

**ENVIRONMENTAL DEPARTMENT  
CORNWALL AREA**



**NRA**

**FINAL DRAFT REPORT**

**MILLENDREATH STREAM  
EC BATHING WATERS  
BACTERIAL CONTAMINATION  
INVESTIGATION 1995**

**March 1996**

**COR/96/001**

**Author: Mark Walton  
Investigations Technician**

*National Rivers Authority  
South Western Region*

**Rob Robinson  
Area Manager**

614.77  
NAT

Millendreath Stream - EC Bathing Waters Failure.  
Bacterial Contamination Investigation, 1995.

Introduction.

(i) Background.

Millendreath Beach was found to fail EC Bathing Water Directive mandatory standards in 1989. In addition single samples exceeded the standards in 1988 and 1994 but did not cause an overall failure. It was considered that the present discharge from Millendreath Holiday Village STW was causing a risk of failure and during discussions with the site owners, Millendreath Holiday Village, the Millendreath Stream upstream of the STW was also identified as a possible source of contamination.

(ii) Objective.

To assess the extent, and identify possible sources, of bacterial contamination of the Millendreath Stream and its tributaries (Figure 1).

2. Methods.

(i) Review of archive data.

(ii) Water samples were taken for bacterial analysis on a regular basis between 10-Aug-95 and 20-Nov-95. Sources of possible contamination were noted and sampled directly where possible. Where direct sampling was not possible, e.g. due to low or irregular flow, the impact of discharges or tributaries was assessed from upstream and downstream samples. Samples were analysed for faecal streptococci (FS), total coliforms (TC) and faecal coliforms (FC) by Truro Public Health Laboratory at Treliske.

There are no bacterial standards for surface freshwater other than for abstraction purposes so, for the purposes of this report, EC Bathing Water Standards are used as markers.

(iii) Where possible, during the bathing water season, surveys of the Millendreath Stream were scheduled to coincide with the routine sampling of bathing water at Millendreath.

3. Results.

Results from all sites sampled are presented in Table 1, whilst sites on the Millendreath Stream only are summarized in Figure 3.

4. Discussion.

In the course of the investigation it became apparent that the Millendreath Stream is culverted in its lower reach, commencing at site 7, upstream of Millendreath Holiday Village STW. The culvert discharges to the sea just above the low water mark on Millendreath Beach, alongside effluent from the Millendreath Holiday Village STW (Plate 1). As a consequence the beach stream is little more than residual land drainage and is not continuous with the Millendreath Stream (see Figure 1).

This beach stream, site 2, has been a routine sampling point (ECBR0460 - Millendreath Stream A) until now, in the belief that it was the major freshwater input. It was data from this site showing high levels of bacterial contamination, and the misapprehension that this site was continuous with the rest of the catchment, that formed the basis of the recommendation in the 1995 desk study for detailed investigation of the Millendreath Stream.

As the culvert discharge is only accessible for sampling on low water springs, the downstream sampling point on most occasions was at site 7 prior to the culvert. After preliminary surveys site 26, downstream of the road at Churchbridge, was identified as a 'clean' upstream control. Subsequent surveys attempted to identify possible sources of contamination between these points. (See Figure 2).

On each sampling occasion the Millendreath Stream showed evidence of bacterial contamination, exceeding the guideline bathing water standards for FS, TC and FC. (Table 1)



The caravan site at Chubbs Mill appears to make a number of unconsented discharges directly to the stream. Several of these appear to originate from the fixed site caravans although none were found to be running. A toilet block also discharges directly into the stream (Plate 2). Again this was never seen to be running but there was evidence of sewage fungus at the point of discharge.

Further upstream The Spinney, a private residence, was found to be making an unconsented discharge directly to the stream. This was sampled on a number of occasions (site 17) and found to be heavily contaminated (Table 1). Sewage fungus and sanitary debris were evident at the site and sampling showed an impact on water quality downstream of the discharge (Figure 3, Table 1).

Sampling results indicated that further contamination continued between site 17 and the 'control' site 26. Three intensive surveys of this upper reach between The Spinney and Churchabridge confirmed that some contamination occurred within this reach although no source could be identified (Figure 3).

