

**DEVON AREA  
INTERNAL REPORT**



**ENVIRONMENT  
AGENCY**

**SMUGGLERS LANE  
PUMPING STATION,  
HOLCOMBE: FREQUENCY  
OF EMERGENCY  
DISCHARGES**

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119



ENVIRONMENT AGENCY

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**SMUGGLERS LANE PUMPING STATION, HOLCOMBE:  
FREQUENCY OF EMERGENCY DISCHARGES**

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## SMUGGLERS LANE PUMPING STATION, HOLCOMBE: FREQUENCY OF EMERGENCY DISCHARGES

*This document is based on data held in the Monitoring and Data office, not all of which is necessarily reproduced below. Original files are stored at [\\SWEXM\\_GO2\DATA\GROUPS\Investigations Team\Bathing Beaches 2002\Holcombe 2002.doc](\\SWEXM_GO2\DATA\GROUPS\Investigations Team\Bathing Beaches 2002\Holcombe 2002.doc). Please see a member of the Monitoring and Data Team if you wish to access these.*

*All times are Greenwich Mean Time.*

### 1.0 INTRODUCTION

Holcombe is a coastal village situated between Dawlish and Teignmouth. The adjacent bathing water is Designated.

Sewage arising in Holcombe is transferred via a pumping station in Smugglers Lane to South West Water's treatment works at Timaru Gardens, Dawlish Warren. The pumping station has both storm and emergency overflow facilities from which discharges are made to the sea via a pipe that runs under Smugglers Lane. The pumping station emergency overflow (PSEO) is consented (Consent Number 201581). The consent for the storm sewage overflow (SSO) (Consent Number NRA-SW-1286) was revoked on 22/06/01.

Principal flows to the pumping station are regulated by an attenuation tank (125m to the North West) which also has an emergency overflow (EO). The pumping station receives local sewage flows in addition to those from the attenuation tank.

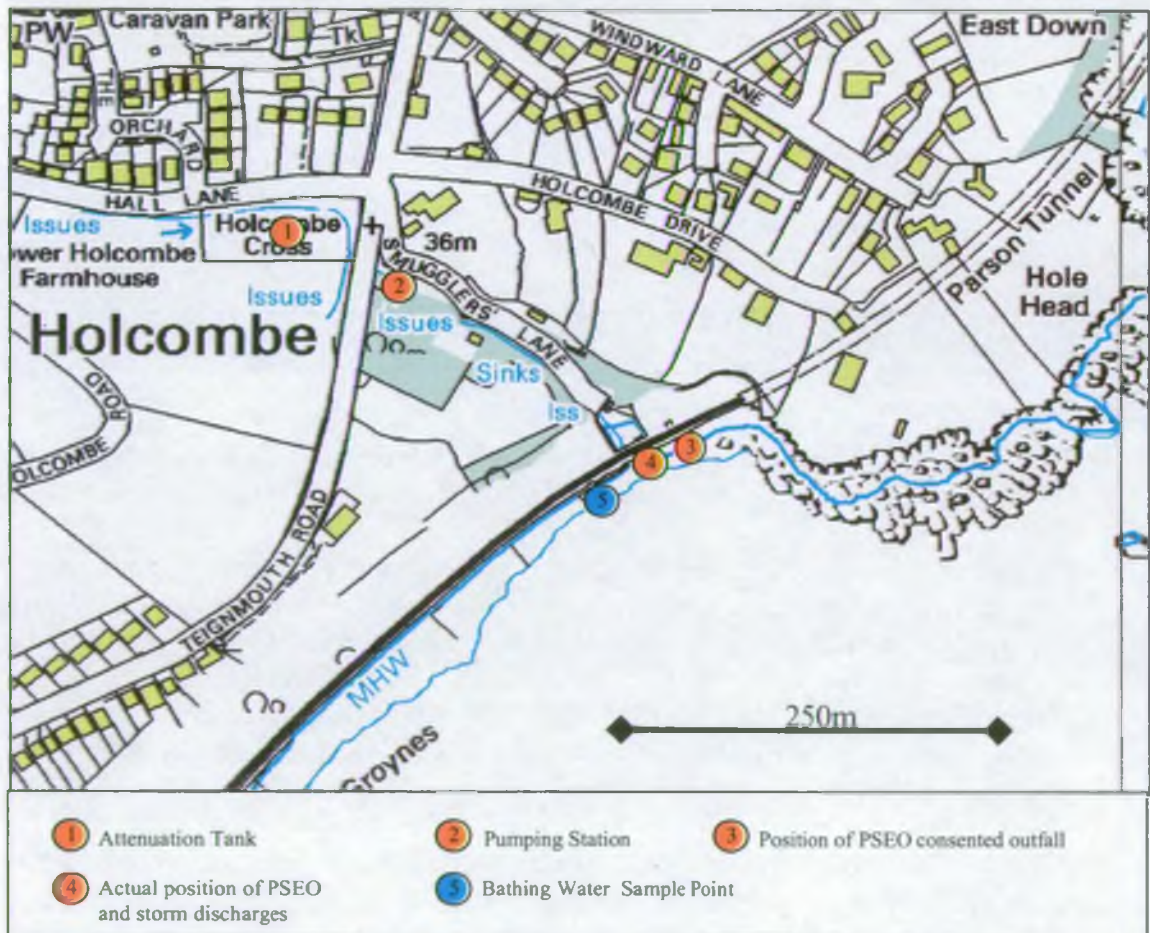
The Agency's Environment Officer requested the monitoring of emergency discharges from both the pumping station and attenuation tank following concerns that the pumping station facility was discharging too frequently. Emergency discharges pose a risk to bathing water quality.



