

Planning for Hydropower: a Good Practice Guide

Draft for consultation – responses due by 13th January 2012



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Prepared for Climate East Midlands and the Environment Agency
by AMEC Environment & Infrastructure UK Limited

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1. Introduction

The draft Planning for Hydropower: A Good Practice Guide has been produced by AMEC on behalf of Climate East Midlands, as part of the East Midlands Skills Programme, and is jointly funded by the Environment Agency. It is being developed to help local planning authorities, the Environment Agency, developers and other stakeholders better understand the complex planning issues associated with hydropower schemes in the East Midlands Region (and elsewhere in England) and to encourage a more joined-up approach to determining applications for their deployment.

The Guide builds on initial consultation undertaken with local planning authority officers, Environment Agency staff and other stakeholders in the East Midlands region which culminated in a scoping workshop held in September 2011. The Guide is now being disseminated as a draft for consultation and your comments will inform the final version of the Guide which is due to be published in early 2012. Comments should be sent by 13th January 2012 to the address shown at the end of this chapter.

What is small-scale hydropower?

Hydropower harnesses the energy from water flowing from a higher to a lower level using a turbine to generate electricity. Most hydropower schemes abstract water from a river behind a weir (sometimes a reservoir dam) and then return the water to the same river. The amount of electricity produced depends on the volume of water and the distance it falls. Most schemes have a generating capacity of less than 500 kilowatts (kW), although a few sites may have the potential to generate up to 1 megawatt (MW). Schemes with an output below 100kW are generally regarded as ‘micro-hydropower’ schemes, while those from 100kW to 500kW are regarded as ‘small’ schemes.

Why is hydropower needed?

The UK Climate Change Act 2008 set a target of at least an 80% reduction in greenhouse gas emissions by 2050 with an interim target of a 34% reduction by 2020 (from 1990 levels). The Coalition Government’s UK Renewable Energy Roadmap¹ reaffirms these targets.

To achieve greenhouse gas emission reduction targets, the 2009 Renewable Energy Strategy² suggests that by 2020 about 30% or more of electricity could come from renewable sources, compared to around 6.7% today.

Hydropower is highlighted as being expected to make a limited but important contribution to renewable electricity generation.

In 2010, the installed capacity of small-scale hydropower schemes in the UK³ stood at 195MW. Whilst this constitutes only a small proportion (2%) of total installed renewable electricity capacity, electricity generated each year from small-scale hydropower schemes has increased significantly since 2004 from 283GWh to 511GWh (see Figure 1).

¹ Department of Energy and Climate Change (2011) UK Renewable Energy Roadmap

² HM Government (2009) The UK Renewable Energy Strategy

³ Department of Energy and Climate Change (2011) Renewables Statistics, available on-line via http://www.decc.gov.uk/en/content/cms/statistics/energy_stats/source/renewables/renewables.aspx

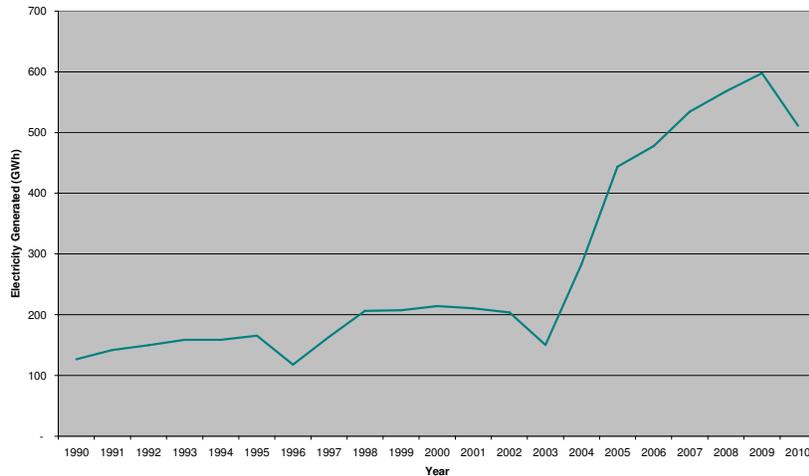


Figure 1: Electricity generated from small-scale hydropower schemes – 1990 to 2010

Research⁴ published by the Environment Agency identified over 25000 barriers on rivers in England and Wales with a theoretical capacity to generate up to 1,178MW or approximately 1% of the UK's total projected electricity demand by 2020. Realistically, this potential will be much lower due to practical constraints, such as access to the local electricity distribution network and environmental impacts and a further study by the British Hydropower Association and IT Power for the Department of

Energy and Climate Change (DECC)⁵, with a greater focus on characteristics of individual sites, concluded that the potential was between 146MW and 248MW. While satisfying only a relatively small proportion of total projected electricity demand, hydropower remains a reliable, clean and proven technology and is attractive to local communities.

Further, whilst the current pipeline of renewable electricity projects is healthy, significant uncertainties remain, meaning that if the Government's targets are to be met, all available renewable energy sources will have to be exploited to their maximum sustainable potential.

Advantages of Small-Scale Hydropower

The British Hydropower Association identifies the following advantages over other forms of renewable technologies:

- A high efficiency (70 - 90%), by far the best of all energy technologies.
- A high capacity factor (typically >50%), compared with 10% for solar and 30% for wind.
- A high level of predictability, varying with annual rainfall patterns.
- Slow rate of change; the output power varies only gradually from day to day (not from minute to minute).
- A good correlation with demand i.e. output is maximum in winter.
- It uses a long-lasting and robust technology; systems can readily be engineered to last for 50 years or more.

⁴ Environment Agency (2010) Opportunity and environmental sensitivity mapping for hydropower in England and Wales.

⁵ DECC and Welsh Assembly Government (2010) England and Wales Hydropower Resource Assessment. Final Report. Report for DECC and WAG by the British Hydropower Association and IT Power.

What is the planning context?

National planning policy on renewables (in England) is currently set out in Planning Policy Statement 22: Renewable Energy (PPS22). This encourages positive planning for renewable energy development and states that small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally.

Existing national planning policy including PPS22 is due to be replaced by the National Planning Policy Framework (NPPF). The draft NPPF sets out that the Government's objective is for planning to fully support the transition to a low carbon economy. It states that planning should:

“secure, consistent with the Government’s published objectives, radical reductions in greenhouse gas emissions, through the appropriate location and layout of new development, and active support for energy efficiency improvements to existing buildings and the delivery of renewable and low-carbon energy infrastructure.”

Further information relating to the planning policy context is provided at **Appendix A**.

Although the Environment Agency is the designated competent authority for implementation of the Water Framework Directive, local planning authorities also have responsibilities for implementation of some of the actions defined in River Basin Management Plans and have a statutory duty to have regard to River Basin Management Plans in exercising their planning powers. For hydropower schemes, this means ensuring that the development will not compromise the ability to achieve:

- the environmental objectives of the River Basin Management Plan;
- good ecological status or potential of the water body; and
- no deterioration in water body status.

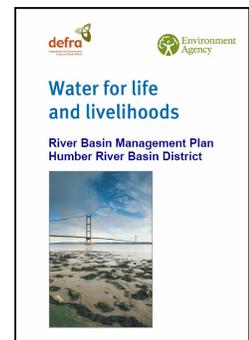
Thus potential effects on implementation of the relevant plan need to be taken into account in determination of applications. The Environment Agency can provide advice on this and the River Basin Management Plans are all available on their website (see www.environment-agency.gov.uk/wfd).

Why is there a need for this Planning Guide?

There were two principal drivers for developing this Guide:

1. **Understanding and managing impacts** - Interest in small-scale hydropower schemes has increased over recent years. However, hydropower development can give rise to a wide range of socio-economic and environmental impacts ranging from flood risk to fisheries, landscape to navigation.

Hydropower developments will inevitably affect the river environment and thus may assist or impede achievement of Water Framework Directive objectives in River Basin Management Plans (see



Appendix B). In some locations hydropower development may affect habitats and species protected by legislation under the Habitats Directive (see **Appendix C**). While there is a need to support the installation of new schemes to help achieve national renewable energy targets, it is therefore necessary to ensure that these often interdependent impacts are effectively managed through the planning process, to ensure that schemes do not compromise compliance with either Directive and, where possible, that they contribute positively towards achievement of Water Framework Directive targets.

2. **Creating a more joined-up approach to permitting** - Planning permission is not the only consent that needs to be obtained before the development of a small-scale hydropower scheme can proceed - a number of Environment Agency permits are also likely to be required. Many of the issues important to the determination of both planning and Environment Agency applications are similar and there is also an established requirement for local planning authorities to consult the Environment Agency on planning applications for hydropower schemes. Consequently, there is a need for a high degree of co-operation between both regulators to ensure that duplication is avoided, a consistent approach to determining applications is adopted and that decisions are well-informed.

What is the scope and purpose of this Guide?

This Guide has been developed to:

- improve the skills and confidence of local authority planners in managing hydropower planning issues and balancing socio-economic and environmental impacts;
- inform developers of the potential socio-economic and environmental effects that could arise from hydropower development so that they can be considered early in the siting and design of proposals;
- encourage greater co-operation between local authority planners, Environment Agency staff, developers and other stakeholders in planning for hydropower;
- clarify information requirements and reduce the potential overlap between planning and other permitting processes; and
- raise awareness of the Water Framework Directive, fisheries and flood risk and its relevance to planning decisions on hydropower schemes.

Whilst the guide references the whole of the former East Midlands Regional Government Area it is intended to be transferable and relevant to hydropower schemes on non-tidal rivers across England.

