

Strategic Environmental Assessment

Guidance for Practitioners



SEA Topic: Water

Countryside Council for Wales



Foreword

This Guidance Note forms one of a series which covers six of the topics which need to be taken into account when undertaking Strategic Environmental Assessment (SEA) of plans and programmes. The topics covered are:

- Air
- Biodiversity
- Cultural Heritage
- Landscape
- Soil
- Water

CCW will also be producing guidance on climate change for internal use and in the specific context of Wales and CCW's remit, whilst guidance on the 'Material Assets' topic is under discussion with the DCLG and the other SEA consultation bodies.

Guidance Notes on the SEA 'Topics of Population' and 'Human Health' have not been produced as these topics are largely outside the remit of CCW.

The aim of the Guidance Notes is to highlight the key topic related issues that need to be considered by practitioners who are carrying out or providing input into SEA. The notes have been written in non-technical language in order that they are accessible to a wide audience.

The Guidance Notes have been produced for CCW by the Centre for Sustainability (C4S) with specialist input from environmental consultants ADAS for some of the topics. They have been written in consultation with the Environment Agency (Wales) and Cadw, the Welsh Assembly Government's historic environment service.

It is intended that the Notes will be updated periodically in order that they remain current and relevant, taking into account changes in legislation, guidance and baseline trends.

The authors would like to thank officers from CCW, the Environment Agency and Cadw for the topic specific input they have provided in the preparation of the Guidance Notes. They would also like to acknowledge the contributions provided by officers from DCLG and WAG in relation to the generic text and document structure, and to officers from local authorities for providing input from their perspective as potential users of the guidance.

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"This is a report commissioned by the Countryside Council for Wales. The Council has a programme of research in scientific and other areas, which supports the development of policies and practical work and helps point the way towards new countryside legislation. However, the views and recommendations presented in this report are not necessarily those of the Council and should therefore not be attributed to the Countryside Council for Wales"

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Purpose and Structure of the SEA Topic Guidance Notes

This is one in a series of guidance notes from the Countryside Council for Wales (CCW) on topics to be covered in Strategic Environmental Assessment (SEA) under the SEA Regulations for Wales¹ which implement the European Directive on SEA². The aim of these notes is to provide guidance to Welsh **Responsible Authorities** (the authorities by which, or on whose behalf the SEA is prepared) and others conducting SEA of plans and programmes, how issues related to certain SEA topics can be considered in the SEA of plans and programmes. These Guidance Notes also aim to help Responsible Authorities provide robust and sound reports which will enable CCW to comment and advise during the SEA process.

CCW provides information and advice related to the Habitats Directive and Regulations, and to protected species, designated sites including Sites of Special Scientific Interest (SSSIs) (including geological SSSIs), National Nature Reserves (NNR), Special Areas of Conservation (SAC) and candidate SACs, Special Protection Areas (SPA) and proposed SPAs.

Consultation in the SEA Process

CCW, Cadw and the Environment Agency (EA), have been designated as statutory '**Consultation Bodies**' in Wales in relation to the SEA Directive, and must be consulted at a number of stages during the SEA process (adapted from *The Practical Guide*):

- **Screening** – Determining whether a plan or programme requires SEA (NB: this is only required in a small number of cases);
- **Scoping** – Deciding on the scope, extent and level of detail of the information that must be included within the Environmental Report;
- **Reporting** – During full public consultation on the draft plan or programme and the Environmental Report; and

The advice that the Consultation Bodies aim to provide during periods of consultation is detailed in the '*Consultation Bodies' Services and Standards for Responsible Authorities in Wales*' (Environmental Agency *et al*, 2005).

NB: Where a plan or programme is likely to have significant effects on the environment in another Member State of the European Union, the SEA Directive requires that transboundary consultation should take place.

Annex 1(f) of the SEA Directive outlines the environmental topics that should be covered by the SEA process wherever relevant. These include Air, Biodiversity, Climate Change, Cultural Heritage, Human Health, Landscape, Material Assets, Population, Soil and Water. CCW is the statutory body responsible for advising on countryside, access, landscape and wildlife conservation in Wales. As regards SEA, CCW is primarily responsible for providing SEA consultation feedback and information on Biodiversity (including flora and fauna), Landscape and some aspects of Cultural Heritage issues, but also has an interest in the Soil, Water, Air, Climate Change and Material Assets topics.

Particular reference has been made to the requirements of "The SEA Regulations for the implementation of the Directive in Wales" and to the "Practical Guide to the SEA Directive" produced by ODPM³, the Administrations in Wales, Scotland and Northern Ireland (referred to hereafter as *The Practical Guide*). This guidance note uses the SEA process as set out in *The Practical Guide* as a framework for the topic-related guidance (see Figure 1).

¹ The SEA Regulations for the implementation of the Directive, 'Welsh Statutory Instrument 2004 No. 1656 (W.170): *The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004*'.

² 'Directive 2001/42/EC of the European Parliament and of the Council on the Assessment of the Effects of Certain Plans and Programmes of the Environment' (June, 2001)

³ ODPM, the Office of the Deputy Prime Minister, was superseded by DCLG, the Department for Communities and Local Government, in May 2006

Link to the Environment Strategy for Wales

The Environment Strategy for Wales was published in May 2006 and includes a series of procedural and environmental 'outcomes' which the Welsh Assembly Government aims to achieve in the period up to 2026. Many of the Environment Strategy 'outcomes' are closely linked to the SEA topics and they have indicators which will be used to measure progress towards achieving the 'outcomes'.

The Strategy is supported by an Action Plan that provides details of the actions that will be taken to deliver the Strategy. This Action Plan includes milestones and responsibilities. It is also accompanied by a policy map which identifies the various influencing factors that will help in successful implementation of the Strategy. One of the contributory tools that is listed is Strategic Environmental Assessment.

Environmental Strategy outcomes which are linked to the SEA topics include:

- Climate change (outcomes 7 & 8); Material assets (waste) (9, 10, 11 & 39);
- Material assets (resources) (12, 17 & 18); Water (13, 14, 15, 31, 32, 35 & 36);
- Soil (16); Biodiversity (19, 20, 21 & 22); Landscape (23); Cultural heritage (26);
- Air quality (33); Human health (37 & 38).

NB: There are also other outcomes which cut across more than one SEA topic.

The 'outcomes' from the Strategy could be used when developing objectives for the plan that is subject to SEA.

Where appropriate the Indicators that are included in the Strategy should be considered for incorporation into the SEA assessment and monitoring frameworks.

Environment Strategy outcomes and indicators relating to the Water topic can be seen in Table 5.