Both bathing and surface water quality in the vicinity of Smugglers Lane have been the subject of previous work by the Agency (References 1, 2a, 2b). As a result a number of improvements to the sewerage infrastructure of the pumping station have been carried out.

**2.0 SITE DESCRIPTION**

The positions of the pumping station, attenuation tank and the bathing water are shown in Figure 1.



**FIGURE 1. Location of sites referred to in text.**

The pumping station is situated at NGR SX 95500 74773 on a steep slope between the A379 Teignmouth Road and the beach. The emergency overflow is accessed via an inspection chamber immediately outside the pumping station building (**Photograph 1**). Emergency discharges are consented for release to the sea at NGR SX 95700 74650, some 75m NE of the bathing water sample point. Storm discharges, which are unconsented, should be made to the same point. However, the discharge pipe has been fractured so that the actual point of discharge is immediately on the seaward side of the railway bridge (NGR SX 95675 74640). This brings the discharge to within 30m of the bathing water sample point and allows discharges to mix with water from the Holcombe Stream as it flows across the beach.

The attenuation tank uses a *Hydroslide* to regulate flows delivered to the pumping station. Excess flow is stored on site. The tank incorporates a weir allowing emergency discharges to be made should retained flows exceed tank capacity.

The Holcombe Stream (previously the subject of an Agency investigation into bathing water quality at Holcombe (**Reference 2b**)), which originates inland of Holcombe village, runs alongside Smugglers Lane before emptying onto the beach head. The investigation referred to above found livestock access upstream of Holcombe to be a principal source of bacterial contamination of the stream. Subsequent remedial work involving the provision of fencing to prevent livestock ingress appears to have reduced bacterial contamination<sup>1</sup>.

### 3.0 METHOD

Flow and event logging equipment was used to determine the frequency and duration of emergency discharges from both Smugglers Lane pumping station, Holcombe (**Photograph 2**) and from the nearby attenuation tank. Rainfall data was collected for the duration of the project at South West Water's Timaru Gardens treatment works, Dawlish Warren, 3.3km to the NNW (**Photograph 3**). Data from the three sites were compared to quantify the influence of the attenuation tank on operation of the pumping station, the role of rainfall and the frequency of discharges in relation to consent conditions.