Relationship with other guidance

This guidance should be read in conjunction with existing national planning policy guidance on renewable energy as well as other issues that may be relevant to hydropower applications (e.g. flood risk, nature conservation and biodiversity). There may also be local planning policies and other non-planning strategies that should be considered in the design and determination of hydropower proposals. These may include, for example, River Basin Management Plans.

This guide is also intended to complement the *Environment Agency's Good Practice Guidance for small-scale and micro-scale hydropower*, due to be published early in 2012, which provides advice and technical guidance for

designers and developers of hydropower schemes in the context of the permits and consents required by the Environment Agency, and *Hydropower: A Guide for You and Your Community*, which provides advice on the issues associated with developing hydropower schemes in England and Wales.

A list of useful sources of further information is provided in **Chapter 6** of this Guide.

Structure of this Guide

Chapter 2: Provides an overview of the consenting process (both in terms of planning and Environment Agency permitting). It describes the information that is likely to be required in support of applications and identifies who should be consulted during the application process.

Chapter 3: Introduces and provides examples of different types of hydropower schemes using case studies where appropriate.

Chapter 4: Highlights the key planning issues associated with hydropower schemes and provides recommendations as to which regulator (i.e. the local planning authority or Environment Agency) should take the lead on specific issues in order to avoid duplication.

Chapter 5: Draws together and summarises the key messages from chapters 4 and 5 by providing a list of measures that can help to ensure a successful application.

Chapter 6: Provides a signpost to other relevant sources of information and guidance.

Tell us what you think

It is important that this Guide meets your needs and we would welcome your views on how it could be improved. We have included specific consultation questions at the end of each chapter to help prompt responses but we are happy to receive comments on any aspect of the Guide.

Comments on the guide should be sent to: Alex Melling, preferably by email to alex.melling@amec.com or by post to Alex Melling, AMEC, 155 Aztec West, Park Avenue, Almondsbury, Bristol, BS32 4UB. Tel. 01454 822019

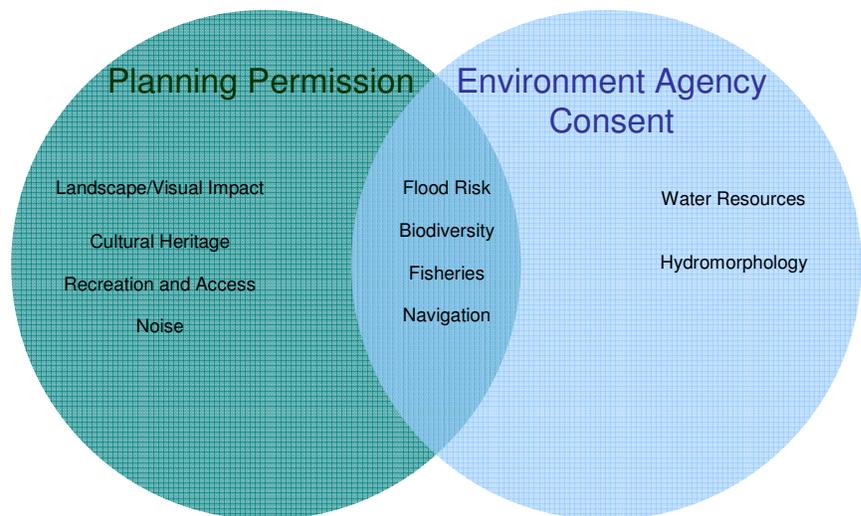
Comments should be received by: 13th January 2011

2. Hydropower and the Consenting Process

This chapter describes the planning process and highlights the Environment Agency consents that may also be required before development of a hydropower scheme can proceed. The chapter also identifies supporting information that is likely to be required to be submitted alongside an application and provides guidance relating to who should be consulted on hydropower proposals.

What consents are needed for hydropower development?

There are two principal types of consent that will be required for hydropower development - planning permission and Environment Agency permits. Planning permission establishes whether a hydropower scheme is an acceptable use of land (which includes the riverbed), taking into account socio-economic and environmental considerations. Environment Agency permits control the design (e.g. fish pass design) and operation (e.g. the amount of water) of a hydropower scheme to ensure environmental protection.



Whilst each type of consent has a different emphasis, there are a number of overlaps in terms of the issues that need to be considered in the determination of applications.

Consequently, developers should be encouraged to apply for planning permission and Environment Agency permits at the same time (this is known as 'parallel tracking'). This will enable applications to be dealt with more efficiently and consistently by reducing overlap in the consideration of important environmental issues.

Each type of consent is discussed in more detail below.

When is planning permission required?

The Town and Country Planning Act 1990 states that planning permission is required to carry out 'development'. Development is defined by Section 55 of the Town and Country Planning Act 1990 as: '*... the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any building or other land.*'

Hydropower schemes do not benefit from permitted development rights⁶ and planning permission will therefore be required from the relevant local planning authority including for installation of the turbine itself, any associated buildings and for any works required to facilitate the scheme (such as a new channel or pipeline).

⁶ As set out in The Town and Country Planning (General Permitted Development) Order 1995 (as amended).

Hydropower scheme components

The main elements of hydropower schemes that are likely to be of particular importance in the determination of planning applications are:

Intake

The intake typically comprises a weir or dam across the watercourse. A spillway ensures that the downstream watercourse is never totally deprived of flow, and a screen or trashrack prevents floating debris or fish from entering the pipeline. A valve or sluiceway is often incorporated, and where the watercourse has a high silt load, a settling tank may be required. The Environment Agency should be consulted regarding disposal of debris from the trashrack. Current regulations may require that debris is disposed of off site, but the Environment Agency may grant an exemption under some circumstances.

Pipeline or headrace

The pipeline (sometimes called the penstock) connects the intake with the turbine. High head schemes typically have smaller diameter pipes of longer length (sometimes over a kilometre), whereas low head schemes are typified by short, larger diameter pipes. Pipes are often buried for environmental or technical reasons. Anchor blocks to restrain the pipe are required at vertical and horizontal changes of direction, but these are usually buried if the pipe is buried.

Open headrace channels are now rare on new schemes, but may occur if the project involves the rehabilitation of an existing scheme, particularly on old watermill sites.

For a turbine placed directly in a weir or dam, there will usually be no headrace.

Turbine house

The building houses the turbine, generator and ancillary equipment, and is typically a single storey building of between 3 metres by 4 metres for a small domestic scheme, to 10 metres by 10 metres for a large grid connected scheme. Occasionally, particularly on old watermill sites, the machinery may be located in an existing building. Vehicular access to the turbine house is required for construction and maintenance purposes.

To minimise the length of the tailrace, and to maximise the available head, the turbine house is usually located close to the watercourse.

Tailrace

After use, the water is returned to the natural watercourse. To avoid flooding the turbine, this channel should have a gradient sufficient to allow free discharge of water. A screen to prevent the ingress of fish is often incorporated, and occasionally the tailrace is an underground structure.

Grid connection or cabling to end user

The connection between the turbine house and the local electricity network is typically wires, supported on single wooden poles.

What is the Environment Agency's role in the determination of planning applications?

Local planning authorities have a statutory obligation⁷ to consult the Environment Agency on hydropower planning applications and the Environment Agency is also a statutory consultee on Environmental Impact Assessments (where these are required). It is also recommended that discussions are held between the local planning authority and the Environment Agency at the pre-application stage. These discussions could usefully establish:

- the suitability of the proposed site for hydropower in the context of the catchment as a whole;
- likely information required to support an application including the scope of the Environmental Statement (if required) or supporting environmental information;
- potential issues (material planning considerations) and agreement as to which regulator will take the lead on specific issues (this is discussed in more detail in **Chapter 4** of this Guide);
- the likely potential significant environmental effects; and
- design elements that might be required (e.g. fish passes and screens) and the potential planning impacts of these (e.g. visual appearance).

What Environment Agency permits/consents are likely to be required?

Permits and consents likely to be required from the Environment Agency before development of a hydropower scheme can proceed include:

- **Water abstraction licence:** The Water Act 2003 amended the Water Resources Act 1991 to provide for three types of abstraction licences; Transfer, Temporary, Full Licences. All abstraction licences must be Time Limited – this will normally be 12 years, but will be to the Common End Date for the catchment, as set out in Catchment Abstraction Management (CAMS)⁸ documents.
 - Transfer Licence - where water is transferred from one 'source of supply' to another without intervening use. Hydropower schemes will normally be permitted using a Transfer Licence to authorise the removal of water from the main watercourse through a 'leat' or similar and returning the water to the main watercourse. There is no annual abstraction charge on a transfer licence.
 - Temporary Licence – authorises abstraction for a maximum of 28 days. Not applicable to hydropower.
 - Full Licence – authorises abstraction for a 'use' and is chargeable under the Environment Agency abstraction charging scheme. There is still an exemption from charges for hydropower under 5MW, but Full Licences will not normally be used for hydropower schemes. Full licences will not be

⁷ Schedule 5 to The Town and Country Planning (Development Management Procedure) (England) Order 2010 (SI 2010 No. 2184) stipulates that local planning authorities should consult the Environment Agency on planning applications in Flood Zone 2 and Flood Zone 3 and for development involving the carrying out of works or operations in the bed of, or within 20 metres of the top of a bank of, a main river or the culverting or control of flow of any river or stream.

⁸ CAMS - Catchment Abstraction Management Strategies are six-year plans detailing how the Environment Agency plans to manage water resources in each river catchment. These are available at www.environment-agency.gov.uk/CAMS

granted on hydropower schemes without the applicant agreeing to a derogation condition that enables the Environment Agency to grant abstraction licences upstream of the hydropower site in accordance with its CAMS policy.