The Environment Strategy can be found at:

http://new.wales.gov.uk/topics/environmentcountryside/epq/Environment_strategy_for_wales/About_the_strategy/?lang=en



STAGE A: Setting the context and objectives, establishing the baseline and deciding the scope	A1: Identifying other relevant plans, programmes, and environmental protection objectives
	A2: Collecting baseline information
	A3: Identifying environmental problems
	A4: Developing SEA Objectives
	A5: Consulting on the scope of SEA
STAGE B: Developing and refining alternatives and assessing effects	B1: Testing the plan or programme objectives against the SEA objectives
	B2: Developing strategic alternatives
	B3: Predicting the effects of the draft plan or programme, including alternatives
	B4: Evaluating the effects of the draft plan or programme, including alternatives
	B5: Considering ways of mitigating adverse effects
	B6: Proposing measures to monitor the environmental effects of plan or programme implementation
STAGE C: Preparing the Environmental Report	C1: Preparing the Environmental Report
STAGE D: Consulting on the draft plan or programme and the Environmental Report	D1: Consulting on the draft plan or programme and the Environmental Report
	D2: Assessing significant changes
	D3: Decision making and providing information
STAGE E: Monitoring implementation of the plan or programme	E1: Developing aims and methods for monitoring
	E2: Responding to adverse effects

Figure 1: SEA Process and Stages (Adapted from *The Practical Guide*)

This Guidance Note focuses primarily on the topic specific advice at SEA Stages A, B and E and is supplementary to guidance on the SEA stages as set out in *The Practical Guide*.

Responsible Authorities should refer to *The Practical Guide* at all stages of undertaking SEA for Plans and Programmes, which sets out the SEA Directive legal requirements, procedures and methods.

See also *References and Further Reading* at the end of this note, for more topic specific information.

Water in the context of the CCW Remit

Within the SEA process in Wales, water issues will be dealt principally within consultation responses provided by the Environment Agency. However, CCW also has an interest and is concerned with water



quality and resources in the context of their role in supporting natural heritage interests, including landscape, historic landscape, flora, fauna and biodiversity. CCW places particular emphasis on the extensive areas of river catchment that are designated as Sites of Special Scientific Interest (SSSIs) and/or classified Special Areas for Conservation (SAC). CCW is involved in promoting the conservation and environmentally sustainable management of the Welsh coast and inshore waters. CCW also has an interest in Wales' man made waterways, which often supply or source some of Wales' most sensitive freshwater habitats and species. They therefore have a key role in assisting other partners (such as the Environment Agency) achieve a better environment in Wales, better known, valued and visited.

Background to the Topic: Water

There are a variety of issues that can be dealt with in the Water SEA topic. These include water and biodiversity, landscape and cultural heritage, water resources and quantity, water quality, flooding and flood risk, and recreation (including both coastal and inland waters). The applicability of these issues to individual plans and programmes will need to be considered on a case by case basis.

Water and Biodiversity, Landscape and Cultural Heritage:

Coastal and marine habitats of Wales include rocky coasts, sandy beaches, shores and estuaries. CCW is one of the bodies responsible for ensuring the conservation and environmentally sustainable management of the Welsh Coast and seas. In Wales, there is a total of 101 Natura 2000 sites (candidate SACs, possible SACs, SPAs, and candidate SPAs) designated for habitats and species that are directly dependent on the status of water (UKTAG, 2003). Seventy per cent of the length of the Welsh coastline now lies within SACs designated under the EC Habitats Directive. Based on a variety of surveys, CCW is beginning to develop landscape methodologies and policies for the coast and seas of Wales. This is in response to the fact that many of Wales' AONBs, National Parks, Special Landscape Areas and sites in the registers of Outstanding and Special Historic Landscapes (Cadw/CCW) are coastal.



Reports have been produced under the Water Framework Directive for each of the River Basin Districts (RBD) across the UK on the characterisation, impacts and economics analyses required by Article 5. These consider areas designated for the protection of habitats or species where maintaining or improving the status of water is important for their protection. They comprise the aquatic part of Natura 2000 sites designated under the Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC). As an example, Figure 2 below shows the assessment of water dependent conservation areas (Habitats Directive) in the Western Wales RBD (WAG, 2005). Maps are available for the other two RBDs relevant for Wales (Dee and Severn), and also relating to the Birds Directive. The assessment revealed that the number of water dependent conservation areas allocated within RBDs assessed as being at risk of not achieving their objectives was 66 in Western Wales, 6 in Dee, and 29 in Severn (NB: over 50% of the Severn RBD is within England).

Aquatic ecology is an important aspect for CCW, linking water and biodiversity. Where volumes and flows of water are reduced, pollutants may become concentrated. Eutrophication and acidification may affect freshwaters, consequently, having negative impacts on sensitive species of aquatic plants, fish and

invertebrates. Eutrophication occurs due to nitrogen deposition, whereas acidification is linked to deposited sulphur, nitrogen (agricultural and industrial sources), ammonia and ammonium (coming from intensively managed livestock). The Environment Agency (2005) states that whilst water quality has improved in Wales, 11% of estuaries are at risk of failing Water Framework Directive objectives due to organic pollution. Overloaded sewerage systems can lead to occasional discharges in estuaries, which can cause oxygen depletion and kill fish. Problems associated with nutrient concentrations are presently limited to two inshore waters in Wales (EA, 2005).

