

NATIONAL RIVERS AUTHORITY
AWDURDOD AFONYDD CENEDLAETHOL

WELSH REGION
RHANBARTH CYMRU



NRA

Guardians of the Water Environment
Diogelwyr Amgylchedd Dŵr

**SWANSEA BAY
AND ASSOCIATED CATCHMENTS:
USES, OBJECTIVES AND STANDARDS**

Regional Environmental Appraisal Unit
National Rivers Authority
St. Mellons
CARDIFF CF3 OLT

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NRA - WELSH REGION

CONTENTS

DEFINITIONS

1.0 TIDAL WATERS

1.1 Uses

1.2 Environmental Quality Objectives (EQO's)

1.3 Environmental Quality Standards (EQS's)

1.4 Guidance notes on achieving the required EQO's

2.0 INLAND WATERS

2.1 Implementation of existing Inland Waters policy to the Swansea Bay catchment

2.2 River Quality Standards

2.2.1 NWC Classification scheme

2.2.2 EC Freshwater Fish Directive

2.2.3 EC Dangerous Substances Directive

2.2.4 EC Surface Water Quality Directive

2.2.5 Use-related standards for non-classified and/or non-designated watercourses

2.3 Guidance notes on achieving the required standards.

REFERENCES

APPENDIX 1 Uses and Environmental Quality Objectives for tidal waters.

APPENDIX 2 Aesthetic Water Quality and Emission Standards for tidal and sensitive inland waters.

SWANSEA BAY AND ASSOCIATED CATCHMENTS - USES, OBJECTIVES AND STANDARDS

DEFINITIONS

N.B. Throughout this document the terms SWANSEA BAY (THE BAY) and INNER SWANSEA BAY (INNER BAY) refer to all tidal waters (coastal and estuarine) in the following geographical limits.

*SWANSEA BAY - Worm's Head to Porthcawl Pt.

*INNER SWANSEA BAY - Mumbles Head to West Pier.

IMPORTANT NOTES

1. Consultation will be required throughout the scheme design process on all design proposals pertinent to environmental impact matters.
2. Techniques and models used for both hydraulic and water quality modelling will require approval from the NRA as to their suitability and sensitivity analyses will be required as appropriate to the environmental design requirements indicated in this document.
3. The National Rivers Authority reserves the right to amend any conditions in this document as and when future policy is developed and/or statutory objectives are derived for controlled waters.
4. Notwithstanding the environmental standards presently required and detailed herein, it may be prudent for dischargers to consider the possibility of increased standards and additional treatment during the future life of a scheme in order to protect their investment.
5. Any further constraints (e.g. uses, standards, geographic limits etc.), brought to the attention of the NRA following consultations will be advised as appropriate.

1.0 TIDAL WATERS

1.1 Uses

Uses as categorised in Appendix 1 and repeated below for clarity have been applied to both the coastal and estuarine waters of the bay as follows (Ref.1):-

1. Basic amenity
2. General ecosystem conservation
3. Migratory fishery
4. Commercial harvesting of fish for public consumption
5. Commercial harvesting of crustacea and molluscs for public consumption.
6. Bathing
7. Other water contact based recreation.
8. Other recognised uses not incorporated in 1 - 7 (e.g. Industrial abstractions, Harvesting of edible seaweed.

Uses 1 and 2 are uses applicable to all tidal waters and will therefore apply throughout Swansea Bay.

Use 3 will apply to Swansea Bay.

Uses 4 and 5 apply in some areas of the Bay. Advice from the South Wales Sea Fisheries Committee and MAFF as to extent of use, suggests that the commercial fishing effort in Swansea Bay is extensive for both fish and crustacea.

Use 6 will apply only to those bathing waters identified by the DoE/Welsh Office as falling under the terms of the EC Bathing Waters Directive (ref.2.).

Use 7 will apply to those waters identified for use 6 and other traditionally used areas identified after local consultations.

No other uses under Use 8 are felt applicable.

1.2 Environmental quality objectives (EQO's).

Environmental quality objectives are set to protect each legitimate use to which the tidal waters are put. These are given in full in Appendix 1.

The geographical constraints of each EQO will be determined after local consultation and it will also be appropriate to apply temporal limits. Initial proposed limits of use are as follows:

1.2.1 EQO No.1 (Basic Amenity)

Throughout the year for all tidal waters in the bay.

1.2.2 EQO No.2 (General ecosystem conservation)

This objective applies to all saline waters of the estuaries up to the tidal limit throughout the year.

1.2.3 EQO No.3. (Migratory fish)

Throughout the year up to the tidal limit of all estuaries.

1.2.4 EQO No.4/5 (Commercial harvesting of fish and crustacea)

Throughout the year in the whole Bay area from advice received from SW Sea Fisheries Committee and MAFF, oyster beds being identified in Figures 1 and 2.

1.2.5 EQO No.6. (Bathing)

For the stretch of the identified bathing waters (see Figure 3) and applicable for the period May to September (inclusive). These include:

Port Eynon Bay
Oxwich Bay
Caswell Bay
Langland Bay
Limeslade Bay
Bracelet Bay
Inner Swansea Bay *
Aberavon sands
Rest Bay

Although the width of the bathing water strip is not specifically defined it would extend to a reasonable distance offshore where bathing is traditionally practised. For initial guidance we would consider a reasonable distance to be 100m from the water's edge.

* For practical reasons bathing in the Inner Bay, due to extensive offshore mud-flats, is limited to the period approx. HW-2 to HW+2. Standards appropriate to this objective need only be achieved over this use period.

