

CONSENT NO.

BP0054601

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Asiantaeth yr  
Amgylchedd Cymru  
Environment  
Agency Wales

WATER RESOURCES ACT 1991

**SECTION 88 - SCHEDULE 10**

**(AS AMENDED BY THE ENVIRONMENT ACT 1995)**

**NOTICE OF MODIFICATION OF CONSENT TO DISCHARGE**

**TO: Environment Quality Scientist**  
Dŵr Cymru Cyfyngedig  
Pentwyn Road  
Nelson  
Treharris  
CF46 6LY

Following a review of the conditions of its consent, the **ENVIRONMENT AGENCY** ("The Agency") in pursuance of its powers under the Water Resources Act 1991 **HEREBY MODIFIES ITS CONSENT** to the making of a discharge **OF SEWAGE EFFLUENT**, as follows:

**Tertiary Treated Sewage Effluent**

with respect to Modification of Consent No. BP0054601 issued on the 13th day of January 2003

**FROM: BISHOPSTON SEWAGE TREATMENT WORKS**

**AT: BRANDY COVE LANE, BISHOPSTON, SWANSEA**

**TO: COASTAL WATERS AT BRANDY COVE**

**HEREAFTER SUBJECT TO** the conditions set out in the following schedule(s):

**Tertiary Treated Sewage Effluent**

**Schedule No. BP0054601 01**

Subject to the provisions of Paragraphs 7 and 8 of Schedule 10 of the Water Resources Act 1991, no notice shall be served by the Agency, which alters the effect of modifications made by this notice, without the agreement in writing of the consent holder, during a period of 4 years from the date this notice is served.

Dated this 31<sup>st</sup> day of January 2006

Signed .....  
**Team Leader - Regulatory Water Quality**

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<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>
<b>DATED</b>	<i>3/1/06</i> January, 2006

## CONDITIONS OF CONSENT TO DISCHARGE

**Tertiary Treated Sewage Effluent ("the Discharge")**

**FROM: BISHOPSTON SEWAGE TREATMENT WORKS, BRANDY COVE LANE, BISHOPSTON, SWANSEA**

### NATURE

1. (a) The Discharge shall consist solely of tertiary treated sewage effluent which has been disinfected by means of ultra violet (UV) irradiation. For the purpose of this consent, "disinfection" is defined as the use of a process designed specifically to reduce the number of viable, potentially infectious micro-organisms in the effluent.
- (b) The Discharge shall be disinfected by means of UV irradiation from an artificial source with at least 85% of the available radiation emitted in the wavelength range 250 to 260nm. An applied UV dose of 24mWs/cm<sup>2</sup> (calculated at a UV transmittance of 45%) must be exceeded subject to conditions 1(c) and (d) below.
- (c) The applied UV dose must exceed the limit set out in condition 1(b) for at least 99% of the measurements (as required by condition 14 (b) I. b)) in any period of 12 consecutive months.
- (d) No more than 10% of measurements taken consecutively during any 24 hour period from midnight to midnight should fall below 12mWs/cm<sup>2</sup>.
- (e) The period(s) when the applied UV dose limit is less than the limit set out in condition 1(b) shall not be used by the Consent Holder for the maintenance of the UV plant. Maintenance is defined in the UV Code of Practice attached to this Consent.

### FAILURE OF UV MEASUREMENT SYSTEMS

2. In the event of failure of the flow monitor used in the control of the UV dosing system:
  - (a) the maximum available number of duty banks of UV lamps shall be automatically activated;
  - (b) the minimum applied UV dose at maximum effluent flow rates at a calculated UV transmittance (at 254nm) of 45%, shall not be less than 24mWs/cm<sup>2</sup>.

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

### **LOCATION**

3. The Discharge shall be made in the manner and at the place specified as:
  - (a) discharging via a 225mm diameter pipe;
  - (b) discharging to coastal waters at Brandy Cove;
  - (c) at National Grid Reference SS 58560 87287;
  - (d) shown marked 'Consent Point' on Plan No.BP0054601 attached as Annex 3.