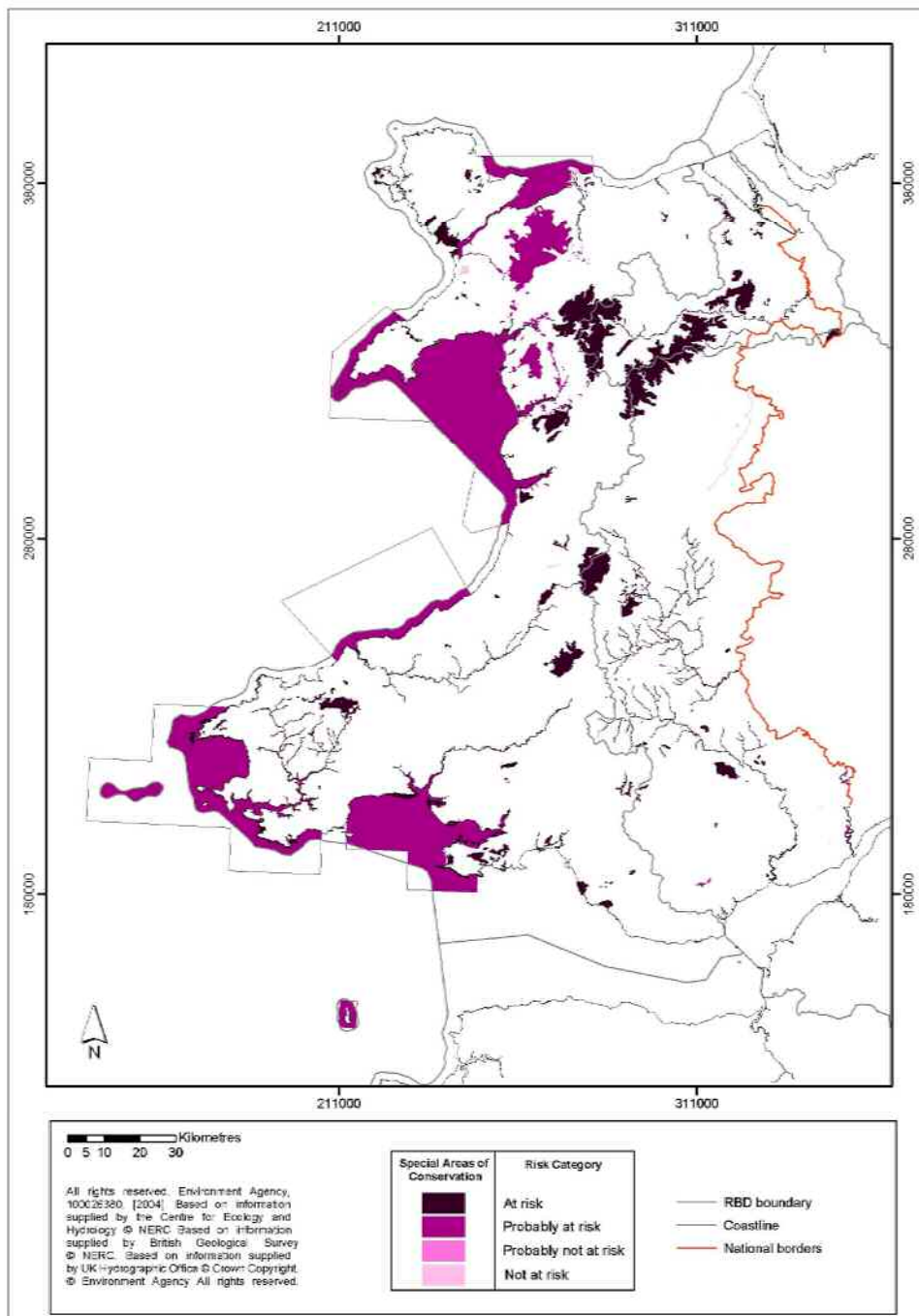


Figure 2: Assessment of water dependent conservation areas (Habitats Directive) – Western Wales (WAG, 2005)

Water Framework Directive (WFD)

The Water Framework Directive (WFD) came into force on 22nd December 2000. The WFD requires all inland and coastal waters to reach 'good status' by 2015. The WFD will:

- Improve inland and coastal waters and protect them, especially from diffuse pollution in urban and rural areas, through better land management;
- Drive wiser, more sustainable use of water as a natural resource;
- Create better habitats for wildlife that lives in and around water; and
- Create a better quality of life for everyone.

To achieve this, the WFD will establish a river basin district structure within which demanding environmental objectives will be set, including ecological targets for surface waters. The policy responsibility for implementing the WFD within the UK lies with Defra, the Scottish Executive, Welsh Assembly Government and the Department of the Environment Northern Ireland. It is anticipated that much of the implementation process will be the responsibility of competent authorities; Environment Agency (England and Wales), Scottish Environment Protection Agency (Scotland) and Environment and Heritage Service (Northern Ireland). The UK Technical Advisory Group (UKTAG) has been set up to help deliver a consistent approach to implementation of the Directive.

In terms of CCW's interests, the Directive aims to develop a framework for the protection of inland surface waters, transitional coastal waters and ground waters "which prevents further deterioration and protects and enhances the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems". Therefore the aims of the WFD are closely linked to the protection and enhancement of the status of biodiversity.

Water Resources/Quantity: Water is abstracted from rivers, reservoirs, and underground aquifers to supply the public, agriculture and industry. The availability of water resources depends on how well this abstraction is managed and the replenishment of the water resource. Although water is generally considered to be used more efficiently than previously (EA, 2006a), demand for water by the public, industry and agriculture continues to increase. This is due to three factors, including increases in the number of households, domestic appliance use and warmer weather (EA, 2006a). A quarter of an average year's effective rainfall (rainfall that reaches streams as direct runoff, or that remains in the soil and is available for consumptive use) was taken from the environment in Wales for human use in 1997.

Hydropower is the most significant water use in Wales comprising approximately 55% of the total licensed abstraction, although this is not consumptive. 24% of licensed abstracted water is direct abstraction by industry and commerce, with the majority of the remaining abstractions being for public water supply (EA, 2001). With regard to the assessment of water resources, most of the river and reservoir resources in Wales are already fully committed during the summer to meet the needs of people and the environment.

Groundwater also comprises an important aspect of the water resource. Groundwater is water that 'is



stored underground in areas of permeable rocks, known as aquifers' (EA, 2006b). These aquifers are important as they hold large volumes of water, approximately 20 times more than surface reservoirs. This underground resource needs protection from pollution, such as chemicals used in agriculture, over-abstraction and/or chemical leaks or spills. If depleted or compromised, groundwater resources may take many years to recover (depending on the geology of the area). In Wales, groundwater is not extensively used for public water supply, but is an important private source of water in some rural areas.



Water Quality: There are four major pressures on water quality. These include point and diffuse sources of nutrients and other pollutants, sanitary determinant⁴, microbiological pressures and toxic substances. The impact of these will vary depending on the water body affected, e.g. lake, river, estuary or coastal water body. Therefore the assessment should include an evaluation of the effect of pressures associated with the plan or programme, in relation to the water bodies in question.

The Assessment could provide a description of the current state of the water body. This could be based, for example, on the Environment Agency's

General Quality Assessment (GQA) Scheme which considers biological quality, chemical quality and nutrient status of water. The assessment could determine the potential impact of the plan/programme on water quality in Wales by considering its effect on the relevant Environment Quality Standard (EA, undated). These standards are established to protect wildlife, control risks to the quality of water supplies and to help ensure that our enjoyment of activities such as bathing, boating and angling are as safe as possible. Information on the EQS can be found on the Environment Agency's website: <http://www.environment-agency.gov.uk/subjects/waterquality/252005/>.

Flooding: Flooding can occur from both fluvial and coastal waters. It is not always possible to prevent flooding, but it can be anticipated and prepared for. This may involve protecting properties currently at risk, and the use of active land use planning to ensure that flood risk is reduced for future developments. Technical Advice Note (TAN) 15 *Development and Flood Risk* (WAG, 2004) advises on development and flood risk relating to sustainability principles. It provides a framework within which risks arising from both river and coastal flooding, and from additional run-off from development in any location, can be assessed. Flood risk can be increased through enlarged non-porous surfaces (inducing surface run-off) or development in areas of known or potential flooding (particularly in the vicinity of rivers and coastal areas) (EA, 2002). In England and Wales there are approximately 24,000km of flood defences. It is estimated that £150m is spent each year on improving these defences and implementing 200 new defences. The types of flood defences that are implemented include embankments, walls, weirs, sluices and pumping stations.