N.B. The stretch of the identified bathing waters is shown in Figure 3. In particular, the eastern extent of Oxwich Bay and the western extent of the Inner Bay are shown as hatched outlines in the figure. Their inclusion or otherwise will be advised after local consultations.

1.2.6 EQO No.7 (Other water contact based recreation)

Throughout the year over defined areas of water extending offshore from the identified bathing waters to a distance where water-contact sports are traditionally practised. This distance would extend to at least 100 m from the water's edge and further offshore where local usage is identified from local consultation. Other areas identified under this use will be advised after local consultation.

1.3 Environmental quality standards (EQS's)

In order to achieve the objectives set then the following standards will be applicable:

1.3.1 EQO No.1 (Basic Amenity)

Aesthetic standards as specified in Appendix 2 (A2.A.1) will apply.

1.3.2 EQO No.2 (General Ecosystem Conservation)

All EQS's given in DoE circular 7/89 (Welsh Office 16/89) (Ref.4) for listed substances under the EC Dangerous Substances Directive (Ref.5.) and its associated daughter directives will apply. The NRA Welsh Region must also be notified of the possibility of any Red List substances being present in sewage effluents due to trade effluents to sewer or other routes. Detailed implementation for dealing with Red List substances will continue to be the responsibility of HMIP in consultation with the NRA. In the case of discharges containing red list substances, the extent of the mixing zone must be measured.

There are no designated shellfisheries in the bay under the terms of the EC shellfish directive (Ref.6.) These standards under this Directive do not therefore apply.

1.3.3 EQO No.3 (Migratory Fish)

Dissolved oxygen to exceed 5 mg/l for 95% of the time, with an absolute minimum D.O. of 3 mg/l Annual mean for unionised ammonia must not exceed 0.02mg/l and must not exceed 0.12mg/l as a maximum value on any occasion. These standards will apply throughout the year.

1.3.4 EQOs No.4/5 (Commercial harvesting of fish and crustacea)

Standards appropriate to the protection of public health from consumption of fish or shellfish originating in Swansea Bay are the responsibility of the Environmental Health Departments of Swansea City, the borough councils and MAFF. If these uses are deemed applicable then the standards set by the responsible authorities will be advised after the necessary consultations. Standards required to achieve these objectives are likely to be subject to two forthcoming EC Directives, one on fish and the other on crustacea.

1.3.5 EQO No. 6(Bathing)

Aesthetic standards as specified in Appendix 2 (A2.A.3) apply. Also, those bacteriological imperative standards as specified in the EC Bathing Waters Directive,

i.e. 2000 E.Coli 100ml⁻¹
10000 Total coliforms 100ml⁻¹

will apply for 95% of samples taken during the bathing season at the designated sampling point. For design purposes the standards must be achieved over the full extent of all the identified bathing waters.

1.3.6 EQO No. 7(Other water contact recreation)

Aesthetic standards as specified in Appendix 2 (A2.A.2) apply. In particular a minimum effluent dilution standard of 100 will apply to achieve the aesthetic requirements, although in certain circumstances agreed mixing zone definitions can be applied (see 1.4.4).

1.4 Guidance notes on achieving the required EQS's

The following guidance are given to ensure compliance with required environmental quality standards:

1.4.1 EQO No.1 (Basic Amenity)

Detailed guidance is given in Appendix 2 (A2.A.1). Particular attention must be paid to the removal of persistent materials (such as condoms, cotton buds, backing strips for feminine sanitary products etc.) in the effluent. These must be removed from the flow and disposed off-site, all year round. It will be necessary to demonstrate that the chosen preliminary treatment process is effective and efficient at removing such material and also in reducing faecal particle sizes as required. Field trials or reference to independent published literature would be required for this purpose.

1.4.2 EQO No.2 (General ecosystem conservation)

The extent of any 'mixing zone' for listed substances (i.e. zone of approved EQS failure) will have to be demonstrated to and agreed by the NRA and/or HMIP on a case by case basis

For discharges containing trade effluents, the composition of this component will need to be provided. It will be necessary to demonstrate that adequate dilution and dispersion is available at the discharge location to prevent acutely toxic effects. The need to minimise accumulation in organisms should also be taken into account.

1.4.3 EQO No. 6(Bathing)

There will be a need to demonstrate, principally by means of modelling techniques, that any scheme proposals and design are consistent with achieving the EQS's and demonstrate that:

- a) coliform loads used for scheme design and impact appraisal are supported by actual monitoring of sewage strengths and flows.
- b) coliform die-off rates are appropriate for the local circumstances and supported by in-situ measurements or published data.
- c) a minimum initial dilution at the outfall of 100:1 is achieved to avoid density stability on release of the effluent into the receiving waters. Occasional transgressions of the design standard for short periods may be agreed on a case by case basis, provided all reasonable efforts have been made to achieve the dilutions so described.

- d) a sensitivity analysis is available on the effect of water quality arising from changes to the relevant design criteria (e.g. changes in wind speed/direction, dispersion coefficients used in the model, T90 variations etc.,)

1.4.4 EQO No 7 (Other water contact based recreation)

Where a sewage discharge is made directly into the use area irrespective of the level of treatment, then every effort should be made to achieve the 100:1 effluent dilution standard (see A2.A.2). However, the National Rivers Authority (Welsh Region) may consider, on a case by case basis, the application of a mixing zone up to the boundary at which the effluent has received at least 100 dilutions.