### **SAMPLE POINT**

4. An appropriately labelled sample point shall be provided and maintained at National Grid Reference SS 58210 87890 as shown marked 'Sampling Point (Post-UV)' on Plan No. BP0054601, or some other point as agreed in writing with the Agency, so that a representative sample of the Discharge may be obtained. The Consent Holder shall ensure that all constituents of the Discharge pass through the said sampling point at all times and in any legal proceedings it shall, for the purposes of Section 10 of the Rivers (Prevention of Pollution) Act 1961, be presumed, until the contrary is shown that any sample of the Discharge taken at the said sampling point is a sample of what was discharging into controlled waters.

### **VOLUME**

5. The volume of the Discharge shall not exceed 2,813 cubic metres per day.
6. The Dry Weather Flow of the Discharge shall not exceed 1,406 cubic metres per day.

For the purpose of this condition Dry Weather Flow shall mean the average daily flow to the treatment works during seven consecutive days without rain (excluding a period which includes public holidays) following seven days during which the rainfall did not exceed 0.25 millimetres on any one day.

7. The rate of discharge shall not exceed 33 litres per second.
8.
  - (a) A continuous flow monitoring and recording system, to a specification provided by the Agency, with on-site visual display from which readings can be readily obtained by the Agency, shall be provided and operated to record the daily volume and instantaneous flow of the discharge.
  - (b) As soon as practicable after completion of the flow system installation the Consent Holder shall employ an independent expert to certify that the installation complies with the Agency's specification. The Consent Holder shall satisfy himself as to the professional competence of the expert. A copy of the certifier's report shall be provided to the Agency when it is available.

CONSENT NO.	BP0054601
SCHEDULE NO.	BP0054601 01

- (c) Records of the flow readings shall be maintained by the Consent Holder and shall be provided to the Agency when requested, in a format specified by the Agency.
- (d) The Consent Holder shall produce and maintain a quality control manual, approved by the independent expert and to the satisfaction of the Agency, specifying procedures for the calibration, operation and maintenance of the flow monitoring system. The flow system shall be calibrated, operated and maintained by the Consent Holder in accordance with the provisions of the manual. The Consent Holder shall keep a record of these procedures available for inspection by the Agency and provide a copy to the Agency on request.
- (e) The Consent Holder shall record all failures of the continuous flow system and any other breaks in the flow record. The reasons for these failures and breaks shall be recorded and all steps taken to prevent a re-occurrence. The Consent Holder shall ensure that as far as possible the recorder remains fully operational at all times. Any failures shall be remedied as soon as possible.
- (f) Flows of the discharge shall be measured at the UV disinfection plant flow monitor National Grid Reference SS 58200 87896, or such other point(s) as is agreed by the Agency.

## COMPOSITION

- 9. (a) Subject to paragraph (b) below, the Discharge shall not contain more than:
    - (i) 50 milligrammes per litre of biochemical oxygen demand (measured after 5 days at 20°C with nitrification suppressed by the addition of allyl-thiourea);
    - (ii) 60 milligrammes per litre of suspended solids (measured after drying at 105°C).
  - (b) The limit for any of the relevant parameters set out in paragraph 9(a) above may be exceeded where, in any series of samples of the Discharge taken at regular but randomised intervals in any period of twelve consecutive months as listed in Column 1 of the 'Look-up table' attached as Annex 1 to this consent, no more than the relevant number of samples, as listed in Column 2 of the said table, exceed the applicable limit for that relevant parameter.
10. The Discharge shall not contain more than:
- (a) 100 milligrammes per litre of biochemical oxygen demand (measured after 5 days at 20°C with nitrification suppressed by the addition of allyl-thiourea);
  - (b) 250 milligrammes per litre of suspended solids (measured after drying at 105°C).

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

## **WORKS OPERATION**

11. The works shall be operated and the effluent shall be treated in a manner which, so far as reasonably practicable, minimises the polluting effects of the Discharge made from the works on controlled waters.

This condition does not require -

- (a) any higher standard to be achieved in relation to any characteristic of the Discharge which is specifically regulated by condition 9 and 10 than is required by that condition;
- (b) any alteration of the works or a change in the type of treatment used.

## **MAINTENANCE**

12. The works shall be operated and maintained in accordance with good operational practice such that:

- (a) it remains fully operational except at times of unavoidable mechanical or electrical breakdown which shall be attended to, and the Agency informed of the failure, as soon as practicable after the failure;
- (b) following a failure all equipment shall be returned to normal operation as soon as practicable;
- (c) tanks shall be desludged at sufficient frequency and in such a manner to prevent excessive carryover of suspended solids.

