

**WATER QUALITY SECTION
CORNWALL AREA**

20A

FINAL DRAFT REPORT

**A macroinvertebrate survey of the Releath
stream and associated tributaries within the
vicinity of Trevethan farm .**

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Area Manager**

A macroinvertebrate survey of the Releath stream and associated tributaries within the vicinity of Trevethan farm.

INTRODUCTION

On 12/06/96 , following a request from the water quality section , a macroinvertebrate survey of the Releath stream within the vicinity of Trevethan farm was performed. This was in response to a report from a member of the public who had observed sewage fungus in the Releath stream.

METHODOLOGY

For the location of the 5 macroinvertebrate sampling points refer to Map (1) .The sampling methodology utilised in this survey is provided in Appendix (1).

RESULTS

Raw data obtained from each of the 5 sampling points is given in Appendix (11).

Table (1) provides a summary of the number of scoring taxa ,BMWP scores and ASPT scores for each of the 5 sampling points.

Graph (1) indicates how the abundance of group (1) sensitive taxa and Nemourid stoneflies varied in relation to organic enrichment emanating from the Trevethan farm tributary.

Appendix (1V) provides historic data for sites 4 and site 5 .

DISCUSSION

Refer to Appendix (111).



CONCLUSIONS

- 1) The macroinvertebrate survey performed on 12/06/96 found that the Trevethan farm tributary was severely contaminated with organic farm waste which had resulted in a severely impoverished macroinvertebrate community and 100 % sewage fungus cover .
- 2) The Releath stream upstream of the Trevethan farm tributary (Site 1) was found to contain a very diverse macroinvertebrate community that was consistent with a clean , headwater stream. Many taxa sensitive to organic pollution were abundant within the sample and sewage fungus was absent.
- 3) Site 3 , situated on the Releath stream immediately downstream of the confluence with the Trevethan farm tributary, was found to contain a low diversity of macroinvertebrates and a high abundance of sewage fungus .This situation reflected the impact of the Trevethan farm tributary upon the Releath stream.
- 4) Site 4, Releath stream at Vellanewson and site 5 , Bodilly Stream at Bodilly Mill both obtained BMWP and ASPT scores that were indicative of reasonable and good water quality respectively. Despite this however , the abundance of BMWP group (1) sensitive taxa and Nemourid stoneflies at both sites was found to be appreciably lower than that observed at Site 1. Sewage fungus was also evident at both sites which continued to affect the aesthetic nature of the watercourse .

REFERENCES

- 1) Hellowell (1986) *Biological indicators of freshwater pollution* Elsevier publishers Ltd

MAP SHOWING THE LOCATION OF THE 5 SAMPLING POINTS ON THE RELEATH STREAM.