2.0 INLAND WATERS

Procedures for the prevention of pollution in inland waters do not primarily derive from the use-related approach adopted for coastal and estuarine waters. The existing approach for inland waters is best described by reference to local, national and EC policy and directives. Sections 2.0.1. to 2.0.5 below describe this approach and are further interpreted in sections 2.1 and 2.3 for the purposes of this document:

2.0.1 National Water Council (NWC) Classification scheme (Ref.7)

Rivers under this scheme are divided into classified stretches whereby the quality of the water, as measured against certain defined parameters, determines the class of that particular stretch. Long term river quality objectives (LTRQO's) are then set to achieve a certain improved or maintained class for that stretch.

2.0.2 EC Freshwater Fisheries Directive (Ref.8)

The implementation of this Directive requires that river stretches are designated where important salmonid or cyprinid fisheries are recognised. Within these stretches the water quality standards, as defined in the Directive, must be achieved. Those applying depend upon whether the stretch is designated as a salmonid or cyprinid fishery or both.

2.0.3 EC Dangerous Substances Directive

This Directive is applicable to all waters and hence equally applies to inland waters as to tidal waters. The UK implementation of this Directive (Ref.4) covers all environmental quality standards to be achieved for the listed substances.

2.0.4 EC Surface Water Quality Directive (Ref.9)

This Directive applies to all surface waters abstracted for potable water use. The Directive does not impose standards for surface water quality but classifies the existing water quality into 3 classes - A1, A2 or A3. The classification then determines the level of treatment required before the water is suitable for potable use. (e.g. A1 refers to the highest class of water quality and thereby requiring only the minimum amount of treatment).

2.0.5 Use-related approach for non-classified and/or non-designated watercourses will be developed in due course.

In the interim for the protection of non-classified (non- NWC) and non-designated (non EC Fish) minor watercourses then a use-related approach will be adopted. The standards appropriate to the protection of the identified uses will be set by the NRA (Welsh Region) after appropriate consultations.

2.1 Implementation of existing Inland Waters policy to Swansea Bay

Table 1 gives a summary of river stretches and LTRQO's for the rivers draining into Swansea Bay. The table also includes a summary of the stretches designated under the terms of the Directives described in 2.0.2 to 2.0.4.

- (i.e. PW (SWD) - Potable water (Surface Water Directive)
FF (S) - Freshwater Fishery (Salmonid)
FF (C) - Freshwater Fishery (Cyprinid)
DS - Dangerous Substances

2.2 River quality standards

For all inland watercourses, basic standards necessary to protect amenity and conservation will be required all year round. These require a visually unobjectionable state and one without offensive odour in addition to those standards which may be deemed appropriate under section 2.2.5. In certain circumstances however, a seasonal consent may be required in order to protect the receiving water at times of reduced flows and increased populations. Storm flows will require screening to the levels described in Appendix 2 (A2.B).

Clearly the most stringent standards for any particular water quality parameter will apply, (e.g. for classified and designated stretches then the most stringent NWC standards or EC Fish Directive standards will apply). In consent setting for continuous discharges, sensitivity analysis must be undertaken and reported.

2.2.1 NWC Classification scheme

Current NWC standards, as defined by the DoE (DoE, 1986), will apply in relation to the river systems and their LTRQO's as indicated in Table 1. However, where current quality exceeds the LTRQO's, no deterioration is to be allowed.

2.2.2 EC Freshwater Fish Directive

Designated salmonid and cyprinid stretches indicated in Table 1 are required to achieve the relevant standards as appropriate to the type of fishery as detailed in the Directive.

2.2.3 EC Dangerous Substances Directive

The standards for all listed substances as given in the UK implementation of this Directive (Ref.4) will apply to all inland watercourses. In particular, for the 3 stretches indicated on the River Tawe, the EQS for nickel is relevant due to known industrial sources.

2.2.4 EC Surface Water Quality Directive

Where abstraction for potable water quality is indicated in Table 1 then this Directive will apply and the relevant level of treatment must be undertaken according to the classified surface water quality at the abstraction point.

2.2.5 Use-related standards for non-classified and/or non-designated watercourses.

The following approach will be adopted for dealing with non-classified and/or non-designated stretches. Each stretch must receive a locally derived RQO and RQS (based on the NWC classification scheme) where relevant.

- a) The uses of the waters will be identified after appropriate consultations with local pollution control staff.
- b) Standards will be set to protect the identified uses utilising NWC class limits if appropriate. No assigned NWC standards will be more relaxed than those for class 2B, unless the objective is solely to prevent nuisance - (see c) below). For consent setting purposes no more than a single sub-class deterioration (in NWC terms) will be acceptable, below the point of discharge.
- c) Where the sole objective is to prevent nuisance, a 95%ile BOD of 20 mg/l may be applied provided the aeration characteristics of the watercourse are sufficient to maintain aerobic conditions.

2.3 Guidance notes on achieving the required standards.

There are more than 100 identified storm overflows in the Swansea sewerage system. Those causing particular problems, discharge above Trebanos STW, into the Lower Clydach and into the Tawe Estuary. In particular, five are located on the main trunk sewer of which 4 discharge to the Tawe river and 1 to the estuary. Others, not on the main trunk sewer, discharge directly to the bay, estuary, river or tributaries thereof. There should be no unscreened storm overflows on the main trunk sewer.