Note that abstraction licenses are not required for hydropower schemes situated within weirs.

- **Water impoundment licence:** applies if changes are being made to structures which impound water, such as weirs and sluices, or if new structures are to be built.
- **Flood defence/land drainage byelaw consent:** this is required for:
 - any works being carried out within, over or under the channel of a statutory ‘main river’, including its banks, including alteration of existing structures (Section 109 Water Resources Act 1991);
 - erection of culverts or flow control structures within any watercourse, or alterations to these that will affect flow, where this is not in an Internal Drainage Board operating area (Section 23 Land Drainage Act 1991);
 - erection of structures including buildings, walls and fences etc, within the ‘byelaw margin’ of a main river (Environment Agency Regional Land Drainage / Flood Defence Byelaws). This margin is specified in byelaws, which vary around the country. Developers should consult the local Environment Agency office over proposals for any structures within 20m of a main river, to ensure this requirement is assessed, though consent will not be required for every case
- **Fish pass and fish screen approval:** approval is required for fish pass design and operating requirements where a fish pass is required or altered for the scheme proposed and for fish screening arrangements. The requirements for fish passes and fish screens will normally be imposed as conditions on an abstraction or impoundment licence, whichever is relevant.

The Environment Agency may also require a **Section 158 Agreement** to be drawn up, which defines certain further details on the way the scheme must be operated in order not to conflict with the Environment Agency’s river management duties, e.g. rights of access, the control of river levels, maintenance of the weir and river structures, fisheries and other environmental protection duties, etc.

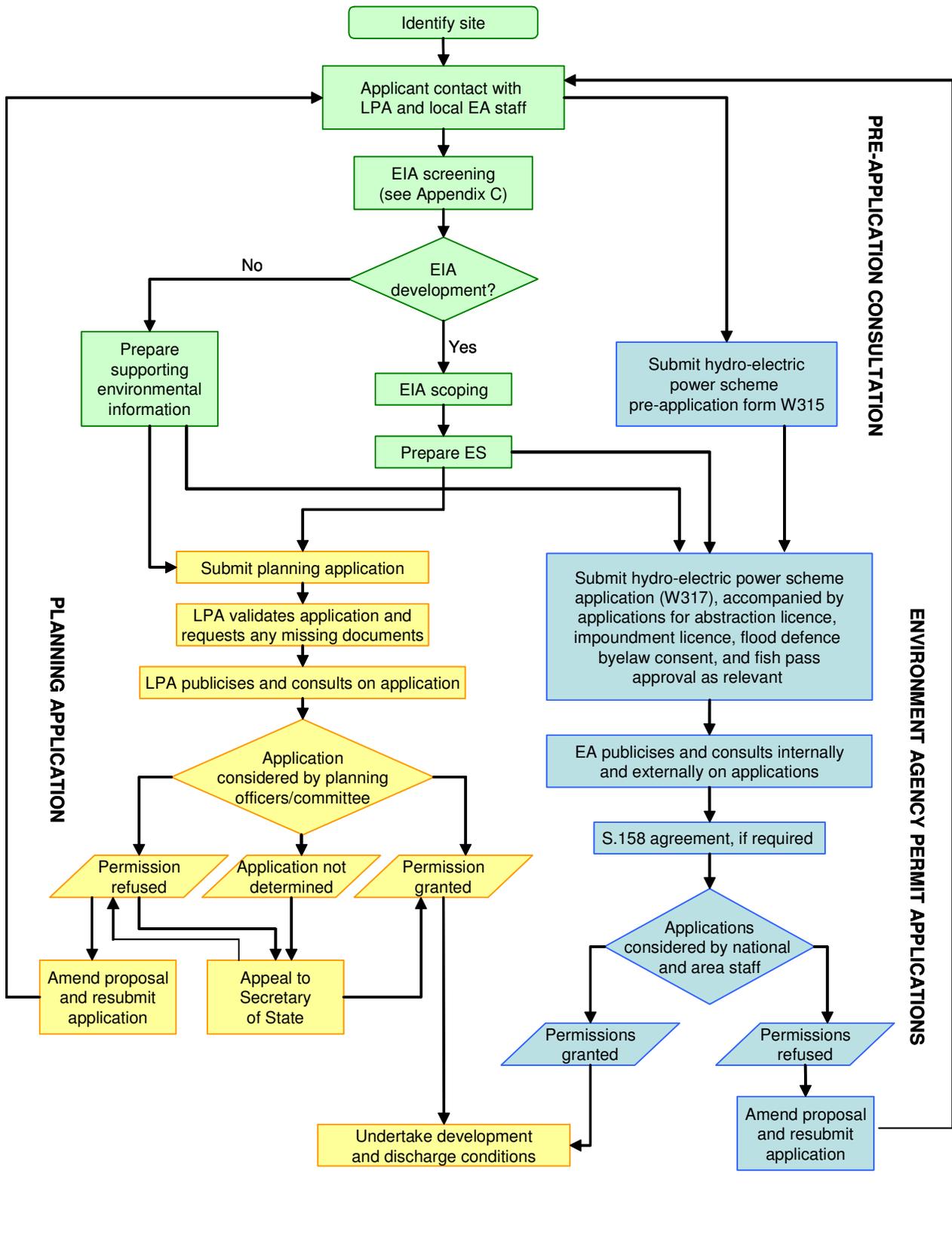
The Environment Agency provides a [pre-application form](#) for hydropower schemes, which initiates pre-application consultation, and an overall [hydropower application form](#), which is submitted as part of a single application pack including application forms for all the above permissions.

What is the planning and permitting application process?

Figure 2 shows the typical planning application and Environment Agency permitting processes.

Consents other than planning permission that may be required, including Environment Agency permits, are summarised in the box following the flow chart.

Figure 2 Summary of the planning application and Environment Agency permitting processes for hydropower schemes



Other development consents and permissions

Other permissions besides planning permission may also be required from hydropower schemes depending on the nature of the scheme and where it is located and applicants will need to ensure that they have met the requirements of the relevant authority. Other permissions include, but are not limited to:

Environment Agency permits such as:

- **Abstraction licence:** where water is to be removed from the river channel
- **Impoundment licence:** where the watercourse is to be impounded or impounding structures are to be altered
- **Consent for Works Affecting Watercourses:** the erection of culverts, flow control structures or alterations to these may require consent from the relevant Internal Drainage Board under the Land Drainage Act 1991
- **Approval for fish passes and fish screens:** through conditions on abstraction or impoundment licences

Local Planning Authority permissions such as:

- **Listed Building Consent:** often hydropower schemes will involve the reuse of buildings which are listed. Any development which affects Listed Buildings will require Listed Building consent under the Planning (Listed Buildings and Conservation Areas) Act 1990 from the relevant local planning authority.
- **Conservation Area Consent:** Conservation Area Consent under the Planning (Listed Buildings and Conservation Areas) Act 1990 is administered by the relevant local planning authority and is required for the total or substantial demolition of any unlisted building within a Conservation Area.

Protected Species Licences: Licences may be required from Natural England for any works affecting statutorily protected species

Marine Licence: A Marine Licence is required under the Marine and Coastal Access Act 2009 from the Marine Management Organisation for any activities involving a deposit or removal of a substance or object below the mean high water springs mark or in any tidal river to the extent of the tidal influence (this may affect schemes on the lowest weir on navigable rivers, such as at Cromwell on the River Trent).

Electricity Development Consents: The Department of Energy and Climate Change administers the Electricity Act 1989 for developers seeking Section 36 and Section 37 consents to build and operate electricity generating stations of over 50 MW (onshore) and for overhead lines.

Local Electricity Network Operator Agreement: Agreement will be required for the local network operator if the scheme is to be connected to the electricity distribution network.

Microgeneration Certification: Certification under the Microgeneration Certification Scheme is required if the hydropower scheme is to be eligible for payment of Feed-in Tariffs (FITs)

What information and supporting documents should be submitted with a hydropower application?

Documentation required in support of a planning application for a hydropower scheme will include plans and a Design and Access Statement, similar to other applications. However, a range of other supporting information/documentation is also likely to be necessary and in a number of instances similar environmental information is likely to be required for the Environment Agency permitting processes. This information may include details relating to hydrology, fisheries, ecology, landscape and visual impact, navigation and cultural heritage. Development on or adjacent to a river may have an impact on flood risk and applications for hydropower schemes will therefore usually need to be accompanied by a Flood Risk Assessment. Further guidance on Flood Risk Assessments is contained within Planning Policy Statement 25: Development and Flood Risk. Where there is potential for a hydropower proposal to have a significant effect on European designated sites, the developer may be required to provide additional information to support a Habitats Regulations Assessment. Further information on this process is provided at **Appendix C**.

In some cases the developer may be required to undertake an Environmental Impact Assessment (EIA) and submit, with the planning application, an Environmental Statement. **Appendix D** provides more detail relating to when the preparation of an Environmental Statement may be required. Developers should be encouraged to commence the scoping process as early as possible.

For schemes that are the subject of EIA, it may assist both the local planning authority and the Environment Agency if environmental information to support applications both for planning permission and for permits issued by the Environment Agency is included in a single Environmental Statement, with detailed technical information in appendices, to ensure that both regulators have access to all relevant information. Similarly, if EIA is not required, it may be useful to combine environmental information into a single environmental report. The requirements for environmental information and the way it is to be presented should be agreed between the local planning authority, the Environment Agency and the developer at the pre-application stage.