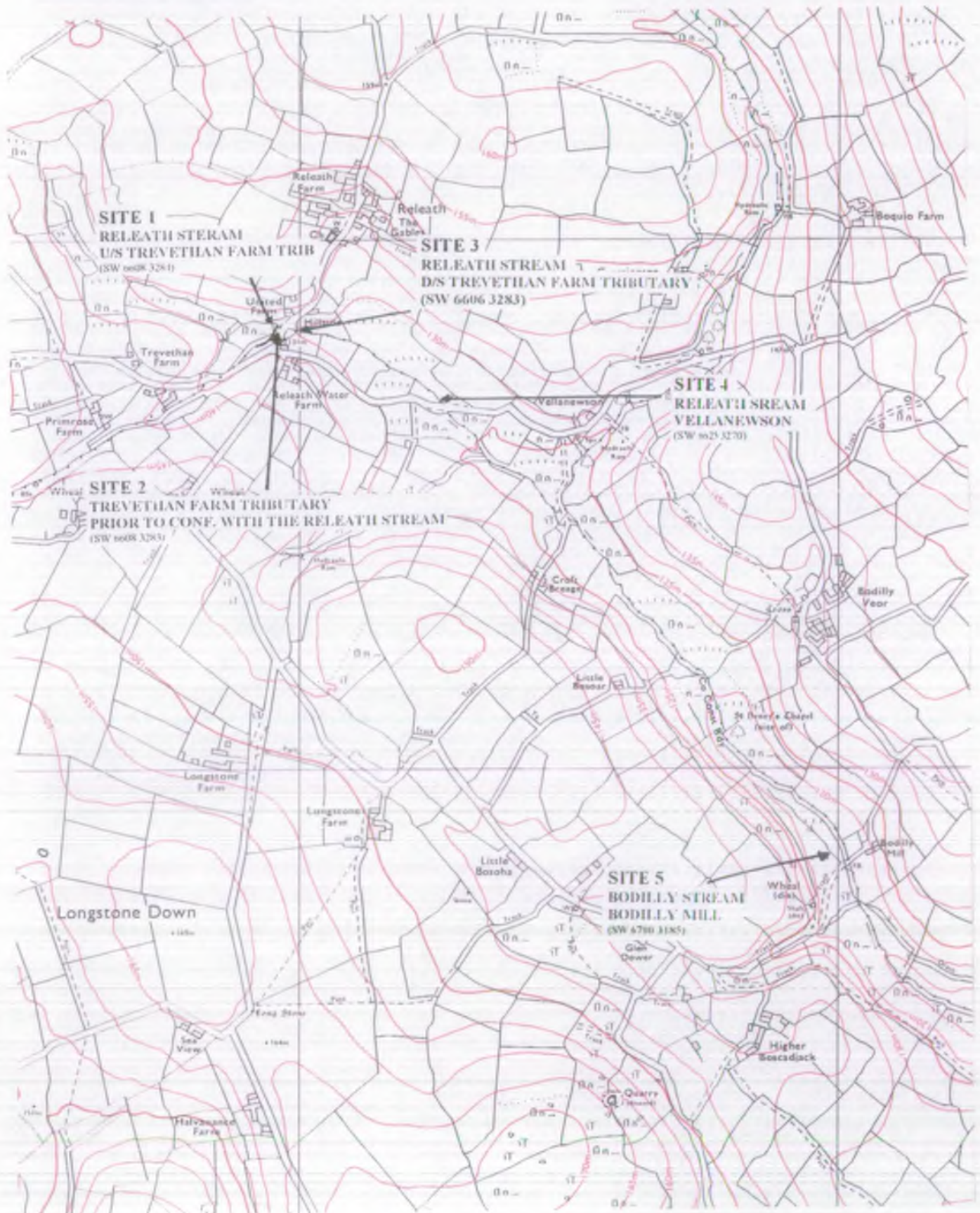


TABLE (1)

A TABLE SHOWING THE NO. OF TAXA , BMWP AND ASPT SCORES
OBTAINED AT EACH OF THE 5 SITES .

	RELEATH STREAM	TREVETHAN FARM TRIB	RELEATH STREAM	RELEATH SREAM	BODILLY STREAM
	U/S TREVETHAN FARM TRIB (SW 6608 3284)	U/S CONFLUENCE RELEATH STREAM (SW 6608 3284)	D/S TREVETHAN FARM TRIB (SW 6606 3283)	VELLANEWSON (SW 6606 3283)	BODILLY MILL (SW 6700 3185)
	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5
NUMBER OF TAXA	27	11	12	26	28
BMWP SCORE	176	49	59	152	185
ASPT SCORE	6.52	4.45	4.92	5.85	6.61

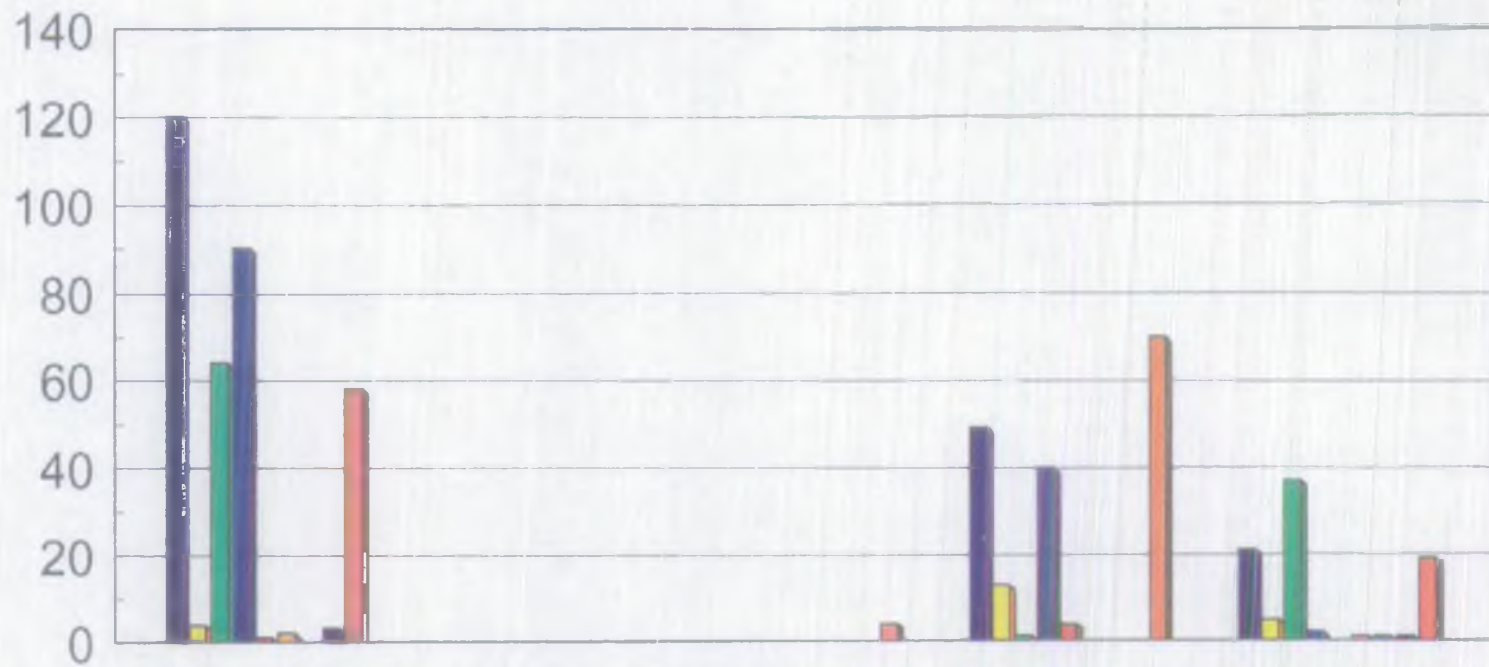
APPENDIX (I).