2.3.1 Storm Overflow Water Quality Considerations

Significant Proposals:

- a) These are defined as overflows serving a catchment where the following conditions apply:

| | |
|---------------------------------|-------------------------|
| Dry Weather Flow (DWF) | > 600 m ³ /d |
| Population | > 5000 |
| Cost of relevant part of scheme | > £250,000 |

- b) Hydraulic and water quality impact modelling will be required such that the spill volumes are consistent with achieving the most stringent standards that apply in the watercourse.

Detailed hydraulic modelling of a significant proportion of the Swansea sewerage system will be required according to the criteria set out in the Storm Sewer Overflow Policy Guidance notes available as a supplement to this report. Details of the currently approved techniques for assessing the level of acceptable impact are also included in the above notes.

Non-significant Proposals:

- a) For these proposals the impact on the watercourse may be evaluated by simpler mass-balance techniques. The results must

be consistent with achievement of the most stringent standards that apply.

Hence the currently approved QUALSOC criteria should be applied using the standards indicated below :

| | | | |
|------------------|-------|-------------|------------------------------------|
| Receiving waters | LTROQ | NWC Class 1 | - 10 mg/l BOD (99%ile impact std.) |
| " | " | NWC Class 2 | - 20 mg/l BOD (" " ") |
| " | " | NWC Class 3 | - 30 mg/l BOD (" " ") |

All classes should exhibit no evidence of visible gross solids or give rise to complaints.

2.3.2 Storm Overflow Aesthetic Considerations

All those overflows discharging to sensitive water should be screened at the level defined by HMIP (Appendix 2). Such overflows include all those discharging direct to the main river and estuary, especially those behind the Tawe barrage. It will be necessary to demonstrate the effectiveness and efficiency of selected screens either by reference to field trials, or to relevant independent published literature. Further guidance for sensitive and non-sensitive waters is given in Appendix 2 (A2.B.1 and A2.B.2).

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3. HER MAJESTY'S INSPECTORATE OF POLLUTION (1988)
Letter to the Managing Directors of Regional Water Authorities. 'Guidelines on Long Sea Outfalls - COPA Consent applications'. HMIP, 15 September 1988
4. DoE/WELSH OFFICE (1989)
WATER AND THE ENVIRONMENT. The implementation of the European Community directives on pollution caused by certain dangerous substances discharged into the aquatic environment.
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Council Directive of 4 May 1976 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community. (76/464/EEC). Official Journal of the European Communities. L129. 1976.
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River quality: the 1980 survey and future outlook. Appendix B, p.23.
8. EUROPEAN COMMUNITIES (1978)
Council Directive of 18 July 1978. On the quality of freshwaters needing protection or improvement in order to support fish life. (78/659/EEC). Official Journal of the European Communities. L222. 14th August 1978.
9. EUROPEAN COMMUNITIES (1975)
Council Directive of 16 June 1975, concerning the quality required of Member States (75/440/EEC). Official Journal of the European Communities. L194. 25th July 1975.

TABLE 1 SUMMARY OF RIVER STRETCHES AND LTROO'S, WITH USE RELATED OBJECTIVES

| RIVER | HYDROMETRIC REF | KM | U/S OS GR | D/S OS GR | LTQO | PW(SWD) | FF(S) | FF(C) | DS |
|---------------|-----------------|-----|-----------|-----------|------|---------|-------|-------|----|
| KENFIG | 58-5-10-1-1-0 | 2.5 | SS803828 | SS814823 | 2B | | | | |
| " | 58-5-10-1-3-0 | 1.6 | SS814823 | SS824831 | 2A' | | | | |
| " | 58-5-10-1-3-0 | 1.9 | SS824831 | SS824836 | 2B | | | | |
| " | 58-5-10-1-4-0 | 0.2 | SS842836 | SS832887 | 1A | | | | |
| NANT GRAIG | -9-1-0 | 2.6 | SS842835 | SS856855 | 2B | | | | |
| " | -9-2-0 | 0.3 | SS586855 | SS847861 | 1B | | | | |
| AFAN | 58-6-10-1-1-0 | 0.4 | SS759897 | SS767904 | 1A | | S | | |
| " | -1-2-0 | 5.0 | SS767904 | SS793941 | 1A | | S | | |
| " | -1-3-0 | 2.0 | SS793941 | SS819951 | 1A | | S | | |
| " | -1-4-0 | 5.8 | SS819951 | SS861963 | 1A | | S | | |
| " | -1-5-0 | 3.5 | SS861963 | SS895979 | 1A | | S | | |
| FFRWYDWYLLT | 58-6-10-2-1-0 | 6.8 | SS770888 | SS820921 | 1A | | | | |
| AFAN FEEDER | -3-1-0 | 0.2 | SS758895 | SS756894 | 1A | | | | |
| PELENA | -8-1-0 | 5.2 | SS793941 | SS816992 | 2B | | | | |
| " | -8-2-0 | 0.2 | SS816972 | SS816978 | 1A | | | | |
| CWM GWENFFRWD | -9-1-0 | 1.3 | SS798962 | SS795977 | 2B | | | | |
| " | -9-2-0 | 0.2 | SS795979 | SS795976 | 1A | | | | |