A more detailed checklist of documents/information that may be required as part of both planning and Environment Agency permitting processes is provided at **Appendix E**. This is intended to provide a useful reference point for local planning authority officers, Environment Agency staff and developers. The checklist is not an exhaustive list of all documents that may be required and this will vary depending on specific site and scheme details. It is recommended that developers contact the relevant local planning authority and the Environment Agency at an early stage to discuss information requirements.

Who should be consulted on hydropower schemes and when?

Developers should be encouraged to undertake early and continuous consultation. In the first instance, developers should undertake pre-application discussions with both the relevant local planning authority and the Environment Agency. This will help:

- remove, as far as possible, uncertainties as to whether a scheme is likely to be approved or rejected;
- avoids costs and delays associated with failed applications or redesign works;
- ensure that all supporting information requirements are identified; and
- provide an opportunity to resolve conflicts and improve the quality of the development.

In advance of pre-application discussions, developers should complete the *Planning Site Audit Checklist* contained at **Appendix G** of this Guide alongside the *Environment Agency Environmental Site Audit Checklist* and *Pre-application form*.

Environment Agency Hydroelectric-Power Scheme Pre-Application Form

The Environment Agency's Hydroelectric-Power Scheme Pre-Application Form (Form WR315) is designed to help developers provide the Environment Agency with information needed to support a formal application. It comprises two parts:

-Part A requests contact detail and basic site information including, for example, site name, location details and a description of the proposal.

-Part B requests technical information (if available at the pre-application stage) including in relation to water resources, fisheries and flood risk.

The Form should be completed by the developer and submitted to the Environment Agency as early as possible. Following receipt of the form an account manager is allocated and a pre-application response provided.

Further information is available from the Environment Agency's website.

Hydropower schemes can impact upon local communities, river users and the environment and developers should therefore undertake pre-application consultation with other stakeholders. This will help identify and resolve issues prior to the formal planning application process and may also encourage buy-in. Those consultees that could usefully be consulted on hydropower proposals (in England) at the pre-application stage include:

- environmental bodies such as the Environment Agency, Natural England, Wildlife Trusts, the RSPB and Area of Outstanding Natural Beauty Management Units (where applicable);
- rivers users including representative bodies such as the Ramblers Association, British Waterways, Inland Waterways Association, Angling Trust, National Association of Boat Owners and the Rivers Trusts;
- non-planning local authority officers with remits including environmental health, highways, ecology and archaeology;
- neighbouring uses including residents and businesses;
- those with an interest in the built environment including English Heritage;
- the regional electricity company; and
- neighbouring local planning authorities.

This list is not exhaustive and the range and type of consultees will vary depending on specific site and scheme details. Developers should also refer to the relevant local planning authority's Statement of Community Involvement which will include details on consultation arrangements for planning applications.

Key Messages

Developers should:

- undertake pre-application discussions with the relevant local planning authority and the Environment Agency
- complete environment and planning site audit checklists
- apply for planning permission and Environment Agency permits concurrently

Local planning authorities and the Environment Agency should:

- encourage developers to undertake pre-application consultation
- direct developers to existing guidance including the Environment Agency's *Good practice guidance for small- and micro-scale hydropower*, pre-application form and environment and planning site audit checklists
- encourage developers to parallel track applications
- encourage developers to prepare Environmental Reports (or Environmental Statements where required) covering all environmental issues relevant to both planning and permitting processes

Tell us what you think

- **Have we identified the most important planning supporting information/documents?**
 - **Would it be useful to have a standard planning pre-application form, analogous to the pre-application form used by the Environment Agency?**
 - **Are there any other consultees that should be listed in the Guide? If so, who are they?**
 - **Are there any additional key messages that you think need to be highlighted in this Guide?**
-

3. Types of hydropower installation

Hydro-electric power installations vary greatly in their layout and design and thus in their potential environmental effects. In upland areas, there may be a significant 'head' available (the difference between the water levels at the intake and the outlet), while in lowland areas the head (e.g. across a weir in a river) is often small but large volumes of water may be available. While hydropower schemes are non-consumptive, some installations involve return of the water some distance downstream of the abstraction point, leaving a river reach with reduced flow, referred to as a 'depleted reach'. The reduction in flow may be of concern in relation to river ecology and fishery interests. As the planning considerations can differ significantly between these different types of scheme, it is convenient to identify a number of different scenarios, separating 'high head' and 'low head' schemes and those with and without depleted reaches.

There are schemes representing four of these scenarios in place in the East Midlands (and the wider UK), with a potential fifth for which there are, as yet, no find UK examples:

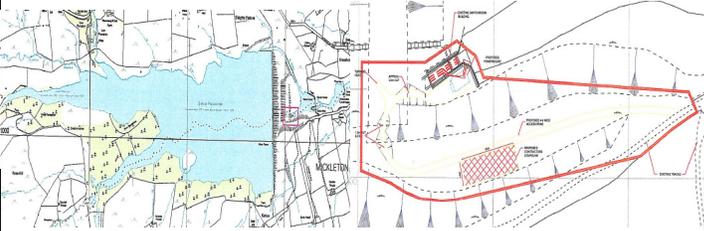
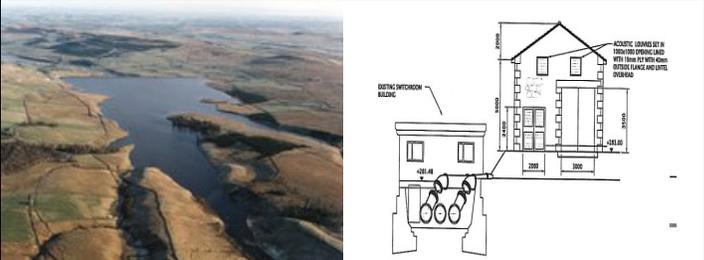
1. high head scheme - turbine in or adjacent to reservoir dam, no depleted reach;
2. high head scheme - turbine supplied by diverted flow (typically via a pipeline), with a depleted reach.
3. low head scheme - turbine on or adjacent to weir, no depleted reach
4. low head scheme - turbine on mill leat or other diverted flow, with a depleted reach;
5. 'stream wheel' type scheme - no barrier, relying entirely on kinetic energy of the river flow – may be more relevant in tidal flows.

Annex F provides more detail on these scenarios and highlights where planning issues are likely to differ between them.

In the rest of this section, case studies are presented with examples to cover each main scenario.

More case studies may be added to illustrate additional points – see consultation question at the end of this section.

Selset Reservoir, River Lune (Scenario 1)

Local location map		<p>Development description</p> <p>Developer: RWE Npower Partner: Northumbrian Water Catchment: River Lune LPAs: Teesdale District Council (now part of Durham County Council) Status: Planning Permission granted 2007. Operational 2011 Type: High Head - scenario 1 Turbines: 1 Francis turbine Rated electrical output: 750kW_e</p>
Location of scheme on England map		

Planning application details and key issues

- Planning application submitted to Teesdale District Council (TDC) (abolished in 2009, now part of Durham County Council) in February 2007 and was approved in September 2007. Work commenced on the scheme in spring 2010 and it has been fully operational from the summer of 2011.
- Pre application discussions were held by the developer with TDC, Natural England, Northumbrian Water, Durham Wildlife Trust and the Game Conservancy Trust (black grouse officer).
- Landscape and visual impacts were a key issue – the site lies within the North Pennines AONB – and sensitive design was required. The powerhouse (the only above ground element) was constructed in a vernacular style (sandstone walls and slate roof), as agreed with TDC, to minimize adverse effects.
- Natural England raised concerns over impacts on protected species. Presence of otters was identified and to avoid harm, trenches/excavations were covered overnight. For operation, no issues were raised;
- Noise was raised as an issue and a survey undertaken. The nearest noise receptors were at least 460m away and the turbine operating equipment were enclosed within a building which limited the increase on noise to only 10-18dB(A) at the nearest receptors.

Key issues/ lessons learnt

- In areas identified as being of landscape importance, the incorporation of sensitive design principles when constructing any above ground structures will help ensure the scheme fits seamlessly within its surrounding local environment and will mitigate concerns about landscape and visual impacts. This will apply to many upland reservoir-based hydropower schemes
- In remote upland areas the effects of the construction phase of the development, including access to the site by plant, may be of most concern and should be considered as part of application process.