<sup>1</sup> Mean faecal coliform concentrations 1992-2001: 20657 No.100ml<sup>-1</sup>; 2002: 10346 No.100 ml<sup>-1</sup>

## 4.0 RESULTS AND DISCUSSION

Monitoring equipment was deployed for approximately 5 months as follows:

Date	Site	Action
29/05/02	Attenuation tank	Event logging device ( <i>Stormlog</i> ) installed
	PSEO	Flow logging device ( <i>Flowlog</i> ) installed
06/06/02	Timaru Gardens WWTW	Rain gauge ( <i>Rainlog</i> ) installed
10/07/02	PSEO	Flow logging device ( <i>Flowlog</i> ) replaced with event logging device ( <i>Stormlog</i> )
11/11/02	Attenuation tank	Event logging device ( <i>Stormlog</i> ) removed
22/11/02	PSEO	Event logging device ( <i>Stormlog</i> ) removed
26/11/02	Timaru Gardens WWTW	Rain gauge ( <i>Rainlog</i> ) removed

The equipment was downloaded on a circa monthly basis. Data is reported as daily totals measured from midnight to midnight.

Flow/event and rainfall data collected at the three sites given above are shown in **Table 1**.

**Chart 1** shows *flow* data (litres day<sup>-1</sup>) collected at the PSEO together with rainfall and **Chart 2** shows *event* data (minutes day<sup>-1</sup>) collected at the PSEO and rainfall. **Chart 3** is a combination of **Charts 1 and 2** showing all PSEO data as events (minutes day<sup>-1</sup>).

PSEO *flow* data (*Flowlog*) for the period 05/06/02-19/06/02 was lost subsequent to the download on 19/06/02. Two events during this period were noticed at the time of downloading but were not recorded by the *Flowlog*.

When the PSEO equipment was removed on 22/11/02, the transducer – which detects discharge events – had been dislodged. The data in **Table 1** suggest that the

transducer was dislodged on 14/11/02 and, from the discharge patterns shown in **Chart 3**, it seems likely that discharges occurred subsequent to this date but were not logged.

**Table 1** shows that the greatest recorded flow volume was  $51178 \text{ l d}^{-1}$  (02/07/02) (rainfall 18.4 mm). This event lasted 4.3 hours. In terms of discharge duration the greatest daily total was 16.5 hours on 07/11/02 (rainfall 7mm and 8.4mm the previous day). As rainfall for the 02/07/02 and 06-07/11/02 was broadly similar we might expect the 16.5 hour discharge on 07/11/02 to have involved some  $194476 \text{ l d}^{-1}$  ( $194.476 \text{ m}^3 \text{ d}^{-1}$ ).

No discharges were recorded from the attenuation tank EO.

From **Charts 1-3** the following observations may be made:

**CHART 1.** Flow events were coincident with rainfall. The two events for which data were lost (05/06/02-19/06/02) are likely to have been coincident with the rainfall data shown in Chart 1 for the same period.

**CHART 2.** Discharge events were again coincident with rainfall.

**CHART 3.** During high rainfall emergency discharges occur more often than not.

From **Table 1** we can be more specific about the frequency of rainfall:

For the period 19/06/02-14/11/02, where discharge data is complete, there were 22 days on which rainfall was 5mm or greater and discharges were recorded on 19 of these days. This is a frequency of 86%.

The Consent for the PSEO states that discharges may only take place as a result of the following conditions:

- (a) electrical power failure
- (b) mechanical breakdown of the pumps
- (c) rising main failure
- (d) blockage of the downstream sewer

Quite clearly the facility is operating in response to rainfall, not as a result of the conditions given above, and in this regard is functioning more as a storm overflow than an emergency overflow.

The emergency overflow considerably exceeds the guideline standard of three spills per bathing season as recommended in Agency water quality consenting standards (**Reference 3**).



## 5.0 CONCLUSIONS

Emergency discharges from the pumping station are not the result of operation of the attenuation tank EO.

The pumping station is failing to deal adequately with enhanced sewage flows. The cause is unknown but is believed to be a result of local flows direct to the pumping station.

## 6.0 RECOMMENDATIONS

SWWL are required to undertake whatever work is needed to reduce the discharges to 3 spills per bathing season.