During 1995 problems with the breaking out of soakaway effluent from the STW at Looe Valley Holiday Village had also caused concern about a possible impact on water quality in the Millendreath Stream. As a result of these concerns the breakout and the diverted Looe Valley Stream (sites 28 and 29) were also sampled on a number of occasions. Whilst both showed evidence of contamination (Table 1) the location and scale of the problem make it unlikely that they will have a significant impact on water quality in the Millendreath Stream.

## 5. Conclusions.

- (i) There is a bacterial contamination problem in the Millendreath Stream. This contamination may be contributing to the risk of failure of EC Bathing Water Standards at Millendreath Beach.
- (ii) The Millendreath Stream was found to be culverted in its lower reach. The main stream discharges into the sea via the culvert, whilst the stream that crosses the beach is residual drainage from the end of the valley and is unrelated to the main water course. This beach stream also shows evidence of bacterial contamination for which no source has been identified.
- (iii) Chubbs Mill caravan site appears to be making several unconsented discharges of waste water, including untreated sewage, directly to the Millendreath Stream.
- (iv) The Spinney private residence was found to be making an unconsented discharge of sewage effluent directly to the Millendreath Stream.
- (v) Some bacterial contamination occurs between sites 17 and 26. Whilst the source of this could not be confirmed it may be due to seepage from the soakaway associated with the residences at Churchabridge.

## 6. Actions.

- (i) A new bathing waters monitoring site to be included, in addition to ECBR0460, on the Millendreath Stream prior to the culvert (SX 2687 5454).  
Action: Richard Walmsley.
- (ii) Discharges from Chubbs Mill and The Spinney to be investigated by Water Quality.  
Action: Dave Trewolla.
- (iii) Repeated survey of Millendreath Stream during 1996 bathing season to assess impact of actions and to further investigate any continuing contamination downstream of Churchabridge.  
The continuing contamination of the beach stream should also be investigated and the source of the contamination identified.  
Action: Tim Geatches.

Figure 1. The Millendreath Stream.