Although flood risk management includes the use of flood defences where appropriate, it also recognises that more 'managed flooding' is essential to meeting goals for biodiversity and to sustain good ecological status in river and coastal systems. Land use changes, including industrial development and the building of homes can have an effect on flood risk. Therefore, developments that will have an affect on flooding are discouraged. Flood management plans are being developed by the Environment Agency to address both river and sea flooding, including Catchment Flood Management Plans (CFMPs) and Shoreline Management Plans (SMPs) respectively. Both types of plan consider large areas of land, allowing the potential wider effects of flood defences in one area to be taken into account.

In addition, 'soft' defences are increasingly being implemented, including wetlands and salt marshes. These softer defences provide an area for the flood water to go, and help to reduce the impacts of waves. They also provide habitats for wildlife (EA, 2006c). Sustainable Urban Drainage Systems (SUDS), or vegetative treatment systems, may also aid the reduction in flooding through dealing with runoff close to where the rain falls, managing potential pollution at its source now and in the future, and protecting water resources from point pollution and diffuse sources, in a way that takes account of quantity, quality and amenity issues (CIRIA, 2005).

⁴ Water quality pressures arising from sewerage discharges, including ammonia, biochemical oxygen demand and suspended solids.



Recreation: Water can be considered as a great recreation source, including sporting or leisure activities (rowing, kayaking, white water rafting, bathing/swimming, angling etc). In Wales, approximately 60% of holiday-makers visit the coast. Holiday makers have been estimated to spend £4bn during seaside holidays in England and Wales (which does not include day trips for sight-seeing, walking, bathing, surfing, sailing and angling) (EA, 2005a). There are nearly 750 miles of varied coastline in Wales attracting sea anglers, and a wide variety of still-water, canal and river fisheries for those interested in coarse and game fishing (Fishing Wales, 2006).

Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope

A1: Identifying other relevant plans, programmes and environmental protection objectives

Table 1 below lists relevant plans, programmes, policies and legislation that should be taken into account in relation to SEA work on the Water topic and Table 2 provides an example of a review of one document. It should be noted that the list below is not definitive as legislation and guidelines are subject to change.

Table 1: Potential plans, programmes, objectives, policies and legislation to be taken into consideration for the Water Topic

International
<ul style="list-style-type: none"> • EU Directive Establishing a Framework for the Community Action in the Field of Water Policy (2000/60/EC) – The Water Framework Directive • EU Urban Waste Water Treatment Directive and designated Eutrophic Sensitive Areas • EU Nitrate Directive (91/676/EEC) • EU Bathing Waters Directive (76/160/EEC) • EU Environmental Liability Directive (2002/21/EC) • EC Freshwater Fish Directive (78/659/EEC) • EC Habitats and Birds Directive (92/43/EEC) • EC Shellfish Water Directive (79/923/EEC)
National
<ul style="list-style-type: none"> • Water Resources Act 1991 • Water Industry Act 1991 • Water Act 2003 • A Better Place to Play (2006) • Wales Environment Strategy (2006) • Water Resources for the Future: A Water Resources Strategy for England and Wales (2001) • TAN 14 – Coastal Planning (1998) • TAN 15 – Development and Flood Risk (2004) • Wales Environment Strategy (2006) • Cleaner Coasts Healthier Seas – Strategy (EA, 2005) • Waterways for Wales – The Way Forward (2000) • Integrated Coastal Zone Management Strategy (Draft 2006) • National Salmon Strategy (1996) • EA Drought Management Plan for Wales (2003) • Better Fisheries for Our Nation (EA, 2006)
Regional/Local
<ul style="list-style-type: none"> • Shoreline Management Plans • River Basin Management Plans – Western Wales, Severn, Dee • Catchment Flood Management Plans

- Catchment Abstraction Management Strategies
- Water Level Management Plans
- Flood Risk Management Strategies
- Salmon Action Plans
- Drought Management Plans
- Water Resource Management Plans
- Special Areas of Conservation (SAC) Management Plans for Natura 2000 Sites

Table 2: Example of review of other relevant plans, programmes, objectives etc

EU Directive Establishing a Framework for the Community Action in the Field of Water Policy (2000/60/EC) – The Water Framework Directive	
<p>Article 4 (1a) requires all Member States to aim to achieve ‘good ecological status’ of inland water bodies by 2015, and limits the quantity of groundwater abstraction to that portion of overall recharge not needed by ecology. Article 4 (1b) requires member states to aim to achieve good groundwater status before 2015, which included ensuring “no significant damage” to terrestrial ecosystems directly dependent on the groundwater body” (Annex V paragraph 2).</p> <p>Article 4 (1c) states “In making operational the programmes of measures specified in the river basin management plans, for Protected Areas, Member States shall achieve compliance with any standards and objectives set for each Protected Area by 22 December 2015, unless otherwise specified in the Community legislation under which the Protected Area was established”. This obligation pertains to any N2K protected Areas submitted on the register of protected areas established under Article 6 (See map referred to earlier).</p>	
Objectives, requirements and targets	Implications for Plan or Programme
To achieve ‘good ecological status’ of inland water bodies by 2015.	The Plan should aim to contribute to the objectives of the Water Framework Directive by minimising negative impacts on water resources. The plan should also aim to prevent any adverse impacts to water dependent Natura 2000 site features, such as would prevent the achievement of any standards or objectives for those features

Informal consultation, with statutory consultees (referred to here as ‘Consultation Bodies’) and non-statutory consultees, is also a useful tool for identifying relevant plans, programmes, objectives etc (see Stage A5 for more information on consultation).

A2: Collecting Baseline Information

Box 1 below describes some potential sources of baseline data for the Water topic. Box 2 provides some key facts and figures about this topic. Once again, consultation bodies and non-statutory consultees may be good sources of data.