Glenridding Beck, Ullswater (Scenario 2)

Local location map		<p>Development description</p> <p>Developer: Northern Hydro (originally) now owned and operated by United Utilities</p> <p>Catchment: Ullswater (R. Eamont)</p> <p>LPA: Lake District National Park</p> <p>Status: Planning permission granted 1990 (HEP installation Rattlebeck Bridge) and 2011 (improvements to intake)</p> <p>Type: High head - scenario 2 (130m head, 1700m pipeline)</p> <p>Turbines: 1 Gilkes Turgo</p> <p>Rated electrical output: 500kW_e</p>
Location of scheme on England map		

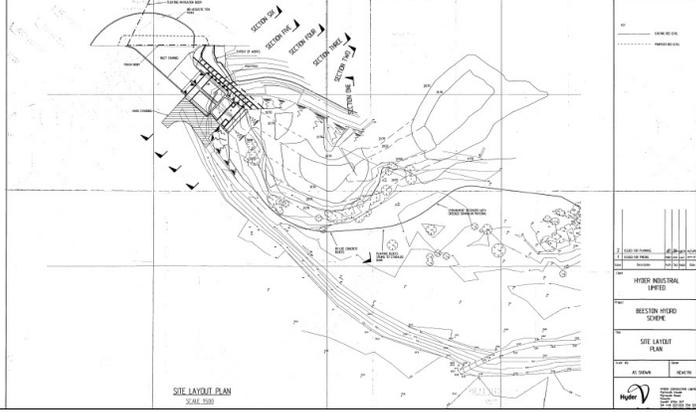
Planning application details and key issues

- Planning permission (7/1990/3019) for the HEP installation at Rattlebeck Bridge, using an existing intake weir and turbine house, was granted in 1990 subject to conditions. The National Rivers Authority also issued an abstraction licence. Further planning permission and scheduled monument consent for improvement of the intake structure performance (7/2011/3039) was granted in 2011.
- The site is located in a sensitive location (in the Lake District National Park) and the dam is close to Greenside Lead Mine (a scheduled monument) and the Lake District High Fells SAC and SSSI. Consultation was held with English Nature (now Natural England) and English Heritage at the outset.
- To help minimise adverse landscape and visual effects, Northern Hydro faced the dam with local stone, buried the pipeline and replaced the corrugated steel roof of the turbine house with local slates.
- To mitigate problems of clogging of the abstraction point with stones, sediment and vegetation, alterations were made in 2011 involving installation of a Tyrolean screen to prevent blockages.
- Due to the issues of sensitive ecology and mine archaeology and the need for excavation of contaminated land and gravel, a method statement was drawn up in agreement with Natural England, Environment Agency and Eden DC at pre-application stage. A temporary water supply to the local Youth Hostel, which uses the watercourse, was provided while construction works took place.

Key issues/ lessons learnt

- As such schemes involve a flow-depleted reach in a watercourse, it is imperative that pre-application discussions are held with Environment Agency, as they are best placed to consider this issue).
- Method Statements should be included with applications if significant engineering works are involved and should include details of extraction or movement of river sediments and gravels if required.
- Where periodic management of the intake is required (in this case to address build up of sediment and stones), monitoring conditions should be included with permissions to ensure that delivery is effective.
- Pre-application surveys are likely to be required if the site is located in an environmentally sensitive area (re ecology, flood risk or cultural heritage) or involves contaminated land.

Beeston Weir, River Trent (Scenario 3)

Local location map		<p>Development description</p> <p>Developer: Norweb Hydro Power Ltd/Hyder Industrial Ltd (now operated by Novera Energy)</p> <p>Catchment: River Trent</p> <p>LPA: Nottingham City</p> <p>Status: Planning permission granted 1995. Operational 2000.</p> <p>Type: Low head - scenario 3</p> <p>Turbines: Kaplan (2No.)</p> <p>Installed capacity: 1,600kW</p>
Location of scheme on England map		

Planning application details and key issues

- Planning application to Nottingham City Council (NCC) (95/00831/PFUL3). Permission granted - 6 months from receipt of application to determination.
- 250+ objections received primarily from local residents- mainly on construction traffic, visual intrusion in the Green Belt, impacts on habitat and fishing, flood risk and noise. The Green Belt issue was significant but NCC resolved that the generation of renewable energy constituted an exceptional circumstance to warrant development in the Green Belt. The size and design of the building housing the plant was revised to reduce visual impacts by placing most equipment below weir crest level.
- Barges were used for excavated material to mitigate adverse impacts of construction traffic.
- Fishery mitigation included a fish pass and re-creation of gravel-shoal habitat and a nursery pool.
- Further environmental enhancements were included as planning conditions, including:
 - redesign to reduce the size of the scheme and the volume of excavated material to be moved;
 - fish screening/bubble curtain and improved fish pass for both salmonid and coarse fish; and
 - tail race design to recreate a suitable hydraulic regime for gravel shoal habitat re-creation.
- Since the scheme has been operational there have been issues relating to fluctuations in flow (in some cases leading to boats running aground) and a reduction in coarse fish breeding success.

Key issues/ lessons learnt

- Establish links with EA Area Account Manager/Planning Liaison Officer at outset to establish permits required and likely main issues (e.g. flooding, visual impact, fish, ecology, water resources).
- Carefully consider landscape/visual impact, especially in designated areas (e.g. AONB) and the Green Belt, and adopt appropriate mitigation measures/design changes to minimise adverse effects.
- Where appropriate, consult local communities early to identify concerns and design mitigation.
- Consider impacts of construction traffic on local roads/residents. Use barge transport where possible.
- Agree whether water related aspects are better addressed through EA permits than through the planning process.
- Actively involve the EA in the design of measures to mitigate adverse impacts upon or to enhance biodiversity, including fisheries.

Alport Mill, River Lathkill (Scenario 4)

Local location map		<p>Development description</p> <p>Developer: Derwent Hydro Partner: Haddon Estate Catchment: River Lathkill (Derwent) LPAs: Peak District National Park Status: Planning permission and listed building consent granted. Type: Low head - scenario 4 Turbines: 1 cross-flow turbine Rated electrical output: 30kW_e</p>
Location of scheme on England map		

Planning application details and key issues

- Two linked applications were submitted to Peak District National Park Authority for installation of the hydropower scheme (NP/DDD/0608/0518) and alterations to retaining walls in the curtilage of a Listed Building (NP/DDD/0708/0559). No objections were registered and they were approved (4-5 months approximately to determine). The relevant planning consents were issued in October 2008 and the scheme was implemented successfully in spring/summer 2009 and is now operational.
- The main planning considerations involved potential impacts on features of ecological interest (mainly fish, aquatic plants, insects, birds and local habitats) and impacts on the setting of the old mill Grade II listed building, on the Alport Conservation Area and features of archaeological interest.
- Mitigation measures to safeguard local species of interest were agreed and implemented.
- An archaeological desk study was prepared to accompany on-site surveys undertaken.
- The Environment Agency required a transfer licence to allow water to be temporarily removed from a water source and land drainage byelaw consent for permission to carry out works within 8m of a 'main river' channel. The transfer license application was submitted in February 2008 and approved in June 2008. The land drainage consent was subsequently submitted and approved.
- The effect on fisheries was the main issue raised by the Environment Agency. To help mitigate adverse effects, the turbine intake and tailrace tunnel outlet were fitted with a fine-meshed screen and a bar screen (with 50mm spacing) respectively to prevent fish from being harmed.

Key issues/ lessons learnt

- Principal concerns were potential impacts on aquatic ecology and cultural heritage (Grade II Listed building, Alport Conservation Area and an area of archaeological interest). Pre application discussions with the local authority ecologists and historic environment teams and early consultation with Natural England, English Heritage and the Environment Agency ensured potential impacts were flagged at an early stage and could be addressed efficiently.
- Note that this scheme pre-dates publication of the Environment Agency's Good Practice Guidelines, although many of the procedures adopted are now incorporated into the guidelines.

Tell us what you think

- **Do you have information for any other case studies that would illustrate additional points?**
-

4. Key Planning Issues

This chapter identifies the key planning issues associated with hydropower schemes and suggests the body (i.e. the local planning authority or Environment Agency) that should take the lead in each case. The issues identified are based on consultation with local planning authority officers, Environment Agency staff and other stakeholders as well as national planning policy and case studies. The chapter also introduces planning site audit checklists that are designed to support the planning application process.

What are the key planning issues and how can they be resolved?

All planning applications for hydropower schemes must be determined in accordance with the policies of the development plan (i.e. Local Development Documents prepared by local planning authorities)⁹. The development plan will be available on local planning authority websites.

National planning policy (a summary of national planning policy that is likely to be relevant to hydropower schemes is provided at **Appendix A**) as well as other planning policy documents prepared by local planning authorities such as Supplementary Planning Documents may also be ‘material’ to the consideration of a planning application.

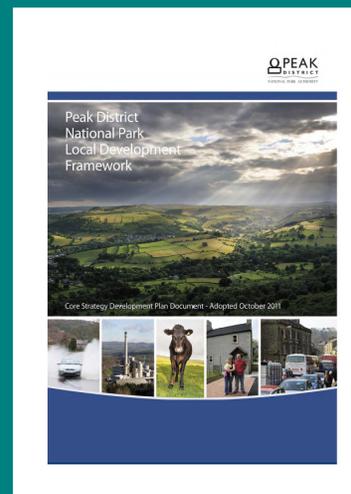
Peak District National Park Core Strategy – An Example of Renewable Energy Development Plan Policy

The Peak District National Park Local Development Framework Core Strategy was adopted in October 2011. It forms part of the Development Plan for the National Park and sets out desired spatial outcomes to 2026.

Policy CC2 of the Core Strategy specifically concerns local carbon and renewable development. It stipulates that:

- Proposals for low carbon and renewable energy development will be encouraged provided they can be accommodated without adversely affecting landscape character, cultural heritage assets, other valued characteristics, or other established uses of the area;
- Cumulative impacts of low carbon and renewable energy development within the National Park and visible beyond its boundary must be taken into account;
- Where proposals do not compromise the valued characteristics of the National Park the Authority will also take into account the economic, social and wider environmental benefits of renewable and low carbon development.

The plan highlights that hydropower generation can be well suited to the Peak District landscape provided it does not deplete river flows and points to a [study](#) published by Friends of the Peak District¹⁰ which identifies potential sites for micro hydropower.



⁹ See Section 38(6) of the Planning and Compulsory Purchase Act 2004

¹⁰ Friends of the Peak District (2010) Peak Power: developing micro-hydro power in the Peak District. 86pp.

Any other issues that relate to the use and development of land are capable of being a material planning consideration.