## **UNUSUAL WEATHER CONDITIONS**

13. (a) No sample of the discharge, taken at a time when unusual weather conditions are adversely affecting the operation of the sewage treatment works, shall be taken into account in deciding whether or not the conditions contained in paragraphs 9, 10 and 11 of this consent have been complied with.
- (b) For the purpose of this condition "unusual weather conditions" shall include:
- (i) low ambient temperatures as evidenced by effluent temperatures of 5°C or less, or by the freezing of mechanical equipment in the works;
  - (ii) significant snow deposits;
  - (iii) tidal or fluvial flooding;

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

- (iv) weather conditions causing unforeseen loss of power supply to the sewage treatment which could not be ameliorated by the reasonable provision and operation of standby generation facilities.
- (c) On any occasion where unusual weather conditions adversely affect the operation of the sewage treatment works, the consent holder shall use its best endeavours to mitigate that adverse effect.
- (d) For a sample of the discharge to be considered for the purposes of (a) above, the consent holder shall notify the Agency by telefax or telephone as soon as unusual weather conditions are known to have adversely affected operations and shall confirm the circumstances in writing as soon as possible thereafter (and in any event within 14 days of the occurrence of such conditions). That notification shall include a full description of the unusual weather conditions and their impact on the operation of the works.

## **RECORDING AND REPORTING**

### **14. (a) Maintenance Programme**

- I. The consent holder shall establish and operate a documented maintenance programme including the method and frequency of cleaning and replacement of UV lamps, and flow meters, and record all non-routine actions undertaken that may have adversely affected effluent quality. Details of the maintenance programme shall be provided to the Agency for agreement. Copies of the programme shall be made available for inspection by the Agency's officers at all reasonable times.
- II. The Consent Holder shall keep records of the maintenance undertaken (both routine and non-routine). Copies of these records shall be maintained by the Consent Holder and kept available for inspection by the Agency's officers at all reasonable times.
- III. On request the consent holder shall supply the Agency with a written report on the maintenance and all non-routine actions that may have adversely affected effluent quality.

### **(b) UV Process Monitoring and Reporting**

- I. Continuous recorders, with on-site visual display from which readings may be readily obtained, shall be provided and maintained by the Consent Holder enabling the following to be measured and recorded at 15 minute intervals:
  - a) the instantaneous flow rate through each UV irradiation channel;
  - b) the instantaneous applied UV dose for each UV irradiation channel;
  - c) any other parameters used in calculating the UV dose.

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

- II. Copies of the records shall be maintained by the Consent Holder for a minimum of 2 years or such longer time as the Agency may from time to time specify and be kept at a nominated place available for inspection by the Agency's officers at all reasonable times.
- III. The Consent Holder shall supply to the Agency, two months in arrears, in a format specified by the Agency, on a three monthly basis, the records of the readings specified in condition 14(b) I.

**(c) Exception Reports**

The Consent Holder shall supply to the Agency at three monthly intervals, or upon request, a written report, detailing all occurrences where:

- I. there were any failures of any measurement system used to control the UV dosing system;
- II. the external power supply to the UV disinfection system was interrupted;
- III. a Discharge of sewage effluent was made which had not been subjected to the required UV dose as specified in conditions 1(d) and 2 of this consent.
- IV. The report shall detail the reasons why the situation occurred, and the actions taken by the Consent Holder. The report shall include an assessment of what measures can be adopted in the future to minimise such occurrences.
- V. The Agency, if satisfied that the cause is an emergency and outside the control of the Consent Holder, and that all possible measures were taken to minimise the impact of the discharge on controlled waters, shall exclude the measurements for the period for compliance purposes with condition 1(d).

**(d) Disinfection Efficacy Monitoring**

The Consent Holder shall carry out the monitoring programme as detailed below, unless otherwise notified in writing by the Agency. The results of the monitoring programme are to be supplied to the Agency in a format specified by the Agency, on a three monthly basis, two months in arrears.

- I. Sample points as shown on attached plan:
  - A Crude influent to sewage treatment works at NGR SS 58172 87938.
  - B Biologically/secondary treated sewage effluent before UV disinfection at NGR SS 58200 87900.
  - C Biologically/secondary treated sewage effluent after UV disinfection at NGR SS 58210 87890.

