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DEVON AREA INTERNAL REPORT

**AN INVESTIGATION INTO ELEVATED BOD
LEVELS AT BROCKEN BRIDGE (R30H001)
ON THE BARNSTAPLE YEO**

**DECEMBER 1995
DEV/E/20/95**

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AN INVESTIGATION INTO ELEVATED BOD LEVELS AT BROCKHAM BRIDGE (R30H001) ON THE BARNSTAPLE YEO.

1. INTRODUCTION

The Barnstaple Yeo is a tributary of the River Taw and rises east of Berry Down in north Devon. The river flows south then south west for approximately 18 km before its confluence with the River Taw estuary.

There are at present three sites on the River Yeo that are routinely chemically monitored. Brockham Bridge (R30H001 at NGR SS 6034 4083) has a current River Ecosystem Use (RE) Class target of 2. However, it is being considered that in the future this target will be increased to an RE class of 1.

2. TERMS OF REFERENCE

2.1 OBJECTIVES

A request was received from Regional Quality Planning to briefly investigate the area above Brockham Bridge. Although current classification will meet the River Quality Objective (RQO) of RE class 2, if the class is calculated on the future proposed Environmental Quality Standards (EQS) for a class 1, the site would fail.

In this study, the area concerned has been investigated to identify possible cause of poor water quality of the watercourse.

2.3 PROJECT TEAM

T. Cronin (Project Leader)
P. Rose (Project Manager, author)

3. METHOD

1. Analysis of routine water quality data to establish any trends and / or relationships between water quality and other factors such as rainfall and drought.
2. Talk to Water Quality Officers to ascertain possible problem areas.
3. Carry out a catchment investigation using sewage fungus as a primary indicator to track down problem areas.
4. Inform the Water Quality Officer for the area of any major inputs that are causing impact in the watercourse.



4. RESULTS

4.1 HISTORIC RESULTS

Analysis of routine water quality data taken at Brockham Bridge between the period of 01 January 1992 and 08 November 1995 (see APPENDIX I) show the following exceedances (using RE class 1 EQS's, see APPENDIX II):

BOD 6 (from 46 samples taken) EQS =2.5 mg/l as 90 %-ile
Total ammonia 1 (from 46 samples taken) EQS = 0.25 mg/l as 95 %-ile
The exceedances are associated with rainfall.

4.2 INVESTIGATION RESULTS

See proformas enclosed.

5. DISCUSSION

The Beccott Farm area is the most likely cause of the elevated BOD levels and of the single total ammonia exceedance detected at Brockham Bridge.

From the quantity of sewage fungus present in the tributary, it would appear that there may be a chronic input to the stream from the farm which may in itself be insufficient to result in exceedance at the routine monitoring site under dry weather conditions. With rainfall however, the input is probably great enough to result in the failures recorded downstream.

Preston Farm is probably contributing to the problem of low water quality during and after rain.

6. CONCLUSION

1. Beccott Farm area has an illegal discharge that is entering the watercourse and is probably responsible for exceedances recorded at the downstream routine monitoring site during wet weather.
2. Preston Farm has the potential to contribute to poor water quality downstream during wet weather.

7. RECOMMENDATIONS

1. Beccott Farm area to be visited by the Water Quality Officer (WQO).
2. Preston Farm area to be visited by the WQO.

SITE: Beccott Farm area.

WATERCOURSE Tributary of Barnstaple Yeo

NGR SS 6120 4190

EVIDENCE OF WATER QUALITY PROBLEM

Farm Tributary covered with 100% sewage fungus, sewage fungus downstream of this tributary increased to approximately 20 % cover.

On following up, the tributary smelt of farm effluent. Upstream of Lower Beccott Farm, colony sizes increased substantially. No sewage fungus located upstream.

SOURCE OF PROBLEM:

Area of Beccott Farm. Several farms inter-twined. Water Quality Officer for area informed immediately in order to inspect and sample area as necessary.



IMPLICATIONS:

By the cover and colony size of the sewage fungus present, this is probably a chronic problem exacerbated by rainfall events. The Beccott Farm area has the potential to cause chemical impact at the routine water quality monitoring site downstream at Brockham Bridge.

RECOMMENDATIONS:

The Water Quality Officer has been notified in order that the discharge may be controlled.

SITE: Preston Farm, 'Rectory' area.

WATERCOURSE Tributary of Bamstaple Yeo, Parsonage Lane area

NGR SS 6240 4290

EVIDENCE OF WATER QUALITY PROBLEM

Small stream at side of track covered with 100 % sewage fungus. Causing sewage fungus to approximate 5 - 10 % cover downstream at Kentisbury Ford. Upstream of the farm area there was no sewage fungus present.

SOURCE OF PROBLEM:

The stream runs through Preston Farm and the old Rectory' property. This area was particularly deep with farm waste. Further investigation was not thought appropriate as two work-men downstream of this area has described the farmer to be slightly difficult to deal with.

The Water Quality Officer for the area was informed.



IMPLICATIONS:

This farm will probably cause localised impact during wet weather and could contribute to impact downstream at Brockham Bridge under the same conditions.

RECOMMENDATIONS:

The Water Quality Officer has been notified .

