

CONSENT NO. BB3006701



ASiantaeth YR  
AMGYLCHEDD CYMRU  
ENVIRONMENT  
AGENCY WALES

WATER RESOURCES ACT 1991

SECTION 88 – SCHEDULE 10

(AS AMENDED BY THE ENVIRONMENT ACT 1995)

VARIATION OF CONSENT TO DISCHARGE

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

In pursuance of an application by the consent holder for variation of consent, the ENVIRONMENT AGENCY (“The Agency”) in pursuance of its powers under the Water Resources Act 1991 **HEREBY VARIES ITS CONSENT** to the making a discharge OF **SECONDARY TREATED SEWAGE EFFLUENT**, as follows:

**SECONDARY TREATED SEWAGE EFFLUENT incorporating the requirements of the URBAN WASTE WATER TREATMENT REGULATIONS (UWWTR) 1994**

With respect to Variation of Consent No. BB3006701 issued on the 22<sup>nd</sup> day of December 2000

**FROM: PEN Y BONT WWTW**

**AT: PORTOBELLO ROAD, OGMORE BY SEA**

**TO: AFON OGWR**

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

**SECONDARY TREATED SEWAGE**  
**UWWT Regulations 1994**

**BB3006701 01**  
**BB3006701 /U**

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 variations made to this consent, without the agreement in writing of the consent holder, during a period of 4 years from the date this variation is issued.

This variation of consent is issued and takes effect on the 27<sup>th</sup> day of March, 2003

Signed.....*Hamish Osborn*.....

Hamish Osborn  
Team Leader Environment Management

Asiantaeth yr Amgylchedd Cymru  
Glan Tawe, 154 Ffordd Sant Helen, Abertawe, Gorllewin Morgannwg, SA1 4DF  
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Environment Agency Wales  
Glan Tawe, 154 St. Helens Road, Swansea, West Glamorgan, SA1 4DF  
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## CONDITIONS OF CONSENT TO DISCHARGE

### SECONDARY TREATED SEWAGE EFFLUENT ("the Discharge")

FROM: PEN Y BONT WwTW

#### NATURE

1. (a) The Discharge shall consist solely of secondary 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) Discharge shall be disinfected by means of a broad spectrum medium pressure artificial UV source with at least 85% of available UV irradiation emitted in the wavelength range 200 to 300nm. A measured applied UV dose of 30 mJ/cm<sup>2</sup> [calculated at a UV transmittance of 45%] must be exceeded subject to condition (c) and (d).
- (c) The measured applied UV dose must exceed the limit set out in condition (b) for at least 99% of the measurements (as required by condition 19(b)I b), c), d) 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 15 mJ/cm<sup>2</sup>.
- (e) The period when the measured applied UV dose limit is less than the limit set out in conditions (b) / (d) 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 or UV transmittance used in control of the UV dosing system 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 30mJ/cm<sup>2</sup>.

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## LOCATION

3. The Discharge shall be made in the manner and at the place specified as:
  - (a) discharging via a 1675 millimetre diameter pipe;
  - (b) discharging to Afon Ogwr;
  - (c) at National Grid Reference SS 87825 76955;
  - (d) shown marked 'Water Resources Act Outfall' on Plan BB3006701 attached as Annex 4.

## SAMPLING POINTS

4. An appropriately labelled sample point shall be provided and maintained at National Grid Reference SS 87454 76702, as shown marked 'Final Effluent Sample Point' on Plan BB3006701, 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 138240 cubic metres per day.
6. The Dry Weather Flow of the Discharge shall not exceed 89856 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 1600 litres per second.
8. 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 at the discharge point.
9. 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



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professional competence of the expert. A copy of the certifier's report shall be provided to the Agency when it is available.

10. 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.
11. 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.
12. 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.
13. Flows of the discharge shall be measured at the Final Effluent Sample Point NGR SS 87454 76702.

## COMPOSITION

14. (a) Subject to paragraph (b) below, the Discharge shall not contain more than:
  - (i) 25 milligrammes per litre of biochemical oxygen demand (measured after 5 days at 20°C with nitrification suppressed by the addition of allyl-thiourea);
  - (ii) 35 milligrammes per litre of suspended solids (measured after drying at 105°C).