Key planning issues that may be associated with hydropower schemes are listed and described in the table below. For each issue the table identifies:

- **mitigation measures:** these comprise actions (e.g. pre-application consultation), potential design and locational considerations and operational restrictions that may need to be considered by developers to help resolve/address issues where they arise;
 - **whether the local planning authority or Environment Agency (in their role as statutory consultee) should take the lead:** many of the identified issues are also important considerations in the determination of other consents issued by the Environment Agency (e.g. flood risk) and it is therefore important that the duplication of effort is minimised. This can be achieved by assigning technical areas to among local planning authority officers and Environment Agency staff;
 - **planning conditions:** these conditions could be attached to permissions for hydropower schemes to help enhance the quality of the development and also mitigate adverse effects.
-

Key Planning Issue	Lead		Description	How the issue can be resolved	Potential planning conditions
	LPA	EA			
Landscape/Visual	✓		<p>Turbines and associated buildings can have an adverse visual impact, particularly as they are located on rivers which are often popular amenity locations. The visual appearance of reduced water in waterfalls can also be an issue associated with the operation of hydropower schemes.</p> <p>Hydropower schemes may affect local or wider landscape character and are often located in the open countryside and locations that are of high landscape value/sensitivity (e.g. National Parks and Areas of Outstanding Natural Beauty).</p>	<ul style="list-style-type: none"> Consider locations where hydropower development may be more in-keeping with surrounding landscape character and uses (e.g. on farms). Locate schemes or elements thereof (e.g. turbine houses) away from main focal points. Consider reduced operation during low flows (e.g. during summer months). Where possible, integrate schemes into the landscape for example, by using existing woodland cover and new planting. Reduce the scale of built elements or adopt design which is in-keeping with local landscape and architectural features including by using materials traditional to the area. Consider burying of pipelines and undergrounding the grid connection. Explore the potential to use existing buildings to house machinery. 	<ul style="list-style-type: none"> Plans of turbine house and contractors compound to be agreed. Building design and materials to be approved. Time limits to be set on use of contractors compound. Time limits to be set on hours of working. Pipeline route and restoration procedures to be agreed and approved on site.
Cultural Heritage	✓		<p>Hydropower schemes will often be located adjacent to, or will utilise, old mills and weirs. These sites often contain Listed Buildings or other heritage assets and therefore there is potential for proposals to either directly affect such assets (e.g. through alteration or demolition) or impact on their setting.</p> <p>Hydropower schemes also involve excavation (e.g. for the laying of cables) and consequently there is the potential for works to affect archaeological remains.</p>	<ul style="list-style-type: none"> Design hydropower schemes to ensure that they complement the existing built environment including by using materials traditional to the area. Undertake early consultation with English Heritage and the relevant local planning authority to identify any potential cultural heritage issues. 	<ul style="list-style-type: none"> Plans of turbine house and contractors compound to be agreed. Building design to be approved. Pipeline route and restoration procedures to be agreed and approved on site.

Key Planning Issue	Lead		Description	How the issue can be resolved	Potential planning conditions
	LPA	EA			
Water resources and hydromorphology		✓	<p>Hydropower schemes do not normally consume water but return it to the channel from which it was abstracted. However, flow depletion may need to be considered if there is a depleted reach (i.e. the section between the intake and tailrace), where reduced flow may reduce habitat diversity and cause siltation, which can significantly impact river ecology and visual appearance.</p> <p>Alteration of flow patterns below weirs may lead to localised changes in bank erosion.</p>	<ul style="list-style-type: none"> Consider ecological impacts of the depleted reach. Fully consider the relevant CAMS at the site identification stage. Fully consider the potential impact of the scheme on the status of the water body and relevant Water Framework Directive targets. Design the intake/outfall to minimise erosion. 	<ul style="list-style-type: none"> Prevention of pollution procedures to be agreed. Environmental Liaison Officer procedures to be agreed (on very sensitive sites). Monitoring requirements to be agreed and carried out (on very sensitive sites). Work to be carried out in accordance with agreed method statement.
Flood risk		✓	<p>There is potential for hydropower schemes to increase flood risk as a result of a reduction in a river's flood flow capacity or due to impoundment failure. Construction activities may also result in increased flood risk (e.g. as a result of increased surface water runoff).</p>	<ul style="list-style-type: none"> Planning applications should be accompanied by a Flood Risk Assessment. Flood defence consent from the Environment Agency is likely to be required. 	<ul style="list-style-type: none"> Work to be carried out in accordance with agreed method statement.

Key Planning Issue	Lead		Description	How the issue can be resolved	Potential planning conditions
	LPA	EA			
Ecology/biodiversity	✓	✓	<p>The installation and operation of a hydropower scheme can have a number of significant impacts on ecology. These impacts include (but are not limited to):</p> <ul style="list-style-type: none"> • damage to ecology caused by the turbine; • disturbance to marine and terrestrial ecology during construction; • alteration to river flow regimes which may impact on biological water quality and habitat; • changes to water quality (e.g. as a result of pollutant discharges during the construction and operation of a scheme). <p>These effects may be more significant in areas designated for their ecological value/biodiversity interest.</p> <p>There may be opportunities to enhance river ecology as part of the development of a hydropower scheme for example, by increasing the movement of fish through the catchment through the provision of fish passes.</p>	<ul style="list-style-type: none"> • Undertake early consultation with the relevant local planning authority, Environment Agency and Natural England to establish potential effects and agree required environmental information to be provided at the planning application stage. • Consider early (in liaison with the Environment Agency, Natural England and the relevant local planning authority) design and operational measures to reduce ecological impacts and, where possible, enhance river ecology. Measures may include avoiding dense vegetation and trees used as habitats or corridors, timing of tree and shrub felling to avoid the bird breeding period (March to September) and surveys where vegetation removal is required. • Adopt a Construction Environment Management Plan to minimise adverse impacts associated with the construction phase. • Fully consider the potential impact of the scheme on the status of the water body and relevant Water Framework Directive targets. 	<ul style="list-style-type: none"> • Scheduling of site work to protect spawning salmonids. • Work to be carried out in accordance with agreed method statement. • Prevention of pollution procedures to be agreed. • Environmental Liaison Officer procedures to be agreed (on very sensitive sites). • Monitoring requirements to be agreed and carried out (on very sensitive sites).
Noise	✓		<p>The construction and operation of a hydropower scheme will generate noise which could have an impact on biodiversity and residential receptors. However, in most cases operational noise emissions are unlikely to adversely affect residents unless they are in very close proximity to the scheme.</p>	<ul style="list-style-type: none"> • Discuss potential noise impacts with relevant local planning authority officers (e.g. the Environmental Health Officer). • Explore how noise impacts can be reduced through the siting of the scheme (e.g. by locating elements away from residential properties) and by using natural screening (e.g. vegetation). 	<ul style="list-style-type: none"> • Noise limits from the turbine house to be set by condition. • Work to be carried out in accordance with agreed method statement. • Time limits to be set on use of contractors compound. • Time limits to be set on hours of working.

Key Planning Issue	Lead		Description	How the issue can be resolved	Potential planning conditions
	LPA	EA			
Transport	✓		Construction of hydropower schemes may involve significant transport requirements for excavated material, fill, ready-mixed concrete and turbine/electrical components (including abnormal indivisible loads (AIL)), which may result in noise and vibration nuisance, increased road safety hazards and damage to local roads.	<ul style="list-style-type: none"> • Undertake early consultation with the local highway authority (and the Highways Agency where appropriate). • Prepare a transport assessment or transport statement. • Define most suitable road access routes. • Arrange timing of movements to avoid sensitive periods (e.g. night time, school finish times). • Use barge transport to access the site where possible. 	<ul style="list-style-type: none"> • Timing of deliveries. • Number of HGV movements. • Routeing requirements. • Use of waterway transport.
Recreation (including fisheries) and access	✓	✓	<p>Hydropower schemes can obstruct river-based recreational activities such as canoeing. This may be as a result of the construction of a weir or reduced/increased river flows. Temporary diversions or closing of footpaths may also be necessary during construction which could impede access.</p> <p>Fishery interests are also an important consideration. Hydropower schemes can delays or obstruction to fish passage or cause damage to fish which pass through the turbine. However, there may be opportunities to increase the movement of fish through the catchment through the provision of fish passes.</p>	<ul style="list-style-type: none"> • Undertake early consultation with river users to ensure that their needs are fully understood. • Consider early (and in liaison with the Environment Agency, Natural England and the relevant local planning authority) design and operational measures to impacts to fisheries. These measures can include seasonal operation of the scheme, pulsed flow, provision of fish passes and screens. 	<ul style="list-style-type: none"> • Scheduling of site work to protect spawning salmonids. • Work to be carried out in accordance with agreed method statement. • Prevention of pollution procedures to be agreed. • Environmental Liaison Officer procedures to be agreed (on very sensitive sites). • Monitoring requirements to be agreed and carried out (on very sensitive sites).

Key Planning Issue	Lead		Description	How the issue can be resolved	Potential planning conditions
	LPA	EA			
Socio-economics	✓		<p>Any reduction or increase in water levels upstream or downstream as a result of the operation of a hydropower scheme could impact on commercial incomes from navigation and/or fisheries. Schemes also have the potential to create hazards or barriers to navigation.</p> <p>Hydropower schemes provide benefits in terms of increasing the proportion of electricity generated from renewable sources.</p> <p>Development of a hydropower scheme may generate a number of economic benefits including jobs creation/investment in local supply chains (associated with the design, installation and operation of a scheme). There will also be economic benefit derived from the electricity generated by the scheme. However, in some instances development could have an adverse impact on businesses in close proximity to the scheme (e.g. those associated with leisure/recreation).</p>	<ul style="list-style-type: none"> • Early consultation should be undertaken with the local navigation authority. • Undertake early consultation with users of the water body and river corridor. 	