TABLE 1

| RIVER | HYDROMETRIC REF | KM | U/S OS GR | D/S OS GR | LTQO | PW(SWD) | FF(S) | FF(C) | DS |
|-----------------------|-----------------|------|-----------|-----------|------|---------|-------|-------|----|
| CORRWG | 58-6-10-14-1-0 | 4.8 | SS862963 | SS881994 | 1A | | | | |
| NEATH | 58-7-10-1-1-0 | 0.5 | SS773994 | SS773993 | 1B | | S | | |
| " | -1-2-0 | 3.2 | SS773993 | SN817022 | 1B | | S | | |
| " | -1-3-0 | 5.6 | SN817022 | SN864057 | 1A | | S | | |
| " | -1-4-0 | 14.2 | SN864057 | SN910090 | 1A | | S | | |
| CLYDACH | -5-1-0 | 1.6 | SS738978 | SN765058 | 1B | | | | |
| DULAIS | 11-1-0 | 6.0 | SS773995 | SN789041 | 2B | | | | |
| " | 11-2-0 | 1.3 | SN789041 | SN790048 | 1B | | | | |
| " | 11-3-0 | 1.3 | SN790048 | SN793062 | 1B | | | | |
| " | 11-4-0 | 5.8 | SN793062 | SN798090 | 1B | | | | |
| MERLIN COURT BROOK | 23-1-0 | 1.3 | SN818023 | SN845005 | 1A | | | | |
| NANT CLWYD | 28-1-0 | 0.4 | SN843036 | SN846074 | 1A | | | | |
| CWMGWRELYCH | 35-1-0 | 2.1 | SN881067 | SN917057 | 2B | | | | |
| DRINGIRTH/MELLTE | 37-1-0 | 9.2 | SN902074 | SN936074 | 1A | PW | S | | |
| WAEN HEPSTE | 40-1-0 | 10.9 | SN924098 | SN965146 | 1A | | | | |
| LLIA | 43-1-0 | 1.0 | SN936144 | SN926191 | 1A | | | | |
| PYRDDIN | 44-1-0 | 4.8 | SN903074 | SN872099 | 1A | | | | |

| RIVER | HYDROMETRIC REF | KM | U/S OS GR | D/S OS GR | LTQO | PW(SWD) | FF(S) | FF(C) | DS |
|-----------------------|-----------------|------|-----------|-----------|------|---------|-------|-------|----|
| PORT TENNANT CANAL | 58-8-10-1-1-0 | 8.7 | SS712939 | SS772993 | 1B | | | | |
| NEATH CANAL | 58-9-10-1-1-0 | 13.7 | SS734942 | SN817022 | 1B | | | | |
| SWANSEA CANAL | 58-10-10-1-1-0 | 10.9 | SN685005 | SN752064 | 1B | | | | |
| TAWNE | 59-1-0-1-2-B | 1.7 | SS671974 | SS676990 | 1B | | S | | Ni |
| " | -1-2-A | 3.4 | SS676990 | SN688012 | 1B | | S | | Ni |
| " | -1-3-B | 0.6 | SN688012 | SN691011 | 1B | | S | | Ni |
| " | -1-3-A | 5.1 | SN691011 | SN724036 | 1B | | S | | |
| " | -1-4-0 | 2.6 | SN724036 | SN740054 | 1B | | S | | |
| " | -1-5-0 | 4.3 | SN740054 | SN771084 | 1B | | S | | |
| " | -1-6-0 | 3.5 | SN771084 | SN790110 | 1B | | S | | |
| " | -1-7-0 | 5.8 | SN790110 | SN834127 | 1B | | S | | |
| " | -1-8-0 | 4.8 | SN834127 | SN846164 | 1A | | S | | |
| " | -1-9-0 | 1.3 | SN846164 | SN848172 | 1A | | S | | |
| " | -1-10-0 | 0.6 | SN848172 | SN849177 | 1A | | S | | |
| NANT Y FENDROD | -2-1-B | 1.4 | SS672966 | SS679974 | 1B* | | | | |
| " | -2-1-A | 0.3 | SS679974 | SS679977 | 1B | | | | |

* A derogation order for Zinc will apply in this case

TABLE 1 (cont)

| RIVER | HYDROMETRIC REF | KM | U/S OS GR | D/S OS GR | LTQO | PW(SWD) | FF(S) | FF(C) | DS |
|---------------|-----------------|-----|-----------|-----------|------|---------|-------|-------|----|
| LOWER CLYDACH | -3-1-0 | 4.3 | SS676990 | SN687045 | 1B | | | | S |
| UPPER CLYDACH | 59-1-0-4-1-0 | 2.7 | SN724036 | SN714057 | 2B | | | | |
| UPPER CLYDACH | -4-2-B | 3.9 | SN714057 | SN698086 | 1B | | | | |
| " | -4-2-A | 0.2 | SN698086 | SN699089 | 1B | | | | |
| TWRCH | -7-1-B | 1.7 | SN771084 | SN770099 | 1B | | | | S |
| " | -7-1-A | 2.0 | SN770099 | SN757113 | 1B | | | | S |
| " | -7-2-0 | 0.3 | SN757113 | SN755114 | 1B | | | | S |
| " | -7-3-0 | 5.6 | SN755114 | SN772163 | 1A | | | | S |
| NANT GWYS | -8-1-0 | 3.1 | SN755114 | SN783127 | 1B | | | | |
| GIEDD | -10-1-0 | 3.2 | SN790110 | SN791137 | 1A | | | | |

TABLE 1 (cont.)