METHODOLOGY

At each of the 5 macroinvertebrate sampling points a 3 minute kick sample was performed using a standard pond net (1mm mesh) followed by a 1 minute habitat search .The sample was then preserved in 95 % IMS and 5 % Glycerol solution and returned to the laboratory for sieving , sorting and identification .Macroinvertebrates were identified to family level with the abundance of the most pollution sensitive BMWP (Biological Monitoring Working Party) group (1) taxa and Nemourid stoneflies counted . From the raw data obtained , a BMWP and ASPT (Average Score Per Taxon) score was calculated .The BMWP scoring system assigns a high score to pollution sensitive taxa (maximum of 10) and a low score (minimum of 1) to pollution tolerant taxa . The total score gives an indication of the overall status of the invertebrate community .The ASPT score provides additional information and aims to reduce sampling variation.

GRAPH 1

A GRAPH SHOWING THE NUMBERS OF GROUP (1) SENSITIVE TAXA AND NEMOURID STONEFLIES PRESENT AT EACH OF THE 5 SAMPLING POINTS



	SITE 1	SITE 2	SITE 3	SITE 4	SITE 5
LEUCTRIDAE	120	0	0	49	21
PERLODIDAE	4	0	0	13	5
CHLOROPERLIDAE	64	0	0	1	37
NEMOURIDAE	90	0	0	40	2
BERAEIDAE	1	0	0	4	0
LEPTOCERIDAE	2	0	0	0	1
GOERIDAE	0	0	0	0	1
LEPIDOSTOMATIDAE	3	0	0	0	1
SERICOSTOMATIDAE	58	0	4	70	19



APPENDIX (11)

RAW DATA OBTAINED FROM EACH OF THE 5 SAMPLING POINTS

SITE No. 1.

MACROINVERTEBRATE SURVEY DATA - CORNWALL AREA BIOLOGY LAB

RIVER: RELEATH STREAM.

SITE: U/S CONF. FARM TRIB.

NGR:

DATE: 12/06/96.

PURPOSE: POLLUTION INVESTIGATION LAB NO: AD. HOC.

SAMPLING OFFICER: S.T

SORTED: S.T

IDENTIFIED: S.T

COMMENTS:

	1	2	3		1	2	3
Planariidae	A			5	Elmidae	B	
Dendrocoelidae					Chrysomelidae		
Oligochaeta	A			1	Curculionidae		
Piscicolidae				4	Aphelocheiridae		
Glossiphoniidae					Mesovelidae		
Hirudidae				3	Hydrometridae		
Erpobdellidae					Gerridae		
Astacidae				6	Nepidae		
Corophiidae				6	Naucoridae		
Gammaridae					Notonectidae		
Asellidae				3	Pleidae		
Siphonuridae					Corixidae		
Potamanthidae					Tipulidae	A	
Heptageniidae				10	Simuliidae	A	
Leptophlebiidae					Chironomidae	B	
Ephemerebellidae					Neritidae		
Ephemeridae					Viviparidae		
Caenidae				7	Ancylidae	A	
Baetidae	A		(2)	4	Unionidae		
Lestidae					Sphaeriidae	A	
Calopterygidae					Valvatidae		
Gomphidae				6	Hydrobiidae	A	
Cordulegasteridae	B				Lymnaeidae		
Aeshnidae					Physidae		
Corduliidae					Planorbidae		
Libellulidae							
Platycnemididae				6	Porifera		
Coenagriidae					Polyzoa		
Sialidae				4	Nematoda		
Taeniopterygidae					Cladocera		
Leuctridae	C		(120)		Copepoda		
Capniidae				10	Ostracoda	A	
Perlodidae	A		(4)		Branchiura		
Perlidae					Veliidae	A	
Chloroperlidae	B		(6)		Psychodidae		
Nemouridae	B		(90)	7	Ceratopogonidae	A	
Phryganeidae					Culicidae		
Molannidae					Syrphidae		
Beraeidae	A		(1)		Muscidae		
Odontoceridae					Empididae	A	
Leptoceridae	A		(2)	10	Rhagionidae		
Goeridae					Dixidae		
Lepidostomatidae	A		(3)		Tabanidae		
Brachycentridae					Ptychopteridae		
Sericostomatidae	B		(58)		Thaumaleidae		
Psychomidae	A				Chaoboridae		
Philopotamidae	B			6	Stratiomyidae		
Rhyacophilidae	A				Hydrachnellidae		
Polycentropodidae	A			7	Halacaridae		
Limnephilidae	B				Dreissenidae		
Hydroptilidae				6			
Hydropsychidae	B						
Haliplidae					No of Scoring Families	27	
Hygrobiidae					No of other Families	4	
Dytiscidae				5	No of taxa	31	
Gyrinidae					BMWP	176	
Hydrophilidae	A				ASPT	6.52	
Scirtidae	A				Shannon		
Dryopidae					Mean Density		