Planning site audit checklist

Based on the issues identified, a checklist of key planning issues for consideration during the planning process is provided at **Appendix E**. The checklist has been designed to:

- help developers identify early the potential impacts of a proposal. This will help to clarify what issues may require further investigation and what design/siting changes could be made to avoid or mitigate impacts;
- support local planning authority officers in assessing the potential impacts of schemes and Environment Agency staff in responding to planning application consultations;
- inform pre-application discussions and provide an early indication as to the suitability of a proposal; and
- inform other stakeholders of the potential impacts of schemes so that they are able to contribute effectively to pre-application and formal consultations.

The Planning Site Audit Checklist has been designed to complement, and be used alongside, the Environmental Site Audit Checklist prepared by the Environment Agency.

Environment Agency Environmental Site Audit Checklist

The Environment Agency's Environmental Site Audit Checklist has been designed to assist developers in identifying potential environmental issues associated with their respective hydropower proposals and to help them understand the information that is likely to be required by the Environment Agency as part of the permit application process. It also helps Environment Agency staff assess potential environmental problems at the pre-application stage.

The Checklists cover the following areas:

- Water resources and hydromorphology
- Conservation
- Chemical and physical-chemical elements
- Fisheries and biodiversity
- Flood risk
- Navigation

The Checklist should be submitted to the Environment Agency together with the Hydroelectric-Power Scheme Pre-Application Form (Form WR315). Once received, the Environment Agency will assess the checklist and provide advice as to whether or not an application is likely to be successful and the information that would be required to support any application.

Form WR315: Good practice guidelines for hydroelectric power schemes - Environmental site audit checklist

We will work with you and your local planning authority to make sure, as far as possible, that you provide all the necessary information to enable an environmental report or environmental impact assessment.

Fill in the checklist (all sections) and send it to us with your pre-application form and any supporting information asked for in the notes.

1 Water resources and hydromorphology

We note that you may not have enough information to answer all questions in section 1 at the moment. In this case, the notes to the questions will give you an indication of the information you may need to provide on your application progress.

	Yes	No
Is the scheme 'high head' - that is more than ten feet? <i>(See note 1a for more information)</i>		
Will the scheme return all the water abstracted (passed) to the watercourse it was taken from? <i>(See note 1b for more information)</i>		
Will the scheme create any existing weir, channel, bar or other obstruction? <i>(See note 1c for more information)</i>		
Will the scheme raise the height of, or change the operation of, an existing weir in a way that increases the length of groundwater travel but back backed water or dries? <i>(See note 1d for more information)</i>		
Will the scheme create a new impoundment? <i>(See note 1e for more information)</i>		
Have you made an assessment of the existing hydrology of the site, which includes studying how you or better would affect the volume of water flow at the water head of all existing and proposed rivers, channels and so on? <i>(See note 1f and question 2 in the hydroelectric power pre-application form for more information)</i>		
Will the scheme place a channel (or pipe) for some high head schemes which is separate from the main watercourse? <i>(See note 1g for more information)</i>		
Will the scheme create flow in a river channel to become depleted (that is, will the flow in the river channel be reduced)? <i>(See note 1h for more information)</i>		
Will the scheme create an extended depleted reach? <i>(See note 1i for more information)</i>		
Will the scheme create flow at work to become depleted (that is, will the flow over a weir be reduced)? <i>(See note 1j for more information)</i>		
Are planned changes to the flow in depleted reaches likely to cause a significant change to the patterns and rates of sediment transport? <i>(See note 1k for more information)</i>		
Are the river conditions around the proposed site likely to make the water more turbid (cloudy with suspended matter) during the operation of the scheme? <i>(See note 1l for more information)</i>		
Is the proposed scheme or water body built with a generally good ecological status or good ecological potential under the Water Framework Directive? <i>(See note 1m for more information)</i>		
Do you have a right of access to the abstraction by means of the scheme? <i>(See note 1n for more information)</i>		

Notes

1a High head hydroelectric power schemes are normally in steep streams and rivers, where there is a significant gradient but a low volume of water. A high head scheme does not need much flow to generate electricity. However, the low volume, high head of water can create a barrier to the movement of fish and other aquatic life. You should consider the potential effects of the scheme on the river and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1b In the hydroelectric power scheme, the water is taken from the watercourse and made available to generate power. The water is then returned to the watercourse. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1c An obstruction is a barrier to the flow of water in a watercourse. It can be a weir, a channel, a bar, or a dam. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1d An extended depleted reach is a section of a watercourse where the flow is reduced for a significant distance. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1e An impoundment is a body of water that is held back by a dam or other structure. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1f A hydrological assessment is a study of the water cycle in a catchment area. It includes the study of the flow of water in rivers, streams, and groundwater. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1g A channel is a man-made or natural watercourse. It is a body of water that is used for the transport of water. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1h A depleted reach is a section of a watercourse where the flow is reduced. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1i An extended depleted reach is a section of a watercourse where the flow is reduced for a significant distance. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1j A weir is a barrier across a river or stream to raise the water level. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1k Sediment transport is the movement of soil and rock particles by water. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1l Turbidity is the cloudiness of water caused by suspended matter. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1m The Water Framework Directive is a European Union law that aims to protect and improve the quality of water in rivers, streams, and lakes. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

1n A right of access is a legal right to use a watercourse. You should consider the potential effects of the scheme on the watercourse and the surrounding area. You should also consider the potential effects of the scheme on the surrounding area.

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Key Messages

Developers should:

- complete environment and planning site audit checklists at the pre-application stage
- consider how planning and other environmental issues can be mitigated pre-design freeze
- take account of the relevant local planning authority's development plan as well as national planning policy in the location and design of proposals
- seek to identify key planning and other environmental issues as part of pre-application consultations and discussions

Local planning authorities and the Environment Agency should:

- direct developers to the environment and planning site audit checklists
- agree between LPA and the Environment Agency who should take the lead on specific technical areas
- for cross-boundary schemes, agree between LPAs as to whether one should take the lead

Tell us what you think

- **Have we identified the important planning issues? Can you think of any additional issues that need to be considered as part of this Guide?**
 - **Have we correctly identified which regulator should take the lead on key planning issues?**
 - **Are there any additional mitigation and enhancement measures that should be highlighted?**
 - **Are there any additional key messages that you think need to be addressed by the Guide?**
-

5. Other Guidance and Useful Contacts

Other Guidance

British Hydropower Association (2005) [A Guide to UK Mini-Hydro Developments](#)

Department for Communities and Local Government (various) [Planning Policy Guidance and Planning Policy Statements](#)

Department for Communities and Local Government (2000) [Environmental Impact Assessment: Guide to Procedures](#)

Department for Communities and Local Government (2011) [Draft National Planning Policy Framework](#)

Environment Agency (2009) [Good Practice Guidelines to the Environment Agency Hydropower Handbook](#)

Environment Agency (2010) [Hydropower: A Guide for You and Your Community](#)

Friends of the Peak District (2010) [Peak Power: Developing Micro Hydro Power in the Peak District](#)

Useful Contacts

Environment Agency

Tel: 08708 506 506

Email: enquiries@environment-agency.gov.uk

www.environment-agency.gov.uk

Climate East Midlands

www.climate-em.org.uk

Energy Saving Trust

Advice line: 0800 512 012

www.energysavingtrust.org.uk

English Heritage

www.english-heritage.org.uk

Natural England

www.naturalengland.org.uk

Ofgem

www.ofgem.gov.uk

Planning Portal - Local Planning Information Online

www.planningportal.gov.uk

Angling Trust

www.anglingtrust.net

Association of Rivers Trusts

www.associationofriverstrusts.org.uk

British Hydropower Association

www.british-hydro.org

Micro Hydro Association

www.microhydroassociation.co.uk

Friends of the Peak District

www.friendsofthepeak.org.uk

The Wildlife Trusts

www.wildlifetrusts.org

RSPB

www.rspb.org.uk

Ramblers Association

www.ramblers.org.uk

British Waterways

www.britishwaterways.co.uk

The Inland Waterways Association

www.waterways.org.uk

National Association of Boat Owners

www.nabo.org.uk

Tell us what you think

- Is there any additional guidance that you feel should be listed?
 - Are there any additional useful contacts that should be listed?
-

Appendix A: Planning Policy Context

Existing National Planning Policy

National planning policy (in England) is currently set out in Planning Policy Guidance notes (PPG), and their replacements Planning Policy Statements (PPS). The guidance contained within these documents may be relevant to decisions on planning applications for hydropower development.

PPGs and PPSs cover a wide range of planning issues, many of which may need to be considered as part of hydropower development proposals. Those that are likely to be most relevant to hydropower applications are summarised in the table below although developers and local planning authorities may need to consider other PPGs/PPSs depending on specific scheme details.