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

II. Microbiological determinands and frequencies (Agency Standard Analytical Methods to be employed, including AQC):

- 1) **Faecal Coliforms** - fortnightly at sample points A, B and C;
- 2) **Total Coliforms** - fortnightly, at sample points A, B and C;
- 3) **Faecal Streptococci** - fortnightly, at sample points A, B and C;
- 4) **Salmonella** - fortnightly, at sample points B and C;
- 5) **Representative enteroviruses** - fortnightly, at sample points B and C;
- 6) **F-specific bacteriophage** - fortnightly, at sample points A, B and C.

Following two consecutive years of full consent compliance, the Agency will review the data annually and notify in writing the Consent Holder of any resulting change to the monitoring regime.

III. Other determinands and frequencies

The measurement of all determinands below shall coincide with the measurement of microbial determinands. At each sample point, samples for analysis should be sub-sampled from a single bulk sample. Where this cannot be achieved, the sampling regime shall be clearly recorded.

- a) The flow through each UV irradiation channel shall be measured.
  - b) The applied dose shall be recorded in each UV irradiation channel.
  - c) The measured UV transmittance at 254nm in the channel shall be measured by laboratory analysis of samples collected from sample points B or C.
  - d) Suspended solids shall be measured at sample point B or C.
  - e) BOD (ATU) shall be measured at sample point B or C.
15. The consent holder shall notify the Agency in writing if any planned or known introduction or material change in respect of discharges from trade premises to the sewerage system, occurs, that may increase or introduce into the effluent any "dangerous substance" (set out in Annex 2 to this notice as updated from time to time and notified to the consent holder in writing), and any other substance considered by the consent holder as having or likely to have a significant effect on the receiving waters.

**SUBSTANTIAL CHANGE**

16. A discharge shall not be made from the works if it would cause a significant increase in the polluting effects of the discharge on controlled waters as a result of a new or altered discharge of trade effluent into the works.
- 16.1 A discharge of trade effluent into the works is new if -
- (a) it is made by the sewerage undertaker and is of a kind not made into the works by the undertaker immediately before the date of effect of this consent; or
  - (b) it is made by a third party and the discharge is authorised on or after that date.

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

**16.2** A discharge of trade effluent into the works is altered if -

- (a) it is made by the sewerage undertaker and its composition or quantity changes significantly on or after the date of effect of this consent; or
- (b) it is made by a third party and the alteration of the discharge is authorised on or after that date.

**16.3** An increase in the polluting effects of the Discharge on controlled waters is not significant for the purposes of this condition if it relates to any characteristic of the Discharge which is specifically regulated by condition 9 and 10 of this consent but it may be significant if it is caused by a change in some other characteristic of the Discharge.

**16.4** For the purposes of this condition "trade effluent" means -

- (a) any discharge by the sewerage undertaker other than
  - (i) domestic sewage from premises connected directly or indirectly to the works; or
  - (ii) surface water run-off;
- (b) any discharge by a third party which is authorised under Chapter III of Part IV of the Water Industry Act 1991 or which is only accepted as a result of a contract with the sewerage undertaker.

#### **UNAUTHORISED DISCHARGES**

**17.** A discharge made from the works shall not contain any poisonous, noxious or polluting matter or solid waste matter which is attributable to any unauthorised discharge into the works.

- (a) A discharge into the works is unauthorised if it is made by a third party and either there is no obligation to receive it or conditions subject to which there is an obligation to receive it are not observed.
- (b) Nothing in this, or any other, condition of this consent prevents anyone from relying on any defence available to them under section 87 of the Water Resources Act 1991.

#### **TELEMETRY**

**18.** A telemetry alarm system connected to a 24-hour manned station shall be provided and maintained by the Consent Holder to provide a warning in the event that:

- (a) the external power supply to the UV disinfection system has been interrupted;

<b>CONSENT NO.</b>	<b>BP0054601</b>
<b>SCHEDULE NO.</b>	<b>BP0054601 01</b>

- (b) failure of any measurement system used to control the UV dosing system has occurred;
- (c) a Discharge of sewage effluent was made which had not been subjected to the required UV dose as specified in conditions 1(d) and 2 of this consent.