COMBINED BMWP:

ASPT:

NO OF TAXA:

RIVER: TREVETHAN STR.
 DATE: 12/06/96.
 SAMPLING OFFICER: S.T.
 COMMENTS:

SITE: FARM DISCHARGE TRIB. NGR:
 PURPOSE: POLLUTION INVESTIGATION, LAB NO: AD HOC.
 SORTED: S.T IDENTIFIED: S.T.

	1	2	3			1	2	3
Planariidae				5	Elmidae			
Dendrocoelidae					Chrysomelidae			
Oligochaeta	A		(5)	1	Curculionidae			
Piscicolidae				4	Abelocheiridae			
Glossiphoniidae	C		(100)	3	Mesovelidae			
Hirudidae					Hydrometridae			
Erpobdellidae					Gerridae			
Astacidae				8	Nepidae			
Corophiidae					Naucoridae			
Gammaridae				6	Notonectidae			
Asellidae				3	Pleidae			
Siphonuridae					Corixidae			
Potamanthidae					Tipulidae	B		
Heptageniidae					Simuliidae	A		
Leptophlebiidae				10	Chironomidae	C		(355)
Ephemerellidae					Neritidae			
Ephemeridae					Viviparidae			
Caenidae				7	Ancylidae			
Baetidae				4	Unionidae			
Lestidae					Sphaeriidae	B		
Calopterygidae					Valvatidae			
Gomphidae					Hydrobiidae	C		
Cordulegasteridae	A			6	Lymnaeidae			
Aeshnidae					Physidae			
Corduliidae					Planorbidae			
Libellulidae								
Platycnemididae				6	Porifera			
Coenagriidae					Polyzoa			
Sialidae				4	Nematoda			
Taeniopterygidae					Cladocera			
Leuctridae					Copepoda			
Capniidae				10	Ostracoda			
Perlodidae					Branchiura			
Perlidae					Veliidae	A		
Chloroperlidae					Psychodidae	A		
Nemouridae				7	Ceratopogonidae	B		
Phryganeidae					Culicidae			
Molannidae					Syrphidae	A		
Beraeidae					Muscidae			
Odontoceridae					Empididae			
Leptoceridae				10	Rhagionidae			
Goeridae					Dixidae			
Lepidostomatidae					Tabanidae			
Brachycentridae					Ptychopteridae			
Sericostomatidae					Thaumaleidae			
Psychomidae				6	Chaoboridae			
Philopotamidae					Stratiomyidae			
Rhyacophilidae					Hydrachnellidae	A		
Polycentropodidae	A			7	Halacaridae			
Limnephilidae	A				Dreissenidae			
Hydroptilidae				6				
Hydropsychidae								
Haliplidae					No of Scoring Families	11		
Hygrobiidae					No of other Families	5		
Dytiscidae	A			5	No of taxa	16		
Gyrinidae					BMWP	49		
Hydrophllidae					ASPT	4.45		
Scirtidae					Shannon			
Dryopidae					Mean Density			

RIVER: RELEATH STREAM

SITE: D/S CONF FARM TRIB.

NGR:

DATE: 12/06/96

PURPOSE: POLLUTION INVESTIGATION LAB NO: AD HOC

SAMPLING OFFICER: S.T

SORTED: S.T

IDENTIFIED: S.T

COMMENTS:

	1	2	3		1	2	3
Planariidae				5	Elmidae		
Dendrocoelidae					Chrysomelidae		
Oligochaeta	A		(5)	1	Curculionidae		
Piscicolidae				4	Aphelocheiridae		
Glossiphoniidae	A				Mesovelidae		
Hirudidae				3	Hydrometridae		
Erpobdellidae					Gerridae		
Astacidae				8	Nepidae		
Corophiidae					Naucoridae		
Gammaridae				6	Notonectidae		
Asellidae				3	Pleidae		
Siphonuridae					Corixidae		
Potamanthidae					Tipulidae	B	
Heptageniidae					Simuliidae	A	
Leptophlebiidae				10	Chironomidae	B	(75)
Ephemerellidae					Neritidae		
Ephemeridae					Viviparidae		
Caenidae				7	Ancylidae	A	
Baetidae				4	Unionidae		
Lestidae					Sphaeriidae		
Calopterygidae					Valvatidae		
Gomphidae					Hydrobiidae	A	
Cordulegasteridae				8	Lymnaeidae		
Aeshnidae					Physidae		
Corduliidae					Planorbidae		
Libellulidae							
Platycnemididae				6	Porifera		
Coenagriidae					Polyzoa		
Sialidae				4	Nematoda		
Taeniopterygidae					Cladocera		
Leuctridae					Copepoda		
Capniidae					Ostracoda		
Perlodidae				10	Branchiura		
Perlidae					Veliidae		
Chloroperlidae					Psychodidae	A	
Nemouridae				7	Ceratopogonidae		
Phryganeidae					Culicidae		
Molannidae					Syrphidae		
Beraeidae					Muscidae		
Odontoceridae					Empididae	A	
Leptoceridae				10	Rhagionidae		
Goeridae					Dixidae		
Lepidostomatidae					Tabanidae		
Brachycentridae					Ptychopteridae		
Sericostomatidae	A		(4)		Thaumaleidae		
Psychomidae					Chaoboridae		
Philopotamidae				8	Stratiomyidae		
Rhyacophilidae					Hydrachnellidae		
Polycentropodidae	A			7	Halacaridae		
Limnephilidae	A				Dreissenidae		
Hydroptilidae				6			
Hydropsychidae							
Haliplidae							
Hygrobiidae					No of Scoring Families	12	
Dytiscidae	A			5	No of other Families	2	
Gyrinidae					No of taxa	14	
Hydrophilidae	A				BMWP	59	
Scirtidae					ASPT	4.92	
Dryopidae					Shannon		
					Mean Density		

COMBINED BMWP:

ASPT:

NO OF TAXA:

MACROINVERTEBRATE SURVEY DATA

10/89

RIVER: KALAMAZOO RIVER
 DATE: 10/10/89
 SAMPLING OFFICER: ST

SITE: VILLAGE
 PURPOSE: WATER QUALITY
 SORTED: KE

NGR:
 LAB NO: 2010
 IDENTIFIED: KE

COMMENTS:

	1	2	3			1	2	3
Planariidae				5	Elmidae	B		
Dendrocoelidae					Chrysomelidae			
Oligochaeta	A		(5)	1	Curculionidae			
Piscicolidae				6	Apelocheiridae			
Glossiphoniidae	A				Mesovelidae			
Hirudidae				3	Hydrometridae			
Erpobdellidae	A				Gerridae			
Astacidae				8	Nepidae			
Corophiidae				6	Naucoridae			
Gammaridae					Notonectidae			
Asellidae	A			3	Pleidae			
Siphonuridae					Corixidae			
Potamanthidae					Tipulidae	B		
Heptageniidae				10	Simuliidae	A		
Leptophlebiidae					Chironomidae	B		
Ephemerellidae					Neritidae			
Ephemeridae					Viviparidae			
Caenidae				7	Ancylidae	B		
Baetidae				4	Unionidae			
Lestidae					Sphaeriidae	C		
Calopterygidae					Valvatidae			
Gomphidae				8	Hydrobiidae	C		
Cordulegasteridae	B				Lymnaeidae	A		
Aeshnidae					Physidae			
Corduliidae					Planorbidae			
Libellulidae								
Platycnemididae				6	Porifera			
Coenagriidae	A				Polyzoa			
Sialidae				4	Nematoda			
Taeniopterygidae					Cladocera			
Leuctridae	B		(49)		Copepoda			
Capniidae				10	Ostracoda			
Perlodidae	B		(13)		Branchiura			
Perlidae					Veliidae			
Chloroperlidae	A		(1)		Psychodidae	A		
Nemouridae	B		(40)	7	Ceratopogonidae	B		
Phryganeidae					Culicidae			
Molannidae					Syrphidae			
Beraeidae	A		(4)		Muscidae			
Odontoceridae					Empididae			
Leptoceridae				10	Rhagionidae			
Goeridae					Dixidae			
Lepidostomatidae					Tabanidae			
Brachycentridae					Ptychopteridae			
Sericostomatidae	B		(70)		Thaumaleidae			
Psychomidae				8	Chaoboridae			
Philopotamidae					Stratiomyidae			
Rhyacophilidae	A			7	Hydrachnellidae	A		
Polycentropodidae	B				Halacaridae			
Limnephilidae	B			6	Dreissenidae			
Hydroptilidae								
Hydropsychidae	A							
Haliplidae					No of Scoring Families	16		
Hygrobidae					No of other Families	3		
Dytiscidae	2			5	No of taxa	29		
Gyrinidae					BMWP	152		
Hydrophilidae	F				ASPT	2.5		
Scirtidae					Shannon			
Dryopidae					Mean Density			

COMBINED BMWP:

ASPT:

NO OF TAXA:

RIVER: BODILLY STREAM.
 DATE: 12/06/96
 SAMPLING OFFICER: S.T
 COMMENTS:

SITE: BODILLY MILL.
 PURPOSE: POLLUTION INVESTIGATION
 SORTED: S-T

NGR:
 LAB NO:
 IDENTIFIED: S.T

	1	2	3		1	2	3
Planariidae	A			5	Elmidae	A	
Dendrocoelidae					Chrysomelidae		
Oligochaeta	A		(1)	1	Curculionidae		
Piscicolidae				4	Aphelocheiridae		
Glossiphoniidae					Mesovelidae		
Hirudidae				3	Hydrometridae		
Erpobdellidae					Gerridae		
Astacidae				8	Nepidae		
Corophiidae					Naucoridae		
Gammaridae	A			6	Notonectidae		
Asellidae				3	Pleidae		
Siphonuridae					Corixidae		
Potamanthidae					Tipulidae	A	
Heptageniidae				10	Simuliidae		
Leptophlebiidae					Chironomidae	B	(17)
Ephemerellidae	B		(10)		Neritidae		
Ephemeridae					Viviparidae		
Caenidae				7	Ancylidae	A	
Baetidae	A			4	Unionidae		
Lestidae					Sphaeriidae	A	
Calopterygidae					Valvatidae		
Gomphidae				8	Hydrobiidae	B	
Cordulegasteridae	A				Lymnaeidae		
Aeshnidae					Physidae		
Corduliidae					Planorbidae		
Libellulidae							
Platycnemididae				6	Porifera		
Coenagriidae					Polyzoa		
Sialidae				4	Nematoda		
Taeniopterygidae					Cladocera		
Leuctridae	B		(21)		Copepoda		
Capniidae				10	Ostracoda		
Perlodidae	A		(4)		Branchiura		
Perlidae					Veliidae		
Chloroperlidae	B		(3)		Psychodidae		
Nemouridae	A		(2)	7	Ceratopogonidae	A	
Phryganeidae					Culicidae		
Molannidae					Syrphidae		
Beraeidae					Muscidae	A	
Odontoceridae					Empididae	A	
Leptoceridae	A		(1)	10	Rhagionidae		
Goeridae	A		(1)		Dixidae		
Lepidostomatidae	A		(1)		Tabanidae		
Brachycentridae					Ptychopteridae		
Sericostomatidae	B		(19)		Thaumaleidae		
Psychomidae	A				Chaoboridae		
Philopotamidae				6	Stratiomyidae		
Rhyacophilidae	A				Hydrachnellidae	A	
Polycentropodidae	A			7	Halacaridae		
Limnephilidae	A				Dreissenidae		
Hydroptilidae	A			6			
Hydropsychidae	A						
Haliplidae							
Hygrobiidae					No of Scoring Families	28	
Dytiscidae	A			5	No of other Families	4	
Gyrinidae					No of taxa	32	
Hydrophilidae	A				BMWP	185	
Scirtidae					ASPT	6.61	
Dryopidae					Shannon		
					Mean Density		

DISCUSSION

On arrival at the Trevethan farm tributary, an initial inspection of the stream was made by walking upstream (u/s) from its confluence with the Releath stream to its source situated in a marshy area approximately 10 m above Trevethan farm. It immediately became evident that the stream was heavily infested by sewage fungus and smelled strongly of decaying organic waste material. The only area of the stream found to be free from sewage fungus was a 10 m length extending from above the Trevethan farm buildings and in particular the silage clamp to the marsh source outflow. The stream within the vicinity of the farm was heavily choked by Hemlock water dropwort *Oenanthe crocata*, which prevented a representative biological sample from being taken. However, it was possible to take a sample from the tributary approximately 10 m above its confluence with the Releath stream.

The results of the biological sample analysis for each of the 5 sites are listed in Table (1). They provided conclusive evidence that the Trevethan farm tributary has had a major impact on the macroinvertebrate community of the Releath stream.

Site (1) was situated on the Releath stream approximately 5 m u/s of the confluence with the Trevethan farm tributary. A very diverse macro invertebrate community was found to be present that provided a BMWP score of 176 and an ASPT score of 6.52. This indicated good water quality. 7 group (1) taxa that are sensitive to organic pollution were found in the sample which reflected the absence of organic matter entering the Releath stream above this point. A juvenile Brown trout was found in the sample. Sewage fungus was absent from the stream at this point.

The sample from the Trevethan farm tributary, Site 2, was found to contain an extremely impoverished macroinvertebrate community. Chironomid fly larvae and the leach *Helobdella stagnalis* were found to dominate the community. These organisms are known to be tolerant of high organic loadings and low dissolved oxygen levels. The BMWP and ASPT scores of 49 and 4.45 respectively reflect poor water quality that is consistent with a severe, chronic discharge of organic matter to the watercourse. In addition to the poor macroinvertebrate community, sewage fungus was very abundant (100% cover) and the stream smelled strongly of decaying organic material. No group (1) sensitive taxa were found within the sample.