## 7.0 REFERENCES

- 1 Internal investigations (unpublished) undertaken during 1999/2000 into the operation of Smugglers Lane PSEO.
- 2(a) An investigation into the reason why Holcombe Beach failed to comply with the E.C. Bathing Waters Directive. Hicks, N. Environment Agency. Internal Report DEV/E/07/96.
- 2(b) Internal investigation (unpublished) undertaken during 1999 into the effect of the Holcombe Stream on bathing water quality.
- 3 Water Quality Consenting Standards – AMP2 Guidelines. Environment Agency  
<http://146.213.80.51/knowledge/Default.asp?ctr=ListBriefs%2Easp>..

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Robin Pearson  
16/01/03

TABLE 1.

SMUGGLERS LANE PSEO/SO AND HOLCOMBE ATTENUATION  
TANK EO: FLOW AND EVENT DATA

Date	Timaru Gardens Rain gauge <i>Rainlog</i>	Attenuation EO <i>Stormlog</i>	PSEO/SO <i>Stormlog</i>	PSEO/SO <i>Flowlog</i>	PSEO/SO <i>Flowlog</i>
	mm d <sup>-1</sup>	min d <sup>-1</sup>	min d <sup>-1</sup>	l d <sup>-1</sup>	min d <sup>-1</sup>
06/06/2002	3.8				
07/06/2002	1.6				
08/06/2002	1				
09/06/2002	7.2				
10/06/2002	0.8				
11/06/2002	3.8				
12/06/2002	0.2				
13/06/2002					
14/06/2002	0.2				
15/06/2002	6.4				
16/06/2002	1				
17/06/2002					
18/06/2002					
19/06/2002					
20/06/2002					
21/06/2002	6				
22/06/2002					
23/06/2002					
24/06/2002					
25/06/2002	0.4				
26/06/2002					
27/06/2002				13	2
28/06/2002				2	2
29/06/2002					
30/06/2002					
01/07/2002	1				
02/07/2002	18.4			51178	138
03/07/2002	4.2			48458	342
04/07/2002	0.8				
05/07/2002	0.4				
06/07/2002					
07/07/2002	0.2				
08/07/2002	11.8			7119	94
09/07/2002	8.2			30795	224
10/07/2002	9.8				
11/07/2002	1.2				
12/07/2002	0.8				
13/07/2002					
14/07/2002					
15/07/2002					
16/07/2002					
17/07/2002					
18/07/2002					
19/07/2002					
20/07/2002					
21/07/2002					
22/07/2002					
23/07/2002					

TABLE 1. (cont.)

SMUGGLERS LANE PSEO/SO AND HOLCOMBE ATTENUATION  
TANK EO: FLOW AND EVENT DATA

Date	Timaru Gardens Rain gauge <i>Rainlog</i> mm d <sup>-1</sup>	Attenuation EO <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <sup>1</sup> <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> l d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> min d <sup>-1</sup>
24/07/2002	0.4				
25/07/2002	0.2				
26/07/2002					
27/07/2002					
28/07/2002					
29/07/2002					
30/07/2002					
31/07/2002	16.2		9		
01/08/2002					
02/08/2002					
03/08/2002	3		12		
04/08/2002	0.8				
05/08/2002	3		16		
06/08/2002					
07/08/2002	16.4				
08/08/2002	4.6				
09/08/2002	3				
10/08/2002					
11/08/2002					
12/08/2002					
13/08/2002					
14/08/2002					
15/08/2002					
16/08/2002					
17/08/2002					
18/08/2002	2.6				
19/08/2002					
20/08/2002					
21/08/2002					
22/08/2002					
23/08/2002	2				
24/08/2002	0.2				
25/08/2002					
26/08/2002					
27/08/2002					
28/08/2002					
29/08/2002					
30/08/2002	1.4				
31/08/2002	0.2				
01/09/2002					
02/09/2002					
03/09/2002	0.8				
04/09/2002	3.6				
05/09/2002	0.2				
06/09/2002	0.4				
07/09/2002	0.8				
08/09/2002	0				
09/09/2002	9.4		28		
10/09/2002	0.4				
11/09/2002	0.2				

TABLE 1. (cont.)