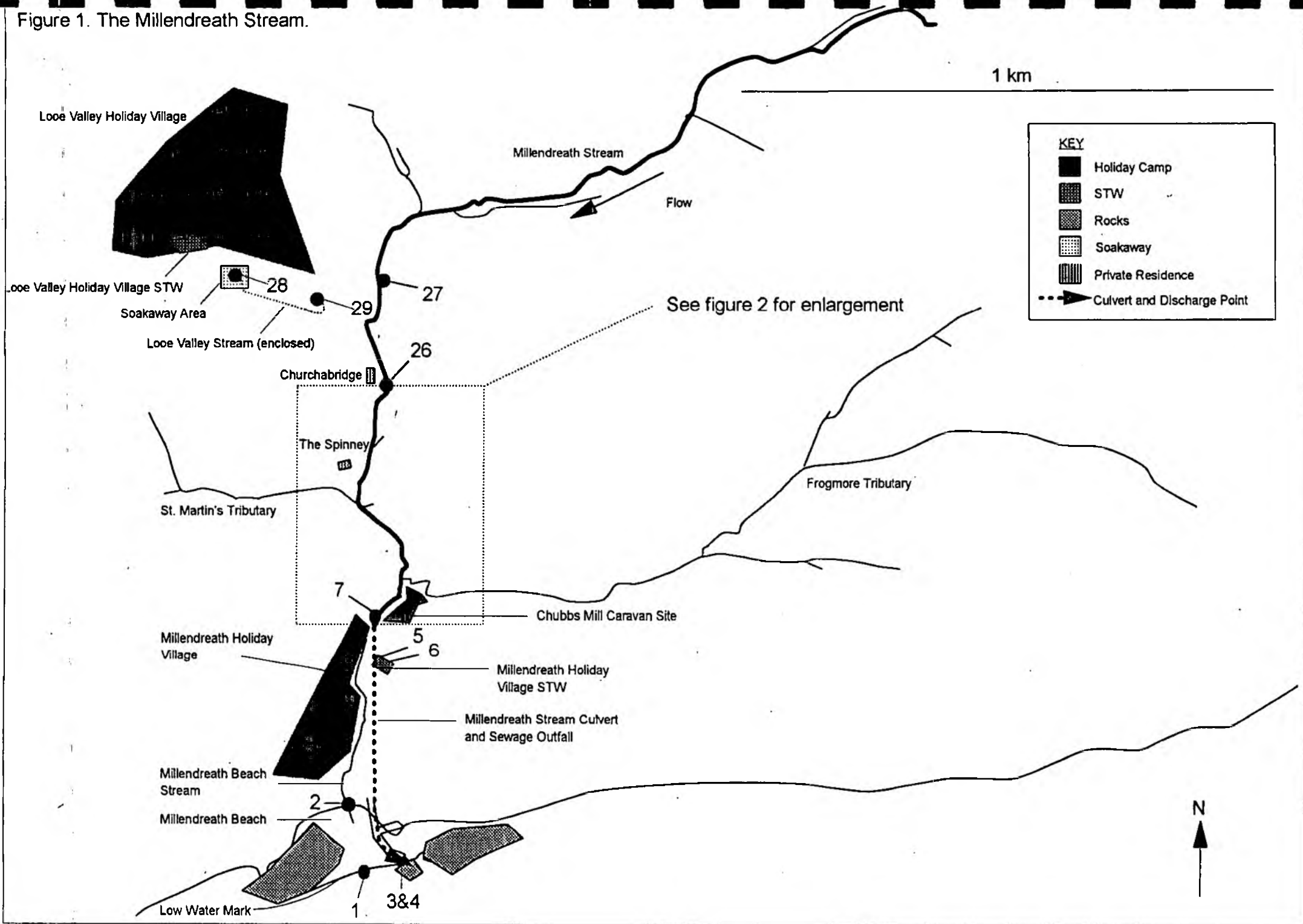


Figure 2.

Millendreath Stream enlarged from Fig.1 showing sampling points. Inset graphs show log bacterial numbers for three sites on four selected dates.

