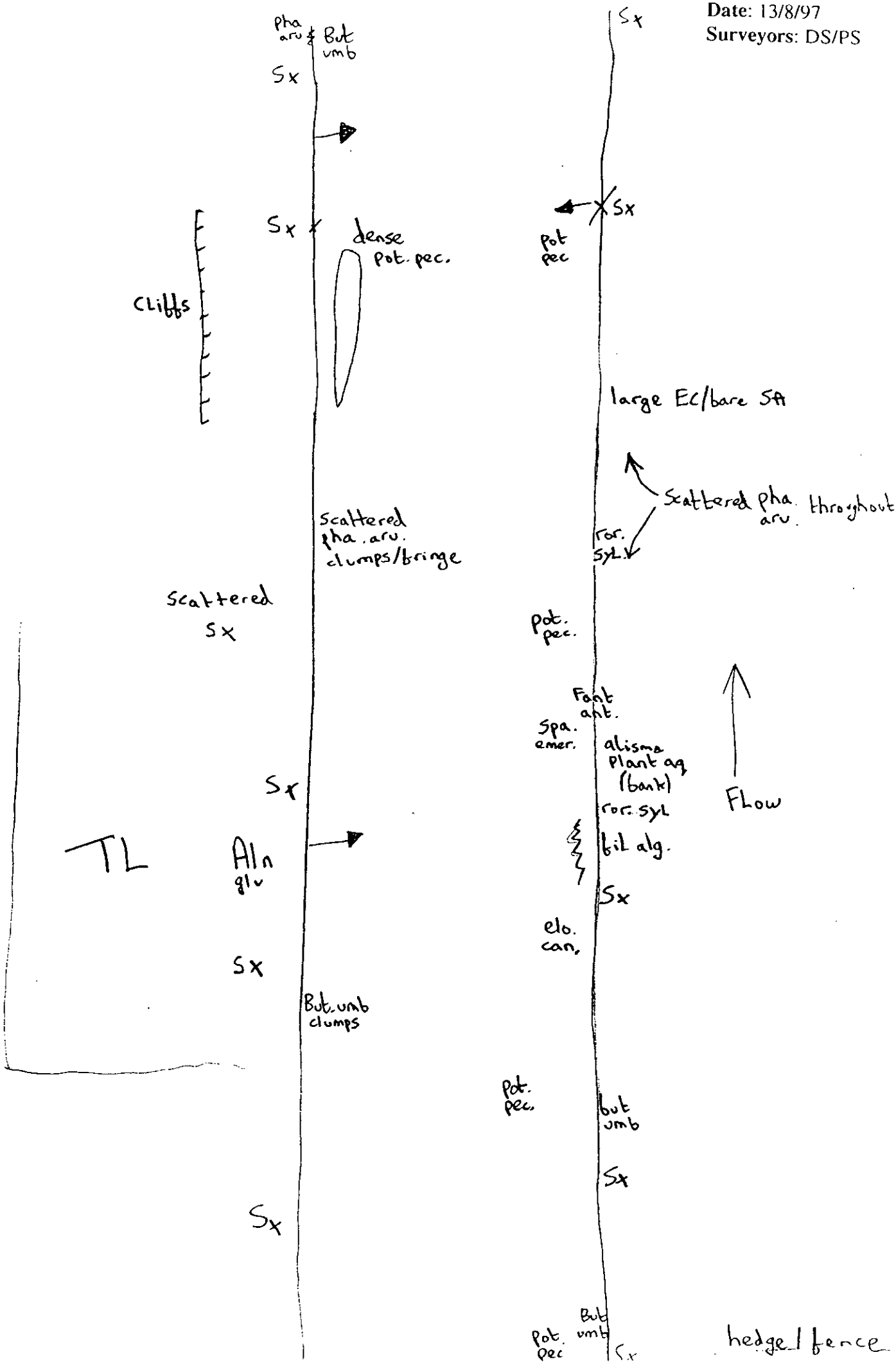
NGR: SE 468629
Date: 13/8/97
Surveyors: DS/PS



River: Ouse **Site**: d/s Moor Monkton intake (1) **NGR**: SE 53657(0)
Date: 13/8/97
Surveyors: DS/PS



River: Ouse Site: at Beningbrough Hall (2) NGR: SE 521581
Date: 13/8/97
Surveyors: DS/PS



Appendix III. Abbreviations used in report.

Abbreviation	Full name
Bry pal	*Bryum pallens*
Bry pse	*Bryum pseudotriquetrum*
Bry sp.	*Bryum* species
Car nig	*Carex nigra*
Cer dem	*Ceratophyllum demersum*
Col flu	*Collema fluviatile*
Des ces	*Deschampsia cespitosa*
Dic pel	*Dichodontium pellucidium*
Ent sp	*Enteromorpha* species
Epi hir	*Epilobium hirsutum*
Fis sp.	*Fissidens* species
Jun art	*Juncus articulatus*
Lem min	*Lemna minor*
Lys vul	*Lysimachia vulgaris*
Mar pol	*Marchantia polymorpha*
Men spi	*Mentha spicata*
Mim gut	*Mimulus guttatus*
Mni sp.	*Mnium* species
Myo sp	*Myosotis* species
Nas off	*Nasturtium officinale*
Nup lut	*Nuphar lutea*
Pel end	*Pellia endivifollia*
Per amp	*Persicaria amphibia*
Pla ros	*Plagiomnium rostratum*
Pol amp	*Polygonum amphibium*
Pot per	*Potamogeton perfoliatus*
Pot sue	*Potamogeton* x *suecicus*
Ran cal	*Ranunculus penicillatus* subsp. *pseudofluitans*
Ran pen	*Ranunculus penicillatus* subsp. *penicillatus*
Ror isl	*Rorippa islandica*
Ror nas aqu	*Rorippa nasturtium aquaticum*
Ror syl	*Rorippa sylvestris*
Scr aqu	*Scrophularia aquatica*
Scr aur	*Scrophularia auriculata*
Spa ere	*Sparganium erectum*
Tha alo	*Thamnobryum alopecorum*
Ver ana	*Veronica anagalis aquatica*
Ver bec	*Veronica beccabunga*
Verr sp.	*Verrucaria* species

Centre for Ecology & Hydrology

Institute of Freshwater Ecology
Institute of Hydrology
Institute of Terrestrial Ecology
Institute of Virology & Environmental Microbiology

Natural Environment Research Council