#### **EMERGENCY NOTIFICATION**

19. The Consent Holder shall notify the Agency and Local Food Authority in the event of a Discharge of sewage effluent which has not been subjected to the required UV dose as specified in conditions 1(d) and 2 of this consent, or of power failure causing loss of secondary treatment. Such notification must be made as soon as practicable and no later than 24 hours after the event, and shall detail the reasons why the situation occurred, and the actions taken by the Consent Holder.

#### **POWER**

20. Full stand-by power generation facilities shall be provided and maintained by the Consent Holder in good working order to enable automatic resumption of power to the UV disinfection system in the event of external power supply failure to the UV disinfection plant.

CONSENT NO.	BP0054601
SCHEDULE NO.	BP0054601 01

ANNEX 1

TABLE

Column 1

Column 2

Number of samples  
taken in any period  
of 12 months

Maximum number of samples  
permitted to exceed limit  
for given determinand

4-7	1
8-16	2
17-28	3
29-40	4
41-53	5
54-67	6
68-81	7
82-95	8
96-110	9
111-125	10
126-140	11
141-155	12
156-171	13
172-187	14
188-203	15
204-219	16
220-235	17
236-251	18
252-268	19
269-284	20
285-300	21
301-317	22
318-334	23
335-350	24
351-365	25