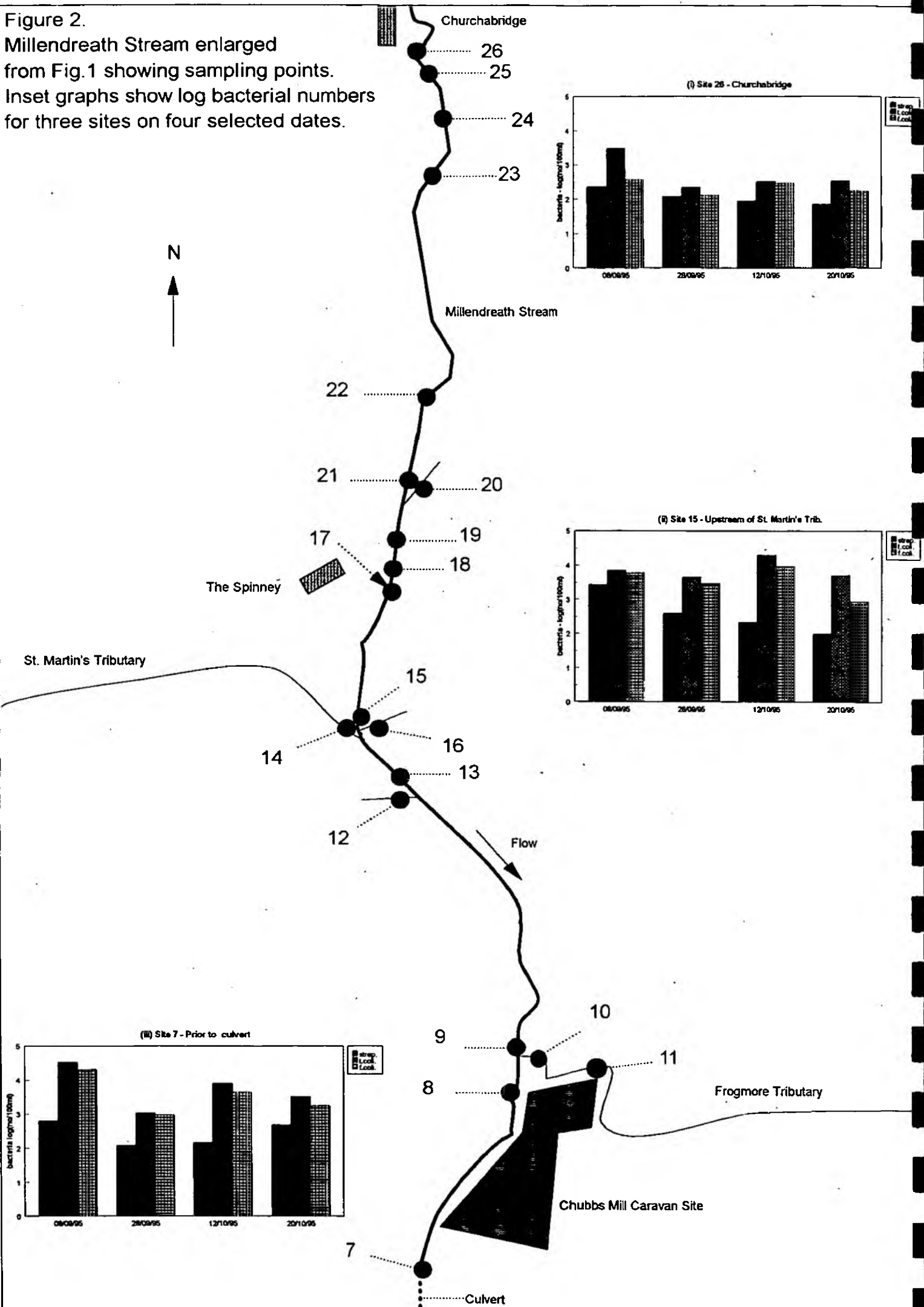
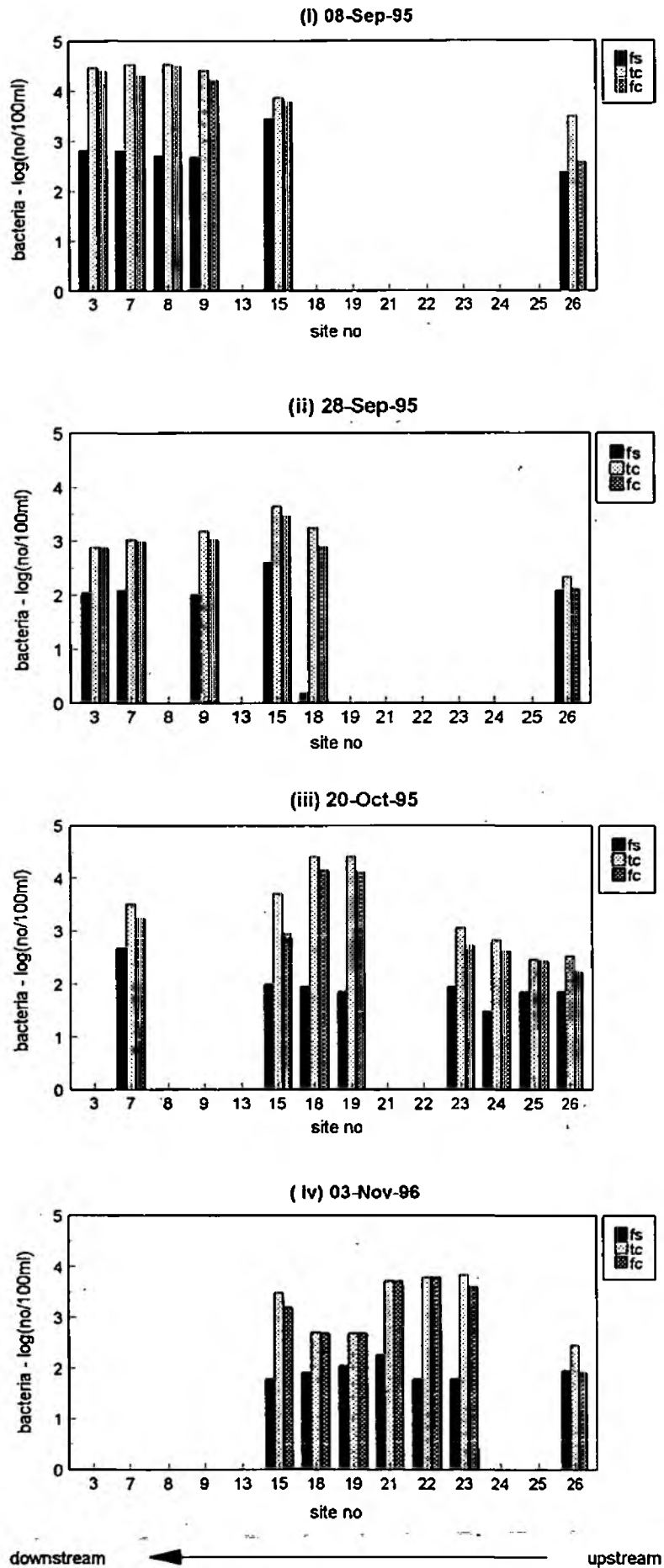