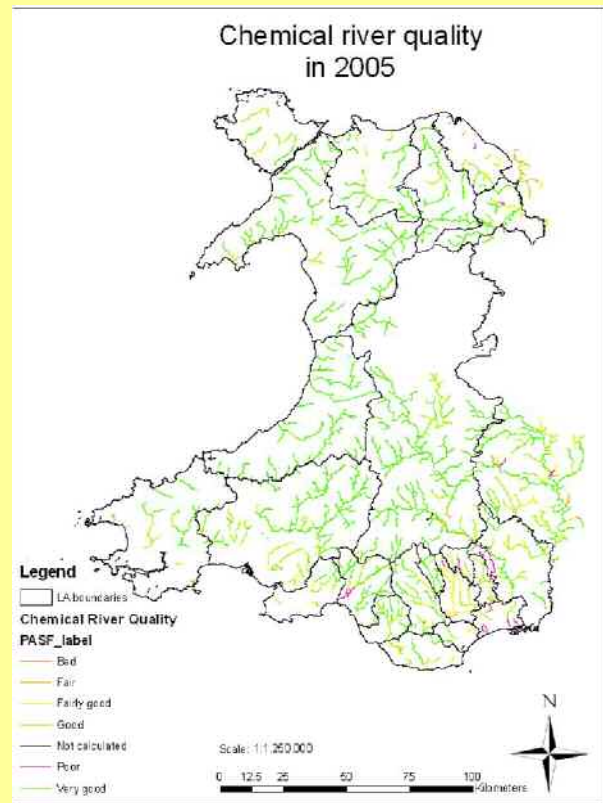
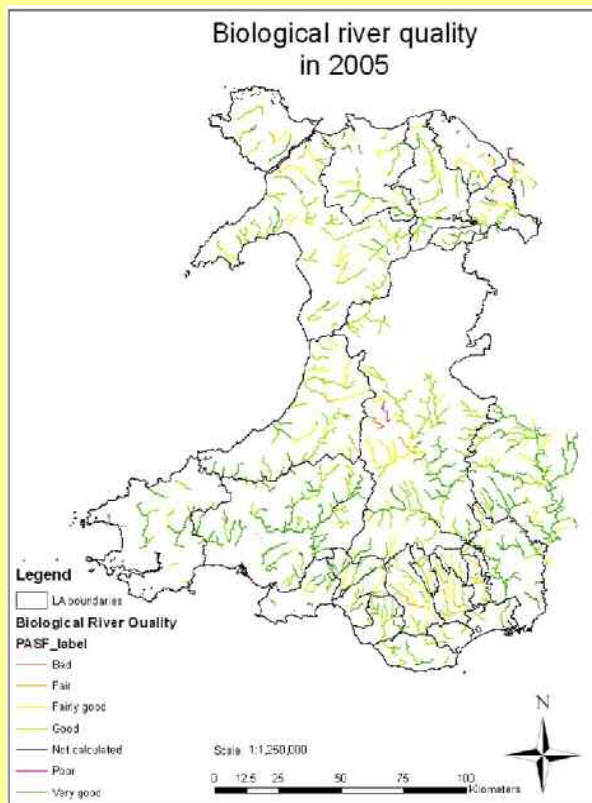
Box 1: Relevant and Appropriate Sources of Baseline Data – Water

National and regional water quality/resources data:

- National Assembly for Wales, ‘Key Environmental Statistics’: www.wales.gov.uk (river quality: biological and chemical; bathing water; and drinking water)
- DEFRA: www.defra.gov.uk (inland water statistics – quality and use, leakage, abstraction drinking water quality)
- Water Framework Directive River Basin Characterisation data (Western Wales, Dee and Severn River Basin Districts):
<http://www.defra.gov.uk/environment/water/wfd/article5/index.htm>
- Welsh Assembly Government, ‘A Living and Working Environment for Wales: The State of the Welsh Environment 2003’: www.wales.gov.uk
- Environment Agency: www.environment-agency.gov.uk (flood risk maps, river flows, water quality)

Box 2: Wales Water Facts and Figures

- Wales is often considered to have abundant water resources because of its high annual rainfall. Over much of the country however, there is little spare water. Most river and reservoir water resources are already fully committed during the summer to meet the needs of people and the natural heritage. Consequently, water resources can become limited whenever there are extended dry periods (NAW, 2006; EA, 2001). In some cases, water resources are already over committed and are being assessed by the Environment Agency's 'Restoring Sustainable Abstraction Programme'.
- The largest supplier of water in Wales, Dwr Cymru, states water demand as being 154 litres (unmeasured water) and 129 litres (measured water) per person per day. Both water demand figures are lower than the average for England Wales, which are 155 litres (unmeasured) and 136 litres (measured) per person per day.



Source: Environment Agency

- Water Quality in Wales (2004) was very good with 98.4% and 99.1% of river length being in good or fair condition respectively (NAW, 2006). 12,000km of Welsh streams and rivers remain acidified due to acidic deposition (partly from air borne sulphur compounds from industry and transport) (WAG, 2003).
- All Welsh bathing waters comply with EU mandatory bacterial standards and 91% comply with more stringent standards set out in the EU Bathing Water Directive (NAW, 2006).
- There were 1,816 substantiated water pollution incidents in Wales in 2001. 23% stemmed from sewerage, 16% from oils and fuels, and 10% from agriculture. (WAG, 2003).
- Wales' landscape, soils and geology provide few natural stores, meaning that supplies can become scarce during extended dry periods (WAG, 2003).
- Approximately 140,000 properties in Wales (12% of housing stock) are thought to be at risk of flooding by seas or rivers (Defra, 2004).

A3: Identifying Environmental Issues and Opportunities

Environmental issues and opportunities are identified following the work undertaken in stages A1 and A2 and stage A3 often benefits from stakeholder workshops. Table 3 provides examples of various Water issues in Wales and their trends, based on available baseline information.

Table 3: Examples of Water Issues in Wales

Water Issue Affecting Wales	Description
River Quality (Chemical and Biological)	<ul style="list-style-type: none"> The proportion of river lengths in Wales of good chemical quality has consistently been 90% or higher in recent years. In 2004 it was 94.4% compared with 92.5% in 2003 (NAW, 2006). In 2004 79.4% of river lengths in Wales were of good biological quality, similar to the result in 2003, which was 79.3% (NAW, 2006). The main pressure on freshwater resources comes from nutrient enrichment, run-off, soil erosion, industrial pollution, acidification, water abstraction and climate change (WAG, 2003).
Development and Flood Risk	<ul style="list-style-type: none"> New development is still occurring on the flood plain in some areas of Wales. Detailed Flood Risk Assessments could be required for developments in these locations. New concepts regarding flood risk management, such as 'Making Space for Water', real time flood warning and risk based approaches, could be applied.
Development and Water Resources	<ul style="list-style-type: none"> Water capacity issues are not always being considered when new developments (including cross border developments in England) are being planned. Water efficiency measures in new developments are essential to ensure water supply is sustainable in the long term. New development should only be undertaken within existing water resources and treatment capacities.
Seasonality and Water Resources	<ul style="list-style-type: none"> Seasonality can affect the capacity of water resources in Wales.
Climate Change and Water	<ul style="list-style-type: none"> Climate change is significantly altering the marine environment and affecting the populations of marine life (EA, 2005b). Coastal erosion, flood risk and habitat loss are increasing concerns. Climate change is likely to impact on the seasonal availability of water resources and water demand.