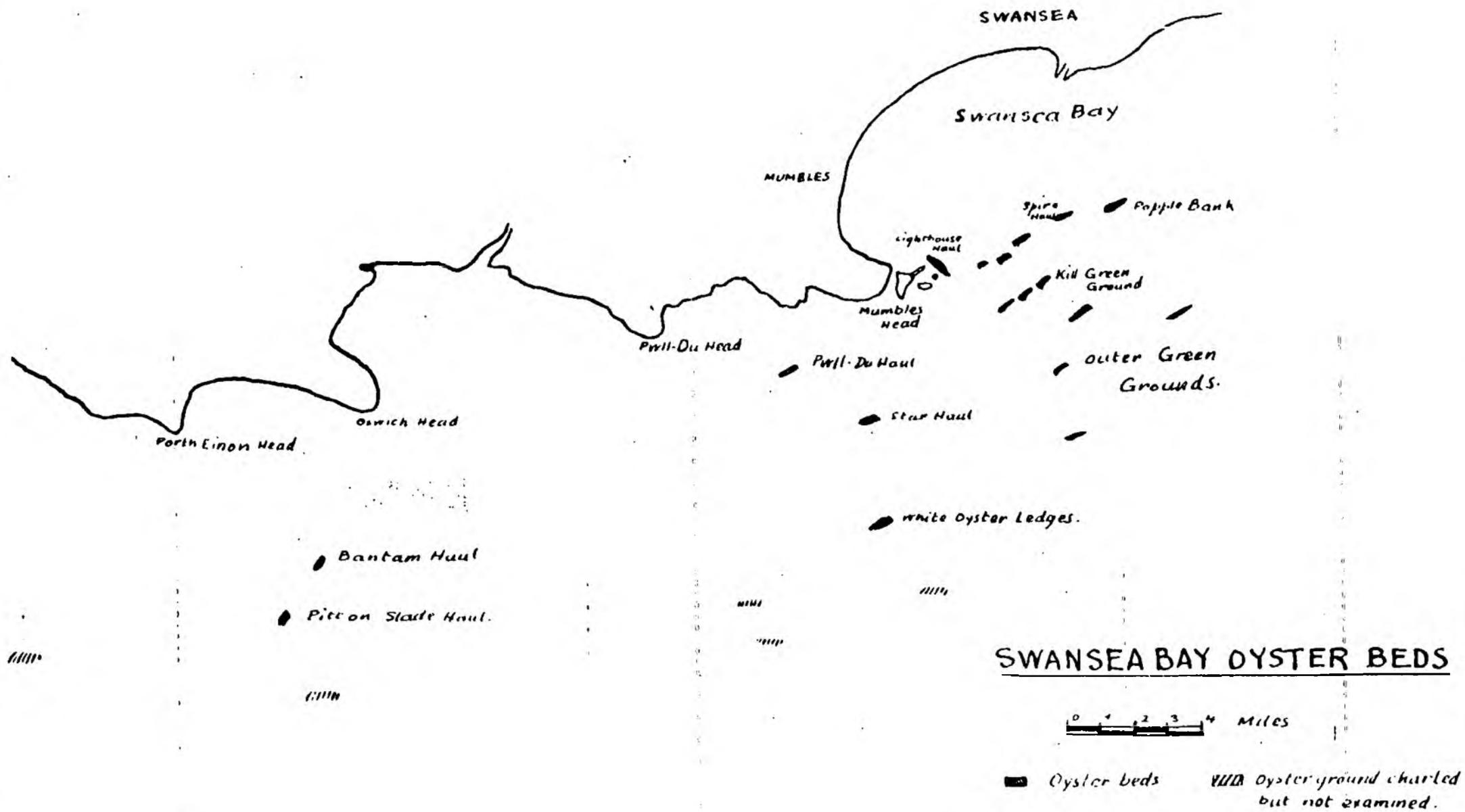


FIGURE 1

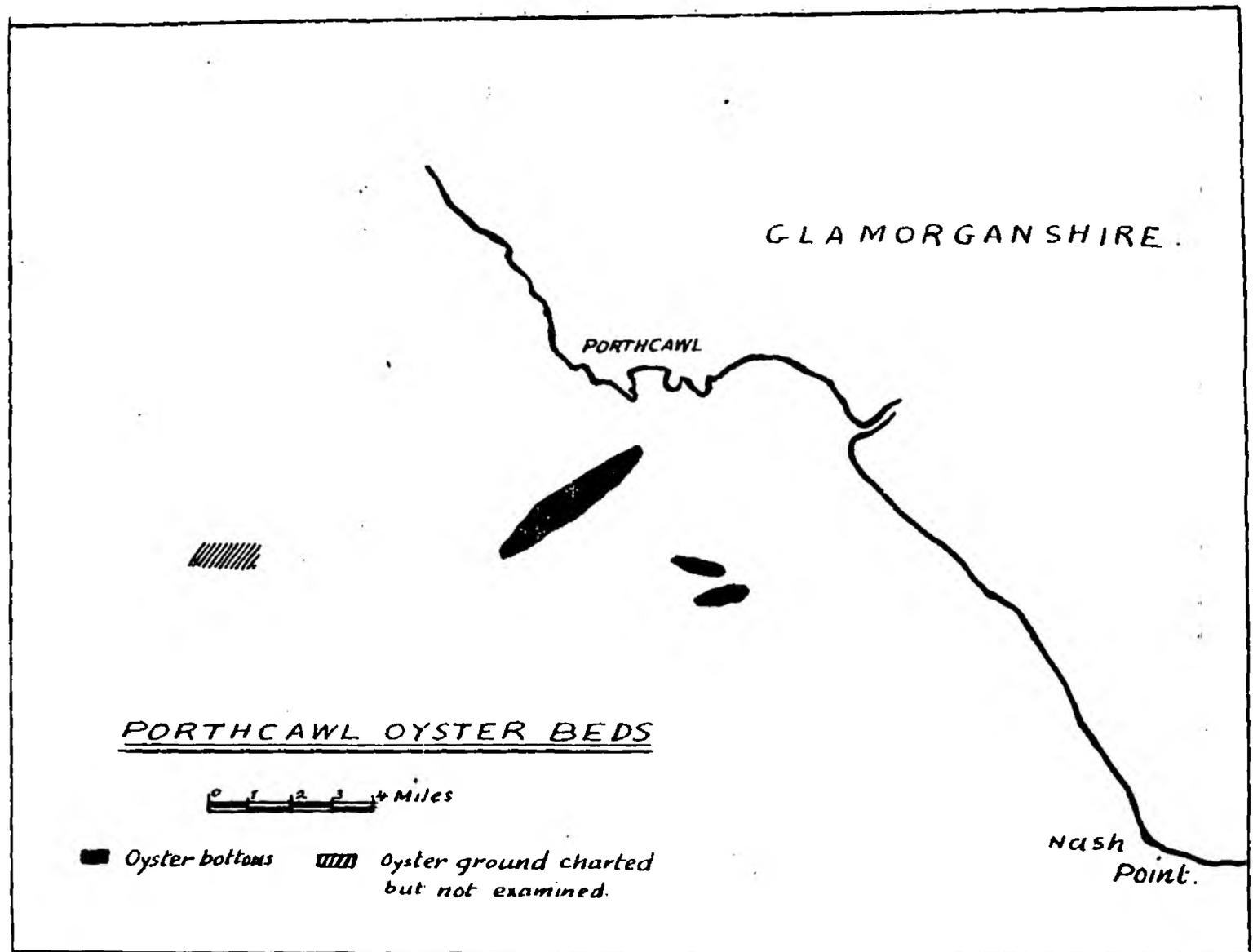


FIGURE 2

APPENDIX 1

Uses and environmental quality objectives (EQO's) for Tidal Waters (Ref. 1).

| USE | ENVIRONMENTAL QUALITY OBJECTIVE | NOTES |
|---|--|---|
| 1. Basic Amenity | Maintain water quality so as to protect public health and prevent a public nuisance arising from visual and smell problems. | |
| 2. General Ecosystem Conservation | | |
| a) For estuaries receiving no substantial effluent discharges directly or indirectly | Maintain water quality so as to protect all aquatic life and dependent non-aquatic organisms such that the ecosystem is typical of an estuary with those physical characteristics and latitude. | It is implicit that objective a) includes all the sub-objectives outlined in b) where applicable |
| | OR | |
| b) For estuaries receiving discharges | Maintain or improve water quality to such a condition that: i) it supports a variety of aquatic life and dependent non-aquatic organisms. ii) where appropriate fish and shellfish are protected. iii) where appropriate it supports a benthic fauna essential to sustain sea fisheries | |
| N.B. Specific species and habitats may need more stringent protection on a local basis because their particular value as an environmental resource. | | This will include SSSI's, RAMSAR of sites Marine Nature Reserves fisheries and shell fisheries including beds designated under the terms of the EC Shellfish Directive. |
| 3. Migratory Fish | Maintain water quality so as to protect the passage to and from freshwater of all relevant species of migratory fish where physical barriers. | To include eels but not marine species which use parts of estuaries for breeding grounds. |

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|----|---|--|--|