APPENDIX I

ANALYTICAL SUMMARY OF:-

RIVER YEO (BARNSTAPLE) AT BROCKHAM BRIDGE

Date	Time	Type	Purp	Mat	OXYGEN DISS % SATN	BOD ATU MG/L	AMMON-IA MG/L N
140192	1440	SQMR	2F		107	1.2	0.02
180292	1015	SQMR	2F		99	2.2	0.18
020392	1030	SQMR	2F		97	1.0	0.02
310392	0905	SQMR	2F		97	1.1	0.02
290492	0745	SQMR	2F		97	1.1	0.02
050692	1110	SQMR	2F		93	1.4	0.03
150792	1430	SQMR	2F		92	1.0	0.04
160892	1130	SQMR	2F		94	1.3	0.03
300992	1300	SQMR	2F		96	1.0	0.16
291092	1200	SQMR	2F		94	1.1	0.02
171192	1210	SQMR	2F		97	1.1	0.04

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ANALYTICAL SUMMARY OF:-

RIVER YEO (BARNSTAPLE) AT BROCKHAM BRIDGE

Date	Time	Type	Purp	Mat	OXYGEN DISS % SATN	BOD ATU MG/L	AMMON-IA MG/L N
111292	0755	SQMR	2F		96	1.0	0.05
130192	1050	SQMR	2F		97	1.2	0.06
050292	0810	SQMR	2F		100	1.0	0.04
240392	1515	SQMR	2F		99	1.1	0.02
100492	1700	SQMR	2F		94	1.0	0.02
050592	1840	SQMR	2F		90	1.4	0.02
110692	1455	SQMR	2F		93	25.4	0.35
140792	1055	SQMR	2F		92	1.3	0.03
110892	1435	SQMR	2F		94	1.2	0.03
151092	1500	SQMR	2F		93	1.2	0.03
011192	1120	SQMR	2F		95	1.0	0.02

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ANALYTICAL SUMMARY OF:-

RIVER YEO (BARNSTAPLE) AT BROCKHAM BRIDGE

Date	Time	Type	Purp	Mat	OXYGEN DISS % SATN	BOD ATU MG/L	AMMON- IA MG/L N
151193	1300	SQMR	2F		94	1.3	0.04
021293	1330	SQMR	2F		97	1.5	0.21
120194	1125	SQMR	2F		96	2.8	0.22
020294	1235	SQMR	2F		96	1.1	0.03
170294	1155	SQMR	2F		101	1.0	0.03
250394	1150	SQMR	2F		100	10.7)	0.07
230494	1445	SQMR	2F		95	1.0	0.15
140694	1725	SQMR	2F		96	1.1	0.02
250794	0940	SQMR	2F		99	3.1	0.02<
140994	1550	SQMR	2F		98	2.3	0.13
061094	1100	SQMR	2F		104	1.2	0.02<

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ANALYTICAL SUMMARY OF:-

RIVER YEO (BARNSTAPLE) AT BROCKHAM BRIDGE

Date	Time	Type	Purp	Mat	OXYGEN DISS % SATN	BOD ATU MG/L	AMMON- IA MG/L N
271094	1550	SQMR	2F		95	2.7	0.23
161194	1610	SQMR	2F		96	1.2	0.03
151294	1610	SQMR	2F		98	1.2	0.03
020295	0940	SQMR	2F		103	1.0	0.04
030395	1050	SQMR	2F		98	1.2	0.06
220395	1525	SQMR	2F		100	1.0<	0.03<
200495	1000	SQMR	2F		101	1.6	0.05
220595	1135	SQMR	2F		105	1.3	0.03<
260695	1020	SQMR	2F		96	1.4	0.03<
310795	1045	SQMR	2F		80	1.0<	0.03<
290995	1530	SQMR	2F		100	1.4	0.03<

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READY

ANALYTICAL SUMMARY OF:-

RIVER YEO (BARNSTAPLE) AT BROCKHAM BRIDGE

Date	Time	Type	Purp	Mat	OXYGEN DISS % SATN	BOD ATU MG/L O	AMMON- IA MG/L N
251095	1040	SQMR	2F		89	2.8	0.16
081195	1215	SQMR	2F		94	1.0<	0.08<

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APPENDIX II

TABLE 1 : STANDARDS FOR THE FIVE RIVER ECOSYSTEM USE CLASSES

Use Class	DO % sat 10%ile	BOD (ATU) mg/l 90%ile	Total Ammonia mgN/l 95%ile	Un-ionised Ammonia mgN/l 95%ile	pH 5%ile & 95%ile	Hardness mg/l CaCO ₃	Dissolved Copper µg/l 95%ile	Total Zinc µg/l 95%ile	Class Description
1	80	2.5	0.25	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 200 300 500	Water of very good quality suitable for all fish species
2	70	4.0	0.6	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	30 200 300 500	Water of good quality suitable for all fish species
3	60	6.0	1.3	0.021	6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for high class coarse fish populations
4	50	8.0	2.5		6.0 - 9.0	≤ 10 > 10 and ≤ 50 > 50 and ≤ 100 > 100	5 22 40 112	300 700 1000 2000	Water of fair quality suitable for coarse fish populations
5	20	15.0	9.0						Water of poor quality which is likely to limit coarse fish populations