Table 4 below is a non-exhaustive list of potential Water-related environmental issues that plan-makers may identify in the preparation of various plans and programmes.

Table 4: Potential Water-Related Environmental Issues and Opportunities

Type of Plan or Programme	Potential Water-Related Issues and Opportunities
Transport	<ul style="list-style-type: none"> Infrastructure development can increase the area of non-porous surface, increasing pollution/contamination of water bodies and flood risk (as a result of climate change/increases in traffic).
Urban expansion / new development	<ul style="list-style-type: none"> Development can place pressures on local/regional water resources (quantity), but also increase surface run-off through increases in non-permeable surfaces, leading to pollution or contamination of existing sources. This is relevant not only for drinking water sources, but also for water bodies which have other conservation, recreation or economic value. New development can also negatively affect the biodiversity, landscape and cultural heritage aspects of water bodies. Development on flood plains can result in a reduction in flood storage capacity. Plans or programmes can ensure that development does not take place within flood zones, thereby reducing flood risk. With development comes the need for increased wastewater treatment. Pressure is placed on existing infrastructure and the need for new infrastructure. Plans and programmes can encourage water efficiency measures in new developments. Plans and programmes can encourage use of SUDS in new developments.
Mineral	<ul style="list-style-type: none"> Mineral excavation can create water habitats, recreational opportunities, and water storage. The excavation of minerals also has the potential to damage wetland habitats, and affect the integrity of river corridors. Mineral and gravel excavation can have an impact on groundwater levels, which in turn can have an adverse effect on surface water flows. Metal mining sites present significant sources of water contamination (EA, 2002). Abandoned coal mines may lead to acid mine drainage.
Waste Management	<ul style="list-style-type: none"> Landfill sites and waste management processes may lead to the contamination of water sources.
Agriculture / Forestry / Fisheries	<ul style="list-style-type: none"> Nitrates and other chemicals from agricultural processes can find their way into water resources and affect quality. Water efficient farming practices can reduce the use of clean water and reduce the quantity of foul water requiring treatment and disposal. Storage reservoirs can reduce pressure on (public) water resources in periods of drought. Woodland creation can improve rainfall infiltration and help to reduce nutrient run-off into water courses. Logs and branches from forestry can block rivers and bridges and exacerbate flood problems.
Energy / Industry	<ul style="list-style-type: none"> Hydro power places additional pressures on the use of water.
Tourism	<ul style="list-style-type: none"> Tourism may place increased pressures on the demand for water in certain areas. Water resources, including coastal and inland water resources, are often viewed as important recreational resources. Tourism may affect the biodiversity, landscape and cultural heritage aspects of water bodies.
Water and Flood Management	<ul style="list-style-type: none"> Water and flood management plans have potential to positively affect the quality and quantity of water resources.

A4: Developing SEA Objectives

SEA Objectives are not a legal requirement but are a useful way of analysing the environmental affects of a plan or programme. Table 5 and Table 6 below describe some possible landscape-related outcomes, objectives, sub-objectives and indicators. Those in Table 5 have been taken from the Wales Environment Strategy, with Table 6 providing a wider range which could be used in sector or area specific SEAs.

Table 5: Wales Environment Strategy Outcomes and Indicators: Water

Environmental Strategy Outcomes	Environmental Strategy Indicators
Water resources are managed sustainably meeting the needs of society without causing damage to the environment Timeline: By 2009/10	<ul style="list-style-type: none"> • Level of leakage • Number of water resource zones meeting target headroom requirements • Possible indicators of changes in river flows and of water availability to be explored
Water is used more efficiently across all sectors	<ul style="list-style-type: none"> • Per capita consumption of water • Volume of water abstracted from the environment • Revised indicators will be selected following completion of work by Environment Agency
The high quality of our drinking water is maintained	<ul style="list-style-type: none"> • Compliance with standards for public drinking water • Compliance with standards for private water supplies tested annually
Appropriate measures will be in place to manage the risk of flooding from rivers and the sea and help adapt to climate change impacts	<ul style="list-style-type: none"> • Annual cost of damage due to flooding • Probability of flooding of assets at risk • Indicator of percentage of new development permitted in the floodplain to be developed
Everyone who lives in a flood risk area will understand the flood risk they are subject to, the consequences of that risk and how to live with that risk	<ul style="list-style-type: none"> • Level of use of Floodline • Households registered for flood warnings as a percentage of total number of households at risk of flooding • Indicators of trends in awareness of flood risk to be developed based on a new survey
The quality of our groundwater, rivers, lakes and coastal waters is maintained and enhanced	<ul style="list-style-type: none"> • River water quality – biological and chemical • Bathing water quality • Compliance with 'good status' under the Water Framework Directive in due course
Diffuse pollution is better understood and action is being taken to reduce and manage diffuse pollution	<ul style="list-style-type: none"> • River water quality – biological and chemical • Bathing water quality • Compliance with 'good status' under the Water Framework Directive in due course • Area of Wales designated as nitrate vulnerable zones

Table 6: Examples of SEA Objectives/Sub-Objectives and Indicators for Water

Example Objectives (in bold) and Sub-Objectives (in italics)	Example Indicators
Minimise the adverse effects of land-use on inland and coastal water resource quantity and quality and reduce flood risk.	See sub-objective indicators below
<i>Recreation</i>	
<i>Ensure the quality of water resources for recreational activities</i>	<ul style="list-style-type: none"> Percentage of bathing waters meeting the requirements of the Bathing Waters Directive The number of beaches which meet the requirements of the Green Sea Partnership for both beach and water quality Number of bathing waters at risk
<i>Water Quality</i>	
<i>Improve water quality of rivers, lakes, ground-waters and coastal areas</i>	<ul style="list-style-type: none"> The percentage of river lengths of good chemical or biological quality (NAW, 2006) Percentage of waters restored to Good Ecological Status Number of substantiated water pollution incidents Percentage of bathing waters which meet the EC mandatory standards The number of beaches which meet the requirements of the Green Sea Partnership for both beach and water quality
<i>Encourage water management to be considered internally and across borders</i>	<ul style="list-style-type: none"> Annual amount of water transferred across the border to England Inter river/catchment transfer in Wales
<i>Minimise diffuse pollution from urban and rural areas</i>	<ul style="list-style-type: none"> Number of substantiated water pollution incidents
<i>Water Quantity</i>	
<i>Ensure water resources are sustainably managed, meeting the needs of society without compromising or causing damage to the environment.</i>	<ul style="list-style-type: none"> Percentage of properties with water meters Per capita consumption of water Area where there is an unsustainable abstraction from groundwater Area where there is an unsustainable abstraction from surface waters Number of exceedances of abstraction licence limits
<i>Increase water efficiency, e.g. in new, refurbished and existing developments</i>	<ul style="list-style-type: none"> Percentage of properties with water meters Level of leakage from water infrastructure Number of grey water recycling schemes Percentage of developments with Sustainable Drainage Systems (SUDS)
<i>Flooding</i>	
Minimise flood risk and ensure new development does not increase flood risk	<ul style="list-style-type: none"> Annual cost of damage due to flooding Percentage of new development permitted in floodplains Number of developments built contrary to EA advice Households registered for flood warnings as a percentage of total number of households at risk of flooding Proportion of transport network protected against future flood risk Level of use of Floodline