| 4. | Commercial Harvesting of Fish | Maintain water quality such that commercial marine fish quality shall be acceptable for human consumption as determined by the appropriate competent authorities. | This objectives relates only to the suitability for human consumption; the general health of the fish themselves is protected under objective 2) |
| 5. | Commercial Harvesting of Shellfish | Maintain water quality such that commercial shellfish quality consumption as determined by the appropriate competent authorities (eg. MAFF) | This objective relates only to the suitability for human consumption; the general health of the fish themselves is protected under objective 2) above. |
| 6. | Bathing | Maintain water quality so as to protect those engaged in bathing. | This should include those activities related to bathing. |
| 7. | Other water- contact based recreation | Maintain water quality so as to protect those engaged in water-contact related recreation. | |
| 8. | Other uses | Maintain water quality so as to protect all other recognised uses which are affected directly by water quality and which are not incorporated in other objectives. | This objective should only be applied where positive water quality management is practised by a Water Authority. For example, this would include abstractions unrelated to water quality. Neither would navigation or yachting be included here as they are protected by objective 1). |

APPENDIX 2

AESTHETIC, WATER QUALITY AND EMISSION STANDARDS, for tidal and sensitive inland waters

WATER QUALITY STANDARDS

ASSOCIATED USE/EQO

| | | |
|----------------|--|--|
| W.A.A. 1986 | Those aesthetic standards specified in EC Bathing Water Directive should be complied with and in addition there should be no recognisable sewage-derived debris such as would give rise to consistent and substantial complaint. | 1 BASIC AMENITY 6 BATHING 7 OTHER WATER BASED RECREATION |
|----------------|--|--|