CONSENT NO.	BP0054601
SCHEDULE NO.	BP0054601 01

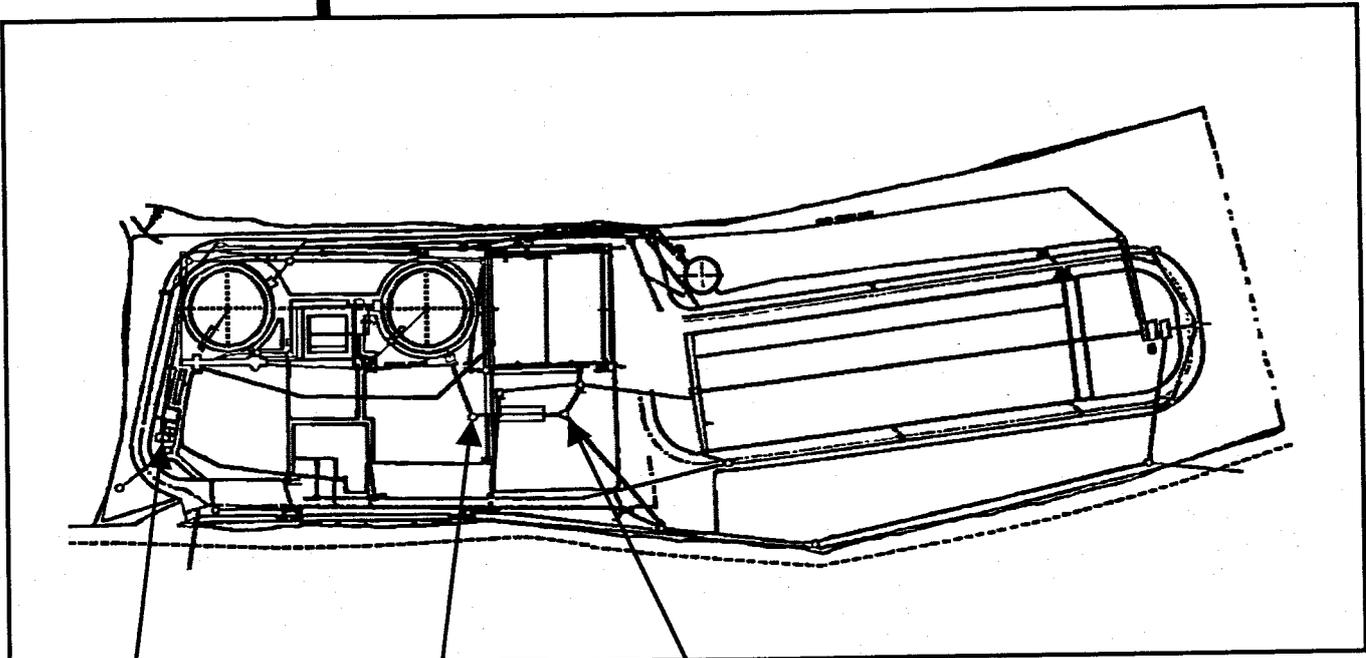
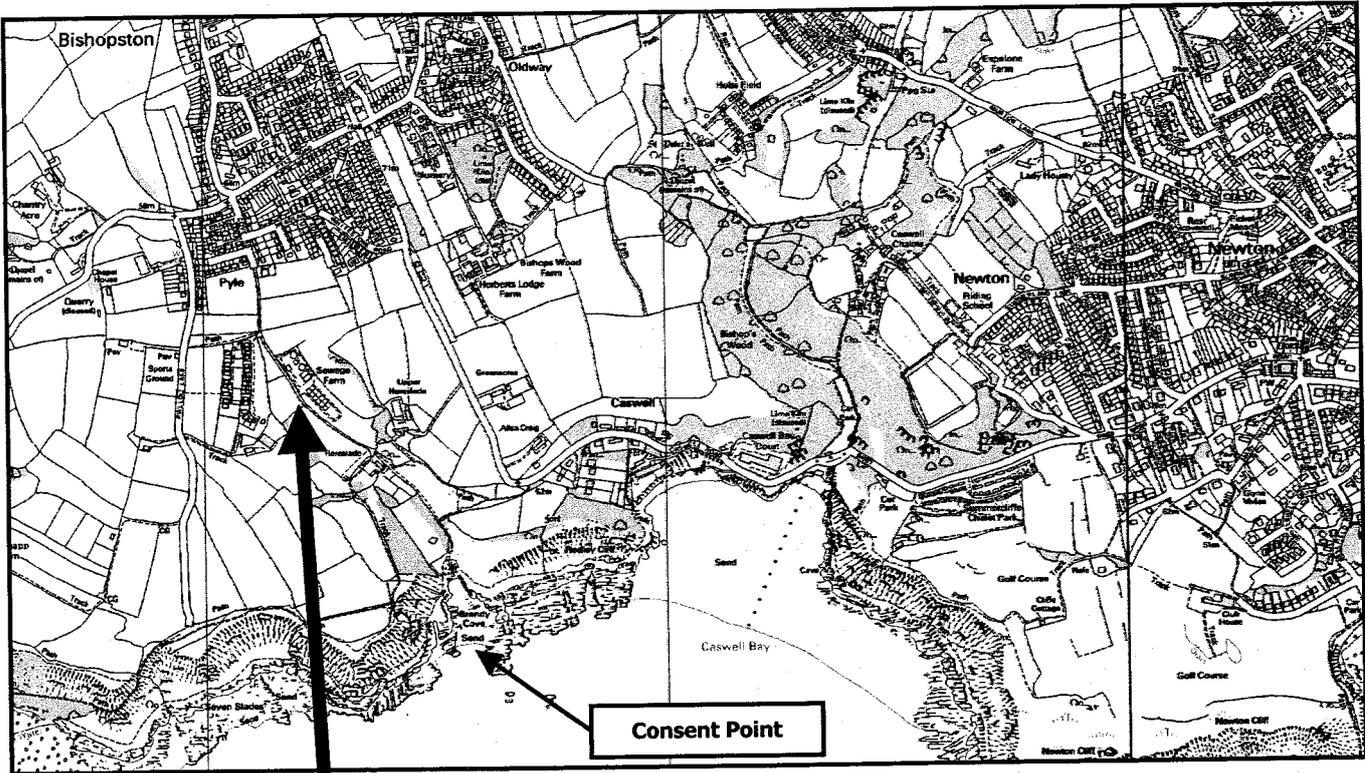
## ANNEX 2