Link to Welsh Assembly Government Sustainable Development (SD) Indicators

As part of its commitment to achieving sustainable development the Welsh Assembly Government has developed a series of indicators which will be used to measure progress towards that commitment⁵.

Some of these indicators may not be suitable for many SEAs, particularly those for plans at a local level, as they are fairly 'broad-brush' and will not be able to either be measured at a local level, or respond to the policies and measures included within individual plans and programmes. Nevertheless they should be considered for inclusion wherever appropriate.

NB: a revised set of indicators is currently being developed and some of these are likely to be more appropriate for incorporation into SEAs.

Other indicators reported by the Welsh Assembly Government at a national level include those in the Environment Strategy (WAG, 2006) and those from the Key Environment Statistics Indicators.

WAG reports each year on its suite of sustainable development indicators, some of which include environmental indicators. It also reports separately on progress in implementing its Environment Strategy using a number of ES indicators, some of which overlap with its suite of SD Indicators. These reporting mechanisms provide useful data which can be used to inform SEA scoping and environmental reports. They also help to form a framework against which environmental indicators for the plan or programme can be developed.

A5: Consulting on the Scope of SEA

In addition to the three statutory Consultation Bodies (CCW, Cadw and EA) there are other organisations or bodies who could be consulted on the scope of the SEA, and on the Environmental Report. For the Water topic, these may include:

- Water companies;
- Other trade associations, e.g. National Farmers Union;
- Water recreation organisations (sports, angling);
- Wales Maritime and Coastal Partnership;
- Integrated Coastal Zone Management (ICZM) Groups (Coastal Defence groups, cSAC/pSPA relevant Authority groups, coastal forums, estuary partnerships);
- NGOs e.g. the RSPB and other members of the Wales Environment Link;
- Angling and Fisheries Associations; and
- Local Authorities receiving water resources originating in Wales.

Stage B: Developing and Refining Alternatives and Assessing Effects

The Practical Guide provides guidance for undertaking SEA Stages B1 (Testing the plan or programme objectives against the SEA objectives), B2 (Developing strategic alternatives) and B3 (Predicting the effects of the draft plan or programme, including alternatives). This note provides no topic specific guidance for these stages.

B4: Evaluating the effects of the draft plan or programme, including alternatives

At Stage B4 the significance of the environmental effects forecast in Stage B3 is evaluated. Part of this concerns the interrelationship of the landscape topic with other SEA topics and Table 7 below describes some of these interrelationships.

⁵ Sustainable Development Indicators for Wales can be found at:
<http://new.wales.gov.uk/topics/statistics/headlines/sustain-2007/?lang=en>

Table 7: Interrelationships with other SEA topics

SEA Topic	Interrelationship with Water Topic
Air Quality	<ul style="list-style-type: none"> • Pollutants in the atmosphere can be deposited in water resources, leading to contamination.
Biodiversity	<ul style="list-style-type: none"> • The quality of Wales' water resources, waterways and coastlines will have a direct effect on certain biodiversity species.
Climate Change	<ul style="list-style-type: none"> • Changes in rainfall patterns and amounts can affect water availability for people and use within the environment. Therefore climate change and change are of great significance to water resources. • Climate change could also influence the demand for water (e.g. during warmer periods) and the potential for flooding.
Cultural Heritage	<ul style="list-style-type: none"> • Changes in the water table may affect the preservation of archaeological remains in soils. • Flooding may potentially affect historic and cultural assets, particularly in low lying and coastal areas.
Human Health	<ul style="list-style-type: none"> • Bathing water quality can affect the health of people using water resources for recreational purposes. • Drinking water quality also has potential considerations for human health. • Water supply and water waste treatment can affect the health of Wales' population.
Landscape	<ul style="list-style-type: none"> • Fresh and coastal waters are important in terms of the quality of the Welsh landscapes and seascapes.
Population	<ul style="list-style-type: none"> • Homes may be at risk due to coastal and river flooding in some areas of Wales.
Soil	<ul style="list-style-type: none"> • Soil acts as a filter to remove substances from water, and can receive and transform particles (pollutants) from the atmosphere. • Soil can also regulate the flow of water from rainfall to watercourses, aquifers, vegetation and the atmosphere. • Soil acts as a natural reservoir for water. Construction phases of a development may involve soil stripping and storage – at this stage, soil may suffer erosion from surface water run-off. • Poorly stored soil may be more liable to erosion by water or wind. • Contamination of soil can impact on water quality, through run-off; urbanisation (reducing open land surfaces) and can affect run-off volumes, hence causing increased flooding.

Stage C: Preparing the Environmental Report

Refer to *The Practical Guide* for details relating to SEA Stage C.

Stage D: Consulting on the Draft Plan or Programme and the Environmental Report

Refer to *The Practical Guide* for details relating to SEA Stage D.

Stage E: Monitoring Implementation of the Plan or Programme

Whilst generic guidance on SEA Stage E is provided in *The Practical Guide*, some topic specific information of relevance to Stage A2 is provided below.

NB: many of the examples provided could be used not just when responding to adverse effects, but also to enhance the environmental outcomes of a plan from the outset.

E2: Responding to Adverse Effects

Plans can be used to deliver responses to adverse effects identified during SEA in a variety of ways. Specific examples of responses relevant to the Water topic include:

- Take into account the requirements of the Water Framework Directive, and establish links with River Basin Management Plans, Catchment Flood Management Plans and Water Resources Plans;
- Encourage higher water efficiency and help to reduce the demand for water;
- Set the framework for reducing acid and nitrogen deposition to reduce acidification and eutrophication of water courses;
- Consider the effects of flooding e.g. through the application of strategic and site specific flood risk mapping;
- Protect floodplains and prevent development that would create an unacceptable increase in flood risk;
- Avoid developments in areas prone to flooding and ensure that flood warning systems are appropriately funded and effective;
- Promote the use of Sustainable Urban Drainage Systems (SUDS);
- Ensure that adequate water and waste water infrastructure are in place before developments are brought into use;
- Resist developments that would rely on additional flood defences that could adversely affect the environment or which would prejudice the ability of coastal features and processes to form natural sea defences; and
- Encourage sustainable use of and access to coastal areas and river corridors for recreation through restoration and enhancement and by ensuring that natural functions are protected.