EMISSION STANDARDS

ASSOCIATED USE/EQO

| | | |
|--------------------|--|-------------------------------|
| H.M.I.P. (1988) | "All flows discharged through the long sea outfall should be subject to fine screening or an equally suitable process to remove persistent sewage debris. Adequate performance is unlikely to be achieved by a mesh aperture greater than 6mm..." "... all storm discharges which directly effect bathing must be subject to fine screening... for the most frequent storms, with a lower level of screening applied to storms of a greater magnitude." | BATHING (LONG SEA OUTFALL) |
|--------------------|--|-------------------------------|

| | | |
|--|---|----------|
| WRC/WW Pre-treatment group recom- mendations (1989) | Maximum allowable faecal particle size in the effluent will be dependent upon the available minimum initial dilution at the discharge point, i.e. | ALL USES |
|--|---|----------|

| | <u>Dilution</u> | <u>Particle Size</u> |
|----|-----------------|----------------------|
| | AMID < 10 | <1mm |
| 10 | <AMID < 100 | <3mm |
| | AMID > 100 | <6mm |

| | | |
|----------------|--|----------------------------|
| HMIP (1989) | Persistent plastics are considered a listed substance hence fine screens (<6mm) should be installed to screen a level of storm intensity which will approximately correspond to treating 80% of the total volume spilled to sensitive waters (inland). The level of treatment should be demonstrated to the satisfaction of relevant regulatory staff using the appropriate data and modelling techniques. | SENSITIVE INLAND WATERS |
|----------------|--|----------------------------|

FURTHER GUIDANCE ON THE BASIC REQUIREMENTS OF DISCHARGES TO ACHIEVE AESTHETIC REQUIREMENTS IN TIDAL AND INLAND WATERS

A2.A. TIDAL WATERS

A2.A.1 BASIC AMENITY USE (EQO No.1)

Foul Flows

- a) All persistent material to be removed from the flow and disposed off site.
- b) Faecal particle size discharged will be dependent upon the available minimum initial dilution (AMID) in the receiving waters as calculated during a mean spring or neap tidal range, whichever gives the lowest value at any time during the tidal cycle:

| Dilution | Particle Size |
|-----------------|---------------|
| AMID < 10 | < 1mm |
| 10 < AMID < 100 | < 3mm |
| AMID > 100 | < 6mm |

- c) All discharges, whether preliminary treated, primary settled or secondary treated to be made below the low water mark of mean spring tides.

Storm Flows

- a) The screening level will be determined on a case by case basis taking into account the frequency and duration of the spills and the local usage of the waters.
- b) All storm discharges will be made below the low water mark of mean spring tides unless there are particular extenuating circumstances, in which case the decision on outfall location will be made on a case by case basis.

A2.A.2 WATER CONTACT BASED RECREATIONAL USE (EOO No.7)

Foul Flows

- a) All persistent material to be removed from the flow and disposed off site.
- b) Faecal particle size discharged will be dependent upon the AMID as described for Basic Amenity use.
- c) A minimum initial dilution standard of 100 will apply to all discharges, however treated, for aesthetic acceptability.

Storm Flows

- a) It will be necessary to demonstrate the expected frequency and duration of overflow spills by means of hydraulic modelling of the catchment sewer system.
- b) All storm flows equating to 80% of the total volume spilled during a typical year will require screening to < 6mm with persistent material retained and returned to foul flow for removal off the fine screens.
- c) For storm flows in excess of those treated above, the agreement of suitable screens will be on a case by case basis and dependent upon the removal efficiency of the screens. Again all screenings should be removed or returned to foul flow for removal off the fine screens.
- d) All storm discharges will be made below the low water mark of mean spring tides unless there are particular extenuating circumstances, in which case the decision of outfall location will be made on a case by case basis.

A2.A.3 BATHING USE (EOO No.6)

Foul Flows

- a) All persistent material to be removed from the flow and disposed of off site.
- b) Faecal particle size discharged will be dependent upon the AMID as described for Basic Amenity use.
- c) A minimum initial dilution standard of 100 will apply to all discharges, however treated, for aesthetic acceptability and to reduce the density stability of the diluted effluent.

Storm Flows (Discharging to or in close proximity to identified bathing waters)

- a) It will be necessary to demonstrate the expected frequency and duration of overflow spills by means of hydraulic modelling of the catchment sewer system.
- b) The frequency and duration of spills during the Bathing season (May to September) must be consistent with achieving the bacteriological standards required in the identified bathing waters. Storms with a return period in excess of 1 in 5 years can be excluded in accordance with UK interpretation of "extreme storms" in the EC Directive when failure is permitted.
- c) Both within and outside of the bathing season, all storm flows equating to 80% of the total volume expected to be spilled during a typical year will require screening to < 6mm with persistent material retained and returned to foul flow for removal off the fine screens.
- d) For storm flows in excess of those treated as above, the agreement of suitable screens will be on a case by case basis and dependent upon the removal efficiency of the screens. Again, all screenings should be removed or returned to foul flow for removal off the fine screens.
- e) All storm discharges will be made below the low water mark of mean spring tides unless there are particular extenuating circumstances, in which case the decision of outfall location will be made on a case by case basis.

A2.B. INLAND WATERS - AESTHETIC REQUIREMENTS

A2.B.1 STORM FLOWS TO SENSITIVE WATERS

- a) The decision as to the sensitivity or otherwise of the receiving waters will be decided by the NRA after appropriate consultations on a case by case basis.
- b) It will be necessary to demonstrate the expected frequency and duration of overflow spills by means of hydraulic modelling of the catchment sewer system.
- c) All storm flows equating to 80% of the total volume expected to be spilled during a typical year will require screening to < 6mm with persistent material retained and returned to the foul flow for removal off the fine screens.
- d) For storm flows in excess of those treated above, the agreement of suitable screens will be on a case by case basis and dependent upon the removal efficiency of the screens. Again, all screenings should be removed or returned to the foul flow for removal off the fine screens.

A2.B.2 STORM FLOWS TO NON-SENSITIVE WATERS

a) The screening level will be determined on a case by case basis taking into account the frequency and duration of spills and the local usage of the waters.