SMUGGLERS LANE PSEO/SO AND HOLCOMBE ATTENUATION  
TANK EO: FLOW AND EVENT DATA

Date	Timaru Gardens Rain gauge <i>Rainlog</i> mm d <sup>-1</sup>	Attenuation EO <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> l d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> min d <sup>-1</sup>
12/09/2002	0		37		
13/09/2002	0				
14/09/2002	0				
15/09/2002	0				
16/09/2002	0				
17/09/2002	0				
18/09/2002	0				
19/09/2002	0				
20/09/2002	3				
21/09/2002	0				
22/09/2002	0				
23/09/2002	0				
24/09/2002	0				
25/09/2002	0				
26/09/2002	0				
27/09/2002	0				
28/09/2002	0				
29/09/2002	0				
30/09/2002	0				
01/10/2002	9				
02/10/2002	0				
03/10/2002	2.6				
04/10/2002	0.2				
05/10/2002	0				
06/10/2002	0				
07/10/2002	0.6				
08/10/2002	0				
09/10/2002	0				
10/10/2002	0				
11/10/2002	0.2		13		
12/10/2002	4.6				
13/10/2002	17.6		781		
14/10/2002	0.6		946		
15/10/2002	24.8		504		
16/10/2002	0.2				
17/10/2002	0				
18/10/2002	1				
19/10/2002	0				
20/10/2002	1.4		24		
21/10/2002	7.2		81		
22/10/2002	10.8		139		
23/10/2002	0.4				
24/10/2002	0.2				
25/10/2002	10.4		90		
26/10/2002	2.4		89		
27/10/2002	12.2		90		
28/10/2002	1.6				
29/10/2002	0				
30/10/2002	0				
31/10/2002	0.8				
01/11/2002	8		101		
02/11/2002	15.4		261		
03/11/2002	4.8		26		
04/11/2002	0.4				