- |  |                              |
|--|------------------------------|
| 1. Mercury and its compounds   | 2. Cadmium and its compounds |
| 3. Hexachlorocyclohexane<br>(lindane and related compounds)            | 4. Carbon tetrachloride      |
| 5. DDT (the isomers of 1,1,1-trichloro-2,2 bis{p-chlorophenyl} ethane) |                              |
| 6. Pentachlorophenol (PCP)   | 7. Aldrin                    |
| 8. Dieldrin  | 9. Endrin                    |
| 10. Isodrin  | 11. Hexachlorobenzene (HCB)  |
| 12. Hexachlorobutadiene (HCBd)   | 13. Chloroform               |
| 14. Polychlorinated biphenyls  | 15. Dichlorvos               |
| 16. 1,2-Dichloroethane   | 17. Trichlorobenzene         |
| 18. Atrazine   | 19. Simazine                 |
| 20. Tributyltin compounds  | 21. Triphenyltin compounds   |
| 22. Trifluralin  | 23. Fenitrothion             |
| 24. Azinphos-methyl  | 25. Malathion                |
| 26. Endosulfan   | 27. Lead                     |
| 28. Chromium   | 29. Zinc                     |
| 30. Copper   | 31. Nickel                   |
| 32. Arsenic  | 33. *Iron                    |
| 34. *pH outside range 5.5 to 9.0                                       | 35. *Boron                   |
| 36. Vanadium   | 37. PCSD'S                   |
| 38. Cyfluthrin   | 39. Sulcofuron               |
| 40. Flucofuron   | 41. Permethrin               |
| 42. 4-Chloro-3-methyl-phenol   | 43. 2-Chlorophenol           |
| 44. 2,4-Dichlorophenol   | 45. 2,4-D (ester)            |
| 46. 2,4-D (non ester)  | 47. 1,1,1-Trichloroethane    |
| 48. 1,1,2-Trichloroethane  | 49. Bentazone                |
| 50. Benzene  | 51. Biphenyl                 |
| 52. Chloronitrotoluenes  | 53. Demeton                  |
| 54. Dimethoate   | 55. Linuron                  |
| 56. MCPA   | 57. Mecoprop                 |
| 58. Mevinphos  | 59. Napthalene               |
| 60. Omethoate  | 61. Toluene                  |
| 62. Triazophos   | 63. Xylene                   |
| 64. Cyanide  | 65. Azinphos-ethyl           |
| 66. Fenthion   | 67. Parathion                |
| 68. Parathion-methyl   | 69. Trichloroethylene        |
| 70. Tetrachloroethylene  | 71. Dioxins                  |
| 72. PAHs   | 73. Nonyl phenol             |
| 74. Nonyl phenyl ethoxylate  | 75. Di-ethylhexyl phthalate  |
| 76. Bisphenol-A  | 77. Diazinon                 |
| 78. Chlorfenvinphos  | 79. Chlorotoluron            |
| 80. Isoproturon  | 81. Diuron                   |
| 82. Propetamphos   | 83. Flumethrin               |
| 84. Amitraz  | 85. High-Cis Cypermethrin    |
| 86. Cyromazine   | 87. Deltamethrin             |
| 88. Cypermethrin   |                              |

This list is applicable as at 1 December 1998 and will be updated as and when changes to the relevant legislative requirements occur.

\*Notification to the Agency by the Consent holder is only required in respect of changes to trade effluents likely to cause significant changes to the pH value, and/or iron or boron concentrations, of the crude sewage.

**Bishopston STW**  
**Brandy Cove Lane,**  
**Bishopston, Swansea**



**Crude Influent**

**Pre-UV**

**Sampling Point  
(Post-UV)**

## **UV code of practice for:**

### **BISHOPSTON STW** **CONSENT NO. BP0054601**

The UV disinfection system shall be provided and maintained to ensure that its hydraulic characteristics and the path length of UV irradiation are such that, during the required period of disinfection, the effluent is subjected to the UV dose rate specified in the consent.

The UV disinfection system and stand-by power facilities shall be operated so as to minimise the frequency and duration of an emergency discharge of sewage effluent which has not been subjected to the required UV dose (as specified in the consent).

The applied and received UV dose (as defined in the Calculation of UV dose) shall be determined from

- i. the flow rate of effluent through the UV disinfection system (l/s);
- ii. the reactor volume;
- iii. the theoretical UV intensity at end of lamp life at an assumed UV transmittance for the effluent (at 254nm) of 45%

### **Maintenance**

- a. A maintenance programme, including the method and frequency of cleaning and replacement of the UV lamps/ UV radiation monitors, shall be undertaken by the Consent Holder as agreed in writing with the Agency.
- b. Any failure to meet the requirements of the agreed maintenance programme shall be advised to the Agency as soon as practicable and a report providing an explanation of the circumstances provided to the Agency within 2 weeks.
- c. The Consent Holder shall keep records of the maintenance undertaken (both programmed and un-programmed) and shall include the measured UV intensity readings immediately before and immediately after each UV lamp/ UV monitor cleaning or replacement. Copies of these records shall be maintained by the Consent Holder and kept available for inspection by the Agency's officers at all reasonable times.