Figure 3.  
 Log bacterial numbers for sites  
 on the Millendreath Stream on  
 four selected dates.



(I) Faecal Streptococci - no/100ml EC Bathing Water Standards (no / 100ml): Imperative = -, Guideline = 100.

Site no	Description	10-Aug-95	18-Aug-95	24-Aug-95	31-Aug-95	08-Sep-95	14-Sep-95	22-Sep-95	28-Sep-95	05-Oct-95	12-Oct-95	20-Oct-95	03-Nov-95	20-Nov-95
1	Bathing water		560				200		<1	<1	300			
2	Beach stream A		110	110	360		2300		300	430	10000	240		
3	MS culvert outfall					640			110					
4	STW outfall					>600000			27000					
5	STW tank A		219000	64000	54000	250000	40000	180000	129000	92000				
6	STW tank B					<600000	200000	510000	190000	210000				
7	MS prior to culvert	930	4800	770	1920	630	960	250	120	350	150	480		
8	MS w/s Chubbs Mill					500								
9	MS w/s Frogmore trib.				660	480	640	120	100	440	450			
10	Frogmore trib. prior to MS					480	30000	130	210	80	90			
11	Frogmore trib. at road				1440	420		180	170	90	540			
12	Wood spring						<1							
13	MS w/s wood spring						580							
14	St. Martin trib. prior to MS					200								
15	MS w/s St. Martin trib.					2700	440	280	400	380	220	100	60	
16	Spring opposite St. Martin trib.							80						
17	The Spinny discharge								300000	2100000			1700000	
18	MS w/s The Spinny discharge								150	250	130	90	80	20
19	MS 10m w/s point 14											70	110	
20	Spring Stream												40	<1
21	MS w/s Spring Stream												180	70
22	MS d/s lark												60	60
23	MS d/s 'footbridge'											90	60	90
24	MS at garden wall											30	50	50
25	MS d/s pool											70	20	20
26	MS at Churchbridge	140	340	<1	130	230	520	200	120	220	90	70	90	500
27	MS w/s fish pond	180	110	210										
28	Looe Valley STW breakout								5000	500	1200			
29	Looe Valley Stream pipe exit										940			

(II) Total Coliforms - no/100ml EC Bathing Water Standards (no/100ml): Imperative = 10,000, Guideline = 100.