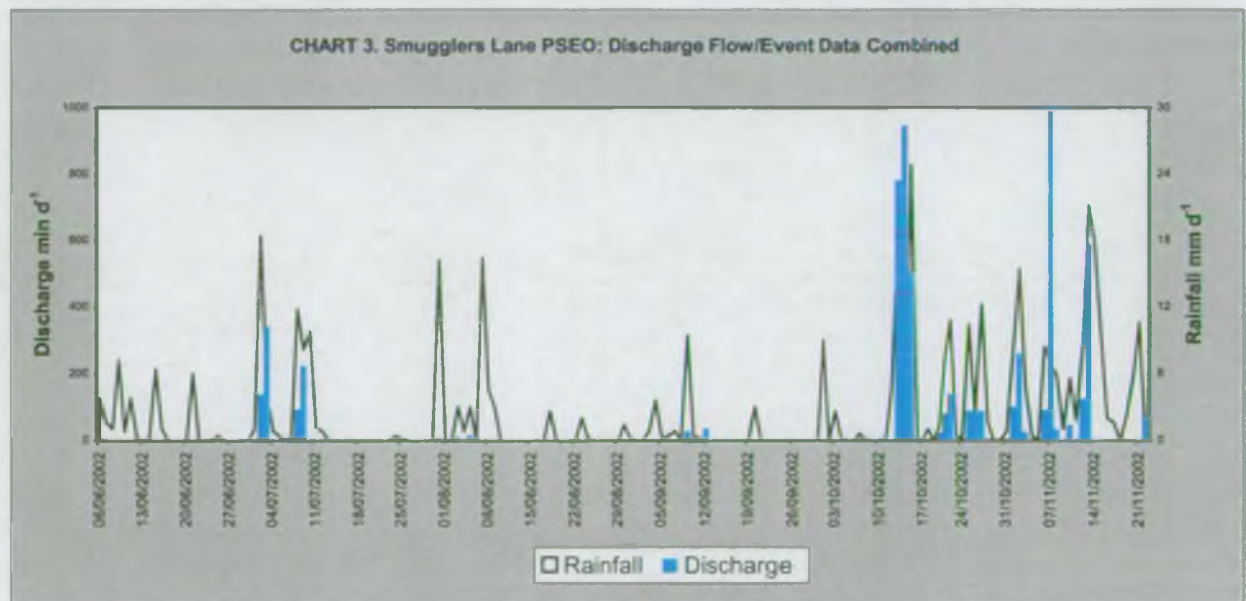
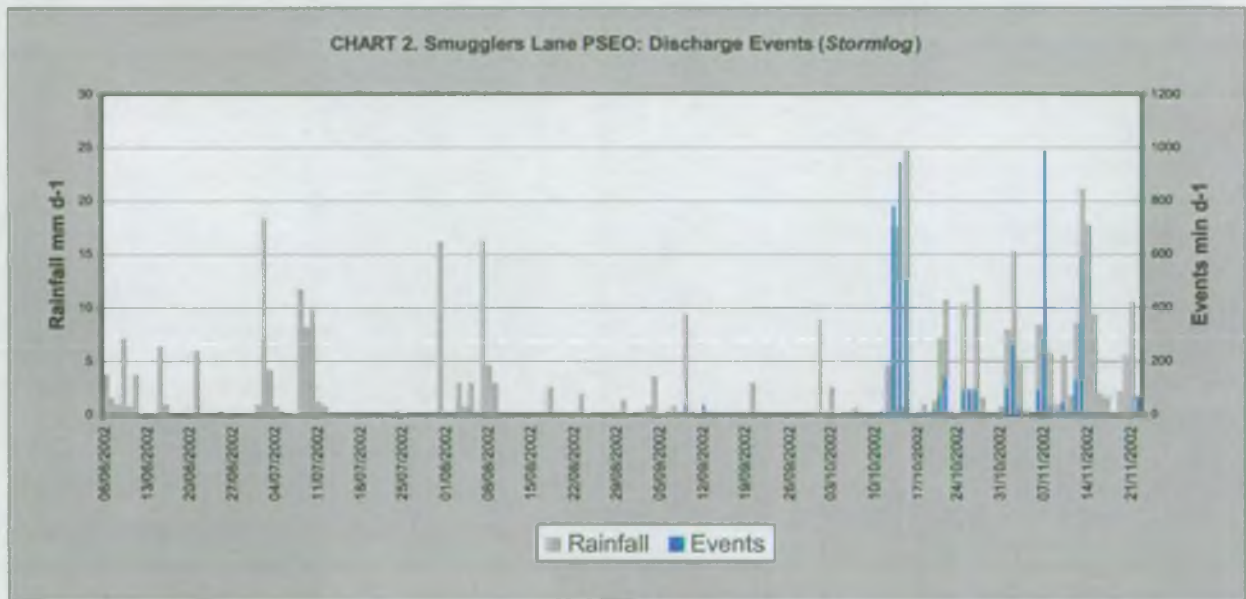
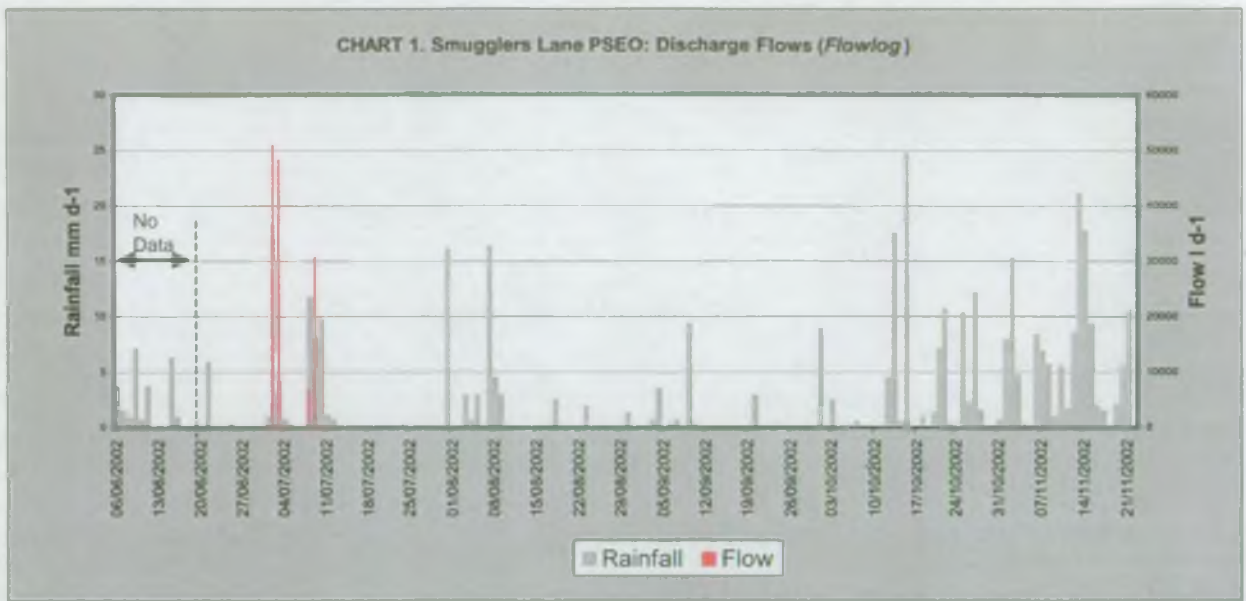
TABLE 1. (cont.)