### Summer

- (iii) 6 milligrammes per litre of ammoniacal nitrogen (expressed as N);

### Winter

- (iv) 23 milligrammes per litre of ammoniacal nitrogen (expressed as N);

(b) The limit for any of the relevant parameters set out in paragraph (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 table at Annex 1 to this consent, no more than the relevant number of



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samples, as listed in Column 2 of the said table, exceed the applicable limit for that relevant parameter.

15. The Discharge shall not contain more than:

(a) 60 milligrammes per litre of biochemical oxygen demand (measured after 5 days at 20°C with nitrification suppressed by the addition of allyl-thiourea);

(b) 42 microgrammes per litre of Copper (total)

(c) 0.74 microgrammes per litre of Cadmium (total)

**Summer**

(d) 23 milligrammes per litre of ammoniacal nitrogen (expressed as N).

**Winter**

(e) 51 milligrammes per litre of ammoniacal nitrogen (expressed as N).

For the purposes of Conditions 14 and 15 above, Summer shall mean 1<sup>st</sup> April to 31<sup>st</sup> October. Winter shall mean 1<sup>st</sup> November to 31<sup>st</sup> March.

16. As far as is reasonably practicable, the works shall be operated so as to prevent the Discharge from containing any significant trace of visible oil and grease.

**WORKS OPERATION**

17. 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 Conditions 14, 15 and 16 than is required by those conditions;

(b) any alteration of the works or a change in the type of treatment used.

**MAINTENANCE**

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



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- (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

19. (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 conditions 14, 15, 16 or 17 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;
  - (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 affect.
- (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.



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## RECORDING AND REPORTING

### 20. (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.

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, 6 weeks in arrears, in a format specified by the Agency, on a monthly basis, the records of the readings specified in condition 20(b) I.

### (c) Exception Reports

The Consent Holder shall supply to the Agency at 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;



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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 monthly basis, 6 weeks in arrears.

I. Sample points as shown on attached plan:

- A Crude influent to sewage treatment works at NGR SS 87668 76823.
- B Biologically/secondary treated sewage effluent before UV disinfection at NGR SS 87454 76702.
- C Biologically/secondary treated sewage effluent after UV disinfection at NGR SS 87469 76276.

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.



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- 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 at the inlet shall be measured by laboratory analysis of samples collected from sample point B.
  - d) Suspended solids shall be measured at sample point B or C.
  - e) BOD (ATU) shall be measured at sample point B or C.
21. 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.

### TELEMETRY

22. 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) 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

23. The Consent Holder shall notify the Agency 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

24. 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.



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### THE DANGEROUS SUBSTANCES LIST I CONDITION

25. (a) The quantity of List I Substances (as defined in the Dangerous Substances Directive 76/464/EEC) in the Discharge shall not increase above:
- i the levels specifically regulated by condition 15

### THE DANGEROUS SUBSTANCE LIST II CONDITION

26. (a) The quantity of List II Substances (as defined in the Dangerous Substances Directive 76/464/EEC) in the Discharge shall not increase above
- i the levels specifically regulated by condition 15
  - ii the levels in the Discharge on the date of effect of this consent where no specific level is authorised; and
- (b) notwithstanding (a) above, the Discharge shall not contain quantities of any List II Substance such as to cause or contribute to the concentration of that substance in the receiving water exceeding the relevant Environmental Quality Standard (EQS).

### SUBSTANTIAL CHANGE

27. (a) 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.
- (b) A discharge of trade effluent into the works is new if -
- (i) 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
  - (ii) it is made by a third party and the discharge is authorised on or after that date.
- (c) A discharge of trade effluent into the works is altered if -
- (i) 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
  - (ii) it is made by a third party and the alteration of the discharge is authorised on or after that date.



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(d) 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 characteristics of the discharge which are specifically regulated by conditions 14, 15 or 16 of this consent schedule, but it may be significant if it is caused by a change in some other characteristic of the discharge.

(e) For the purposes of this condition "trade effluent" means -

(i) any discharge by the sewerage undertaker other than

- (1) domestic sewage from premises connected directly or indirectly to the works; or
- (2) surface water run-off;

(ii) 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 DISCHARGE

28. (a) 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.
- (b) 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.
- (c) 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.