Site no	Description	10-Aug-95	18-Aug-95	24-Aug-95	31-Aug-95	08-Sep-95	14-Sep-95	22-Sep-95	28-Sep-95	05-Oct-95	12-Oct-95	20-Oct-95	03-Nov-95	20-Nov-95
1	Bathing water		15200				4900		130	140	800			
2	Beach stream A		190	660	7200		27000		560	490	600000	2400		
3	MS culvert outfall					29000			760					
4	STW outfall					<600000			720000					
5	STW tank A		7200000	2400000	1020000	480000	2500000	7400000	5200000	2400000				
6	STW tank B					<600000	18000000	22000000	5600000	2400000				
7	MS prior to culvert	14000	33000	43000	68000	33000	3400	2200	1040	3200	8000	3200		
8	MS w/s Chubbs Mill					33000								
9	MS w/s Frogmore trib.				46000	25000	1300	2800	1520	2000	12000			
10	Frogmore trib. prior to MS					3500	110000	170	220	120	260			
11	Frogmore trib. at road				250	210		640	320	80	460			
12	Wood spring						<1							
13	MS w/s wood spring						2000							
14	St. Martin trib. prior to MS					70								
15	MS w/s St. Martin trib.					7000	2300	5200	4400	3100	19600	5000	3000	
16	Spring opposite St. Martin trib.							60						
17	The Spinny discharge								22000000	8700000			30000000	
18	MS w/s The Spinny discharge								1760	2200	12000	26000	500	420
19	MS 10m w/s point 14											25000	480	
20	Spring Stream												3000	10
21	MS w/s Spring Stream												5200	360
22	MS d/s lark												6000	440
23	MS d/s 'footbridge'											1140	6800	360
24	MS at garden wall											660	360	360
25	MS d/s pool											290	100	100
26	MS at Churchbridge	110	80	40	320	3000	880	400	220	130	320	340	280	100
27	MS w/s fish pond	230	340	270										
28	Looe Valley STW breakout								12000	7400	5400			
29	Looe Valley Stream pipe exit										9400			

(III) Faecal Coliforms - no/100ml EC Bathing Water Standards (no/100ml): Imperative = 2,000, Guideline = 100.

Site no	Description	10-Aug-95	18-Aug-95	24-Aug-95	31-Aug-95	08-Sep-95	14-Sep-95	22-Sep-95	28-Sep-95	05-Oct-95	12-Oct-95	20-Oct-95	03-Nov-95	20-Nov-95
1	Bathing water		28000				1100		60	20	640			
2	Beach stream A		360	430	330		4000		400	280	360000	570		
3	MS culvert outfall					24000			720					
4	STW outfall					<600000			480000					
5	STW tank A		>999999	760000	720000	360000	1600000	7200000	1000000	850000				
6	STW tank B					<600000	2000000	6600000	2800000	1100000				
7	MS prior to culvert	24000	35000	20000	49000	20000	2400	2000	960	1500	4300	1700		
8	MS w/s Chubbs Mill					31000								
9	MS w/s Frogmore trib.				20000	16000	750	1660	1040	1700	6400			
10	Frogmore trib. prior to MS					350	100000	150	180	90	240			
11	Frogmore trib. at road				200	190		260	260	90	340			
12	Wood spring						<1							
13	MS w/s wood spring						1090							
14	St. Martin trib. prior to MS					70								
15	MS w/s St. Martin trib.					5900	1040	4500	2900	2200	9200	880	1600	
16	Spring opposite St. Martin trib.							40						
17	The Spinny discharge								6000000	4900000			16000000	
18	MS w/s The Spinny discharge								760	1120	3200	14000	480	400
19	MS 10m w/s point 14											13000	480	
20	Spring Stream												2000	<1
21	MS w/s Spring Stream												5200	400
22	MS d/s lark												6000	300
23	MS d/s 'footbridge'											530	4000	300
24	MS at garden wall											420	280	280
25	MS d/s pool											270	60	60
26	MS at Churchbridge	230	260	60	190	370	730	210	130	120	280	170	80	70
27	MS w/s fish pond	640	380	70										
28	Looe Valley STW breakout								3200	2300	1900			
29	Looe Valley Stream pipe exit										3400			

Table 1. Bacterial numbers in Millendreath Stream including tributaries and contributing discharges.



Plate 1. Point of suspected untreated discharge from Chubbs Mill caravan site toilet block.



Plate 2. The Millendreath Stream culvert discharge onto Millendreath Beach at low water.