Site 3 was situated on the Releath stream 10 m downstream of the Trevethan farm tributary. The BMWP (59) and ASPT (4.92) scores indicated a severe reduction in water quality compared to the u/s sampling point at site 1. This decline can be attributed to the Trevethan farm tributary and the taxa obtained in the sample were almost identical to those obtained in the sample from site 2. Sewage fungus was found to be present at an estimated abundance of 80%.

Site 4 Releath stream at Vellanewson was previously sampled in 1991 and 1992 and is situated 600 m d/s of the Trevethan farm confluence. The macroinvertebrate community at this site had improved considerably compared to site 3 with the BMWP and ASPT scores increasing to 152 and 5.85 respectively and representing reasonable water quality. Group (1) sensitive taxa were again evident within the sample although at far lower abundances than that observed at site (1). Sewage fungus was still present but less abundant at this site (50% cover).

Site 5 on the Bodilly stream at Bodilly mill is also a routine biological monitoring site and was

situated approximately 900 m below the confluence with the Releath stream. This site obtained BMWP (185) and ASPT (6.61) scores which reflected good water quality and were the highest ever attained at this site (see Appendix IV). 8 group (1) sensitive taxa were found in the sample which was comparable to the situation found at site 1. Sewage fungus was again present but at an estimated abundance of 10%. Brown trout were also observed at this site.

Graph (1) indicates how the abundance of group (1) sensitive taxa and Nemourid stoneflies varied at each site. It can be seen that the highest abundances of these taxa were found at site 1 with all but the Sericostomatid cased caddis fly larvae being eliminated at site 3, which was situated downstream of the Trevethan farm tributary. No group (1) taxa or Nemourid stoneflies were present at site 2 on the Trevethan farm tributary. The graph also indicates that although group (1) taxa were present at site 4 and site 5, their numbers were much lower than that observed at site 1. The Trevethan farm tributary may therefore be responsible for the observed reduction in the abundance of these taxa at these sites.

The development of profuse growths of sewage fungus is a characteristic indicator of organic discharges. However, the presence of sewage fungus does not automatically indicate high BOD or low dissolved oxygen (DO) levels. Some sewage fungus species can be associated with rapidly biodegradable organic materials (Eg. sugars within silage), elevated nitrogenous/phosphorous compound levels or a combination of both factors coupled with a high water DO level (Hellowell 1986). It is therefore possible to encounter relatively high abundances of sewage fungus in the presence of relatively diverse macroinvertebrate populations.

In summary, the Trevethan farm tributary would appear to be having a major impact upon the macroinvertebrate community within the vicinity of its confluence with the Releath stream. The BMWP scores show that a recovery had occurred at both sites 4 and 5 although the abundances of the group (1) sensitive taxa remained substantially lower. The high abundance of sewage fungus within the Trevethan farm tributary and Releath stream at sites 3 and 4 provide an indication of the chronic nature of the discharge.

APPENDIX (IV)

HISTORICAL DATA FOR SITES 4 AND 5

Taxa List for NR06.2004 Bodilly Stream Bodilly Mill SW67003185
 11 Samples taken previous to 02/07/1996

Biology Area	06	06	06	06	06	06	06	06	06	16	16
Day	19	13	03	01	27	07	15	22	10	13	23
Month	Mar	Jun	Sep	May	Jul	Oct	Mar	Jun	Sep	Mar	Oct
Year	1991	1991	1991	1992	1992	1992	1993	1993	1993	1995	1995
*Non Routine Sample Sample Number	1435	0717	1347	0517	0715	1409	0459	0616	1543	0036	0507
HEPTAGENIIDAE							*			*	
LEPTOPHLEBIIDAE										*	
EPHEMERELLIDAE		*	*	*	*			*			
LEUCTRIDAE	***	*	**	***	**	**	**	*	**	**	*
PERLODIDAE	*	**	*	**	*	*	*			**	
CHLOROPERLIDAE	*	*	*	**	*		*	*		**	
BERAEIDAE						*					
LEPTOCERIDAE	*		*							*	
GOERIDAE	*	*	*	**		*	*		*	**	*
LEPIDOSTOMATIDAE										*	*
SERICOSTOMATIDAE	**	**	**	**	**	**	**	**	*	*	*
CALOPTERYGIDAE	*										
CORDULEGASTERIDAE	*		*	*		*	*	*	*		*
PSYCHOMYIIDAE							*				
PHILOPOTAMIDAE										*	
NEMOURIDAE	*	**	**	**		**	**		*	**	*
RHYACOPHILIDAE	**	*	*	**	*	*	*	*	**	*	*
POLYCENTROPODIDAE		*	*	**	**	*	*	*	**	**	*
LIMNEPBILIDAE	***	**	*	**	**	*	*	**	**	*	*
ANCYLIDAE	**	*	*	*	*	*			*	*	*
HYDROPTILIDAE										*	
DYTISCIDAE			*	*							
GYRINIDAE									*		
HYDROPHILIDAE	*	**	*	*	*	*			**		*
SCIRTIDAE					*				*		
ELMIDAE	**	**	**	**	**	**	**	**	**	**	*
HYDROPSYCHIDAE	**	**	*	**	**	**	**	*		**	*
TIPULIDAE	**	**	**	**	**	**	*	*	**	**	*
SIMULIIDAE	**	**	**	*	**	**	**	**	**	**	*
PLANARIIDAE		*	*				*		*	**	*
BAETIDAE	***	**	*	**	*	**	**		**	**	*
HYDROBIIDAE			*		*			*	*	*	*
LYMNAEIDAE					*						
SPHAERIIDAE	*	*	**	*		*	*	*	*	*	*
GLOSSIPHONIIDAE			*	*							
CHIRONOMIDAE	**	**	**	**	**	**	**	**	**	**	**
BMWP Score	138	134	163	145	120	127	139	98	120	181	125
Pred. BMWP Score											
BMWP/Pred BMWP											
ASPT	6.57	6.38	6.27	6.30	6.00	6.35	6.62	6.13	5.71	6.70	5.95
Predicted ASPT											
ASPT/Pred ASPT											
Biotic Class	B	B	A	B	B	B	B	C	B	A	B