#### POWER TO MODIFY CONDITION

29. If the Agency believes that the load of one or more Dangerous Substances has increased, it may at any time after the issue of this discharge consent, modify this consent by written notification to include specific limits for List I and List II Substances as defined in the Dangerous Substances Directive (76/464/EEC), or any Substance with a non-statutory EQS. This includes any period during which the Agency would otherwise be prohibited from modifying the consent.



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## CONDITIONS OF CONSENT TO DISCHARGE

### SECONDARY TREATED SEWAGE EFFLUENT ("the Discharge")

FROM: PEN Y BONT WwTW

### URBAN WASTE WATER TREATMENT REGULATIONS

**U0** (a) The Consent Holder shall comply with the Urban WasteWater Treatment (England and Wales) Regulations 1994 ('the Regulations').

(b) For the purpose of conditions U1 and U2 below, interpretations and references to a numbered regulation or Schedule shall have the meaning as in the Regulations, unless otherwise indicated.

**U1** (a) The Discharge derives from an agglomeration with a population equivalent of between 10,000 and 150,000, discharging to freshwaters.

(b) The Consent Holder shall inform the Agency in writing of any change, or proposed change, to the population equivalent such as would make a material change to the application of the Regulations and shall, on request, inform the Agency in writing of the actual population equivalent.

(c) The Discharge shall be subject to Regulation 5(1) and shall satisfy the relevant requirements of Part I of Schedule 3.

**U2** (a) The Consent Holder shall provide apparatus for the purpose of:

- (i) measuring or recording the volume, rate of flow, nature, composition or temperature, and
- (ii) collecting samples of any waste water, as is necessary to ensure compliance with paragraph (b) below.

(b) The Consent Holder shall monitor the Discharge to verify compliance with the requirements of condition U1(c) above in accordance with control procedures as set out in Part II of Schedule 3.

(c) The Consent Holder shall provide to the Agency any information collected in complying with paragraph (b) above in a manner agreed with the Agency.

### **U3(a) Inlet**

An appropriately labelled sample point shall be provided and maintained at National Grid Reference SS 87668 76823, as shown marked 'Crude Sewage Sample point' on the attached Plan BB3006701, or some other point as agreed in writing with the Agency, so that a representative sample of the Influent may be obtained.



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**U3(b) Outlet**

An appropriately labelled sample point shall be provided and maintained at National Grid Reference SS 87454 76702, as shown marked 'UWWTR and Water Resources Act Final Effluent Sample point' on the attached Plan BB3006701, or some other point as agreed in writing with the Agency, so that a representative sample of the Discharge may be obtained.

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ANNEX 1

TABLE

Column 1

Number of samples  
Taken in any period  
of 12 months

Column 2

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



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## 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. Flucifuron   | 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.



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Amgylchedd Cymru  
Environment  
Agency Wales

### ANNEX 3

#### UV code of practice for:

**PEN Y BONT WwTW**  
**CONSENT NO. BB3006701**

*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.



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## Calculation of UV dose

### Definitions

For each bank of UV lamps, UV dose is defined as the product of UV light intensity (impacting on wastewater passing through the bank) and the retention time (of wastewater passing through the bank).

For the purposes of consent, the following terms are defined for each UV irradiation bank:

**“reactor volume”**

is the volume of wastewater in the bank at any given time;

**“adjusted retention time”**

is the reactor volume divided by the measured rate of flow through the UV bank;

**“measured UV intensity”**

is the average UV intensity @ 254nm for the effluent measured (at positions within the reactors agreed with the Agency in writing) for each operating bank of UV lamps.

**“theoretical UV intensity”**

is the predicted average UV intensity across the reactor volumes, being delivered by the operating lamps at the UV transmittance of 45% (as agreed with the Agency in writing) for the effluent (at 254nm) (predicted from the rated output (mW) of the UV lamps at end of lamp life (cleaned) which are energised;

### Calculations

- i. **Received UV Dose per Bank (mJ/cm<sup>2</sup>)** = **Measured UV Intensity (mW/cm<sup>2</sup>)** X **Adjusted Retention Time (s)**
- ii. **Applied UV Dose per Bank (mJ/cm<sup>2</sup>)** = **Theoretical UV Intensity (mW/cm<sup>2</sup>)** X **Adjusted Retention Time (s)**

The UV dose (applied or received) for each channel is the sum of the UV doses for each operational bank in that channel.

The method of measuring/estimating UV intensity at this site must be clearly defined.