SMUGGLERS LANE PSEO/SO AND HOLCOMBE ATTENUATION  
TANK EO: FLOW AND EVENT DATA

Date	Timaru Gardens Rain gauge <i>Rainlog</i> mm d <sup>-1</sup>	Attenuation EO <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <i>Stormlog</i> min d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> l d <sup>-1</sup>	PSEO/SO <i>Flowlog</i> min d <sup>-1</sup>
05/11/2002	0				
06/11/2002	8.4		92		
07/11/2002	7		989		
08/11/2002	5.8		34		
09/11/2002	1				
10/11/2002	5.6		46		
11/11/2002	1.8				
12/11/2002	8.6		125		
13/11/2002	21.2		590		
14/11/2002	17.8		4		
15/11/2002	9.4				
16/11/2002	2				
17/11/2002	1.6				
18/11/2002	0				
19/11/2002	2.2				
20/11/2002	5.6				
21/11/2002	10.6		4		
22/11/2002	0		67		

discharge  
pattern  
changes  
from  
14/11/02 -  
suspect  
transducer  
dislodged





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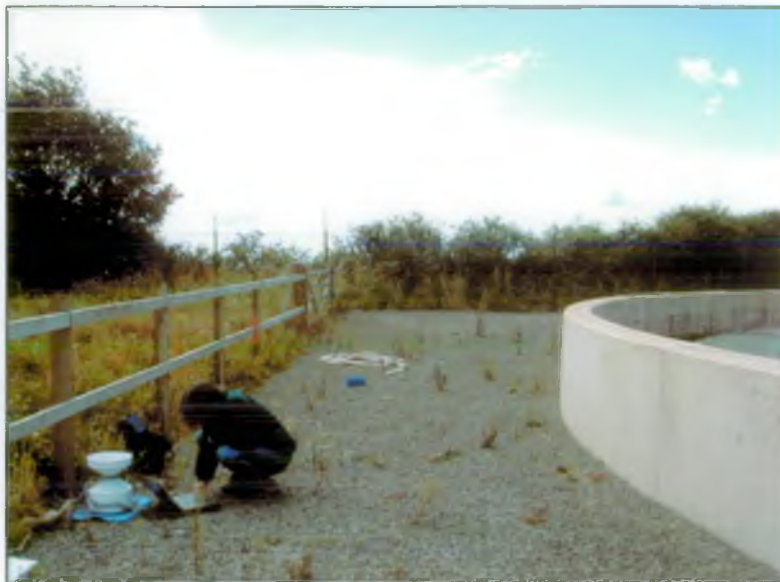
PHOTOGRAPH 1

Smugglers Lane Pumping Station and emergency/storm outfall inspection chamber



PHOTOGRAPH 2

PSEO and monitoring equipment showing discharge taking place



PHOTOGRAPH 3

Rain gauge installed at Timaru Gardens WWTW, Dawlish Warren