.. Cont

Taxa List for NR06.2004 Bodilly Stream Bodilly Mill SW67003185

11 Samples taken previous to 02/07/1996

Biology Area	06	06	06	06	06	06	06	06	06	16	16
Day	19	13	03	01	27	07	15	22	10	13	23
Month	Mar	Jun	Sep	May	Jul	Oct	Mar	Jun	Sep	Mar	Oct
Year	1991	1991	1991	1992	1992	1992	1993	1993	1993	1995	1995
*Non Routine Sample Sample Number	1435	0717	1347	0517	0715	1409	0459	0616	1543	0036	0507
OLIGOCHAETA	**	**	*	**	**	**	**	**	**	**	*
CERATOPOGONIDAE	*		*	*		*					*
EMPIDIDAE				*				*	*	*	
HYDRACARINA					*				*		*
OSTRACODA			*	*	*						*
PSYCHODIDAE			*		*			*	*		
VELIIDAE			*						*		
DIPTERA								*		*	
BMWP Score	138	134	163	145	120	127	139	98	120	181	125
Pred. BMWP Score											
BMWP/Pred BMWP											
ASPT	6.57	6.38	6.27	6.30	6.00	6.35	6.62	6.13	5.71	6.70	5.95
Predicted ASPT											
ASPT/Pred ASPT											
Biotic Class	B	B	A	B	B	B	B	C	B	A	B

Taxa List for NR06.2010 Releath Stream Vellanewson SW66253270
 6 Samples taken previous to 03/07/1996

Biology Area	06	06	06	06	06	06
Day	04	14	03	01	27	07
Month	Mar	Jun	Sep	May	Jul	Oct
Year	1991	1991	1991	1992	1992	1992
Non Routine Sample Sample Number	0385	0541	1342	0521	0763	1413
LEPTOPHLEBIIDAE	*					
LEUCTRIDAE	**	*	*		*	*
PERLODIDAE	*	*	*			
BERAEIDAE			*	*		*
LEPTOCERIDAE	*					
GOERIDAE	*					
SERICOSTOMATIDAE	*			*		
CORDULEGASTERIDAE	*			*	*	
NEMOURIDAE	**	*	**	**	*	**
RHYACOPHILIDAE		*	*			
POLYCENTROPODIDAE	**	*	*	*	**	*
LIMNEPHILIDAE	*	*	*	**	*	
ANCYLIDAE	*	*	*	**	*	*
DYTISCIDAE	*					**
HYDROPHILIDAE	*				*	*
ELMIDAE	*	*		**		*
HYDROPSYCHIDAE	*	*		**		
TIPULIDAE	**	**	**	**	**	*
SIMULIIDAE	*	**	**	*	**	**
PLANARIIDAE						*
BAETIDAE	**	*	*			
HYDROBIIDAE	**	***	***	***	**	**
SPHAERIIDAE	**	*	**	**	**	**
GLOSSIPHONIIDAE	*	*	*		*	*
ERPOBDELLIDAE			*	*	*	
ASELLIDAE	**		*		*	*
CHIRONOMIDAE	**	**	**	**	**	**
OLIGOCHAETA	*	*	*	**	**	**
CERATOPOGONIDAE	*	*				
EMPIDIDAE	*					
HYDRACARINA	*		*			
OSTRACODA					*	
PSYCHODIDAE	*	*	*		*	*
PTYCHOPTERIDAE						*
STRATIOMYIDAE			*			
DIPTERA						*
BMWP Score	144	90	96	87	78	85
Pred. BMWP Score						
BMWP/Pred BMWP						
ASPT	6.00	5.29	5.33	5.44	4.88	5.00
Predicted ASPT						
ASPT/Pred ASPT						
Biotic Class	B	C	C	C	C	C