References and Further Reading

SEA and Generic References:

- ODPM, Scottish Executive, Welsh Assembly Government and Department of the Environment in Northern Ireland (2005) *A Practical Guide to the Strategic Environmental Assessment Directive*, TSO, UK.
- NAW (2006) *Local Development Plan Manual*, National Assembly for Wales, UK.
- DfT (2004) *Strategic Environmental Assessment for Local Transport Plans*, TAG Unit 2.11, TSO, UK. Available at URL: www.webtag.org.uk/webdocuments/2_Project_Manager/11_SEA/
- ODPM (2005) *Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents*, TSO, UK (Sustainability Appraisal includes SEA).
- Welsh Statutory Instrument 2004 No. 1656 (W.170): *The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004*.
- Environment Agency (2007) *Web-based Advice on SEA and Good Practice*. Available at URL: <http://www.environment-agency.gov.uk/aboutus/512398/1504325/1504417/?version=1&lang=e>
- Environment Agency Wales, Welsh Assembly Government, Cadw, and CCW (2005) *Strategic Environmental Assessment: Consultation Bodies' Services and Standards for Responsible Authorities in Wales*. Available at URL: <http://www.cadw.wales.gov.uk/upload/resourcepool/WalesS&Senglish6943.pdf>
- Countryside Agency, English Heritage, English Nature and Environment Agency (2005) *Environmental Quality in Spatial Planning*. Available at URL: http://www.english-heritage.org.uk/upload/pdf/Envir_Quality.pdf#search=%22environmental%20quality%20in%20spatial%20planning%22

Topic Specific References and Further Reading:

- British Waterways (2006) *Waterways for Wales: Improved Quality of Life through the Sustainable Development of the Waterways of Wales*, British Waterways, UK. Available at URL: [http://www.britishwaterways.co.uk/images/Waterways_for_Wales_\(Eng\)_tcm6-71758.pdf](http://www.britishwaterways.co.uk/images/Waterways_for_Wales_(Eng)_tcm6-71758.pdf)
- Countryside Agency, English Heritage, English Nature and Environment Agency (2005) *Environmental Quality in Spatial Planning*. Available at URL: http://www.english-heritage.org.uk/upload/pdf/Envir_Quality.pdf#search=%22environmental%20quality%20in%20spatial%20planning%22
- CIRIA (2005) *Sustainable Urban Drainage Systems: Background*, CIRIA, UK. Available at URL: <http://www.ciria.org/suds/background.htm>
- Defra (2004) *E-Digest Statistics about: Inland Water Quality and Use: Freshwater Quality*, Defra, UK. Available at URL: <http://www.defra.gov.uk/environment/statistics/inlwater/iwecfish.htm>
- EA (2001) *Water Resources for the Future: A Summary of the Strategy for Wales*, Environment Agency, UK.
- Environment Agency (EA) (2002) *Metal Mine Strategy for Wales*. Available at URL: <http://www.environment-agency.gov.uk/regions/wales/426317/393155/?version=1&lang=e>
- EA (2002) *Effective Flood Management: Position Statement*, Environment Agency. Available at URL: <http://www.environment-agency.gov.uk/aboutus/512398/289428/656297/?version=1&lang=e>
- EA (2005a) *Cleaner Coasts, Healthier Seas: The State of the Marine Environment of England and Wales*, Environment Agency, UK.
- EA (2005b) *Cleaner Coasts, Healthier Seas: Working for a Better Marine Environment: Our Strategy 2005-2011*, Environment Agency, UK.
- Environment Agency (2005c) *A Better Place? State of the Environment 2005*, Environment Agency, Bristol.
- EA (2005d) *Water Resources for the Future: A Summary Strategy for Wales*, Environment Agency, UK.

- EA (2006a) *Water Resources and Abstraction*, Environment Agency. Available at URL: <http://www.environment-agency.gov.uk/yourenv/eff/1190084/water/213872/609264/?version=1&lang=e>
- EA (2006b) *Groundwater*, Environment Agency. Available at URL: <http://www.environment-agency.gov.uk/yourenv/eff/1190084/water/213872/groundwater/?version=1&lang=e>
- EA (2006c) *Managing Flood Risk*, Environment Agency. Available at URL: <http://www.environment-agency.gov.uk/subjects/flood/1217883/?version=1&lang=e>
- EA (2006d) *A Better Environment, Healthier Fisheries: Better Fisheries for Our Nation, Our Strategy for 2006-2011*, Environment Agency, UK.
- EA (Undated) *Environmental Quality Standards*, Environment Agency, UK. Available at URL: <http://www.environment-agency.gov.uk/subjects/waterquality/252005/>
- Fishing Wales (2006) *Fishing Wales*. Available at URL: www.fishing.visitwales.com
- National Assembly for Wales - NAW (2006) *Key Environment Statistics for Wales*, Statistical Directorate National Assembly for Wales, Cardiff. Available at URL: <http://new.wales.gov.uk/topics/statistics> (>Headlines, Releases and Bulletins > Environment)
- RCEP (2002) *Environmental Planning: Summary of the Royal Commission on Environmental Pollution Report*, RCEP, London.
- UK Parliament Select Committee on Science and Technology (2006) *Eighth Report*. Available at URL: <http://www.publications.parliament.uk/pa/ld200506/ldselect/ldsctech/191/19102.htm>
- UKTAG (2003) *Guidance on the Identification of Natura Protected Areas*, UK Technical Advisory Group on the Water Framework Directive, UK. Available at URL: http://www.wfduk.org/tag_guidance/Article_06-07/TAG2003%20WP4a%20PR03%29
- Welsh Assembly Government – WAG (2003) *A living and working environment for Wales: the state of the Welsh Environment 2003*, WAG, Cardiff, Wales.
- Welsh Assembly Government – WAG (2004) *Technical Advice Note (TAN) 15 - Development and Flood Risk*, WAG, UK. Available at URL: <http://wales.gov.uk/about/departments/depc/epcpublications/PlanPubs/TAN/?lang=en>
- Welsh Assembly Government - WAG (2005) *Water Framework Directive: Maps to Support the Summary Report of the Characterisation, Impacts and Economics Analyses required by Article 5: Western Wales River Basin District*, Welsh Assembly Government, UK. Available at URL: <http://www.defra.gov.uk/environment/water/wfd/pdf/westernwalesmaps.pdf>