PPG/PPS	Summary
PPS1: Delivery Sustainable Development	Sets out the overarching national planning policy on the delivery of sustainable development through the planning system.
Planning Policy Statement: Planning and Climate Change - Supplement to Planning Policy Statement 1	<p>This PPS supplements PPS1 by setting out how planning should contribute to reducing emissions and stabilising climate change and take into account the unavoidable consequences. It sets out that local planning authorities should prepare, and manage the delivery of, spatial strategies that:</p> <ul style="list-style-type: none"> • make a full contribution to delivering the Government's Climate Change Programme and energy policies, and in doing so contribute to global sustainability; • in providing for the homes, jobs, services and infrastructure needed by communities, and in renewing and shaping the places where they live and work, secure the highest viable resource and energy efficiency and reduction in emissions; • deliver patterns of urban growth and sustainable rural developments that help secure the fullest possible use of sustainable transport for moving freight, public transport, cycling and walking; and, which overall, reduce the need to travel, especially by car; • secure new development and shape places that minimise vulnerability, and provide resilience, to climate change; and in ways that are consistent with social cohesion and inclusion; • conserve and enhance biodiversity, recognising that the distribution of habitats and species will be affected by climate change; • reflect the development needs and interests of communities and enable them to contribute effectively to tackling climate change; and • respond to the concerns of business and encourage competitiveness and technological innovation in mitigating and adapting to climate change. <p>Paragraph 11 sets out that local planning authorities should adhere to the following principles in determining planning applications:</p> <ul style="list-style-type: none"> • controls under the planning, building control and other regulatory regimes should complement and not duplicate each other; • information sought from applicants should be proportionate to the scale of the proposed development, its likely impact on and vulnerability to climate change, and be consistent with that needed to demonstrate conformity with the development plan and the PPS; and • specific and standalone assessments of new development should not be required where the requisite information can be made available to the planning authority through the submitted Design and Access Statement, or forms part of any environmental impact assessment or other regulatory requirement.

PPG/PPS	Summary
PPS5: Planning for the Historic Environment	<p>This PPS sets out planning policies on the conservation of the historic environment. Policy HE1 deals specifically with heritage assets and climate change and encourages the reuse of heritage assets to reduce carbon emissions including by allowing greater use of renewable energy. The policy states that, where proposals that are promoted for their contribution to mitigating climate change have a potentially negative effect on heritage assets, local planning authorities should, prior to determination, and ideally during pre-application discussions, help the applicant to identify feasible solutions that deliver similar climate change mitigation but with less or no harm to the significance of the heritage asset and its setting. Where conflict between climate change objectives and the conservation of heritage assets is unavoidable, the public benefit of mitigating the effects of climate change should be weighed against any harm to the significance of heritage assets in accordance with the development management principles in the PPS and national planning policy on climate change.</p> <p>Policies HE6 to HE12 deal with development management issues including information requirements which is supplemented by further detail contained within the Historic Environment Planning Practice Guide.</p>
PPS7: Sustainable Development in Rural Areas	<p>PPS7 sets out the planning policies for rural areas. Paragraph 16 states that in determining planning applications for development in the countryside, local planning authorities should provide for the sensitive exploitation of renewable energy sources in accordance with the policies set out in PPS22.</p>
PPS9: Biodiversity and Geological Conservation	<p>This PPS contains planning policies on the protection of biodiversity and geological conservation through the planning system. It stipulates that planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests and that local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.</p> <p>Where granting planning permission would result in significant harm to biodiversity interests, the PPS states that local planning authorities will need to be satisfied that the development cannot reasonably be located elsewhere or the harm mitigated. Where a planning decision would result in significant harm to biodiversity and geological interests which cannot be prevented or adequately mitigated against, appropriate compensation measures should be sought. If that significant harm cannot be prevented, adequately mitigated against, or compensated for, then local planning authorities should refuse planning permission.</p> <p>The Good Practice Guide to PPS9 provides further detail with respect to the information that may be required to support planning applications including ecological surveys.</p>

PPG/PPS	Summary
PPS22: Renewable Energy	<p>National planning policy on renewables is set out in PPS22. This encourages positive planning for renewable energy development and states that small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally. The PPS identifies the following locational considerations for renewable energy development:</p> <ul style="list-style-type: none"> • International designated sites • National designations • Green Belts • Buffer zones • Local designations <p>The Companion Guide to PPS22 (Planning for Renewable Energy) provides more detailed guidance with respect to development management issues and stipulates that:</p> <ul style="list-style-type: none"> • local authorities should be explicit in setting out what information they wish to be included in a planning application for a renewable energy scheme, and any supporting documentation. Pre-application discussion is strongly recommended; • issues of landscape and visual impact should be addressed at the scheme-specific level. Cumulative impacts should also be assessed and mitigated at this level; • local planning authorities should recognise that the landscape and visual effects will only be one consideration to be taken into account in assessing planning applications, and that these must be considered alongside the wider environmental, economic and social benefits that arise from renewable energy projects; • applications should be determined with reference to criteria-based plan policies and supplementary planning documents where applicable; • by comparison with most applications, there is likely to be an increased level of public interest in renewables schemes. This makes community involvement essential if the public is to be kept informed about the proposals. <p>The Companion Guide includes specific advice on hydropower schemes which has been reflected in this Guide where appropriate.</p>
PPS25: Development and Flood Risk	<p>PPS25 seeks to ensure that all forms of flooding are taken into account in the planning process and that flood risk is avoided. It requires the preparation of a Flood Risk Assessment for all proposals located in Flood Zones 2 and 3 which should identify and assess the risks of all forms of flooding to and from the development and demonstrate how these flood risks will be managed, taking climate change into account.</p>

Draft National Planning Policy Framework

Existing national planning policy is due to be replaced by the National Planning Policy Framework (NPPF). Consultation on the draft NPPF ended in October 2011 and it is expected that the final document will be published in 2012.

The draft NPPF sets out that the Government's objective is for planning to fully support the transition to a low carbon economy. It states that planning should:

“secure, consistent with the Government's published objectives, radical reductions in greenhouse gas emissions, through the appropriate location and layout of new development, and active support for energy efficiency improvements to existing buildings and the delivery of renewable and low-carbon energy infrastructure.”

This section of the Guide will be updated once the NPPF has been finalised.

Appendix B: The Water Framework Directive

The Water Framework Directive (WFD)¹¹ sets objectives for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'Good Status' via a series of six year River Basin Planning cycles. The default target for all water bodies is to achieve at least 'Good Status' by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed until 2021 or 2027. The Directive came into force in 2000 and was transposed into UK law in 2003. Although the Environment Agency is the lead public body charged with implementing the WFD, other public bodies also have a duty to contribute towards compliance.

For surface waters, good status is a statement of 'overall status' and has an ecological and a chemical component. Good Ecological Status (GES) is measured on the scale of high, good, moderate, poor and bad. Chemical status is measured as good or fail. Good ecological status applies to natural water bodies and is defined as a slight variation from undisturbed natural conditions. The ecological status of water bodies is determined by examining biological elements (e.g. fish, invertebrates, plants) and a number of supporting elements and conditions, including chemical, hydrological and hydromorphological factors.

Where water bodies have been modified to enable a particular use, such as water supply, flood protection or navigation, and because of this are not able to achieve good ecological status without significant adverse effects on the use, the water body may be designated as a heavily modified water body (HMWB) or artificial water body (AWB) and WFD objectives are then measured against ecological potential, rather than ecological status.

For a HMWB or AWB to achieve Good Ecological Potential (GEP) the following criteria must be satisfied:

- its water chemistry must meet the requirements of Good Status;
- the modifications to the structural or physical nature of the water body that might harm biological quality must only be those essential for its valid use;
- all other modifications must be altered or managed to reduce or remove their adverse impact so that there is the potential for the ecology to be as close as possible to that of a similar natural water body (the mitigation measures required to enable achievement of good ecological potential in each water body are listed in the River Basin Management Plan).

For groundwater bodies, good status has a quantitative and a chemical component. Together these provide a single final classification of either good or poor status.

¹¹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy

In order to be compliant with the requirements of the Water Framework Directive, the delivery of any scheme must:

- ensure that there would be **no deterioration** in any of the biology, chemistry or hydromorphology quality elements;
- look for **opportunities to deliver any morphological mitigation measures** that are not currently in place;
- ensure that the **operation of existing mitigation measures is not compromised** or restricted; and
- ensure that the **future delivery of any additional mitigation measures is not compromised** or restricted.

Environment Agency guidance¹² describes the process of assessing new developments for compliance with the WFD. In summary, such assessments need to consider the following key questions.

1. At the water body level, on a non-temporary basis, will the option result in deterioration of any of the elements from one status class to the next e.g. good to moderate?
2. Will the option prevent the water body from achieving good ecological potential/status?
3. Can the scheme assist in the delivery of any River Basin Management Plan (RBMP) measures as part of compliance, e.g. if the water body is artificial or heavily modified, can it include implementation of any mitigation measures identified in the RBMP as needing to be put in place, but not yet in place, to help the water body achieve good ecological potential?

Where hydropower schemes are fitted to existing weirs, they are less likely to breach Water Framework Directive requirements for physical modification of water bodies, although, where an existing weir is identified in a RBMP as preventing achievement of good ecological status/good ecological potential, careful consideration should be given to the ability to comply with WFD requirements.

¹² *Assessing New Modifications for Compliance with WFD: detailed supplementary guidance* Document 488_10_SD01. It should be noted that this is a 'living document' and it is expected that changes will be made. It is also a document that has been produced for an internal Environment Agency audience, with the intention of providing external guidance in the future.

Where hydropower schemes require a new impoundment (e.g. new weir) then they are more likely to affect the status of the water body and this must be assessed as part of the permitting process. In these circumstances, any adverse impacts upon the ecological status should be fully mitigated. Where deterioration in ecological status cannot be avoided or mitigated then hydropower schemes may not fail to meet WFD requirements provided that their impact is solely due to physical modification of the water body and that:

- adverse impacts are mitigated as far as possible;
- the reasons for the modification are reported in the River Basin Management Plan;
- the benefits of good ecological status are outweighed by the benefits of the hydropower scheme to human health, human safety or to sustainable development; and
- the benefits cannot be achieved by other means, technically or at disproportionate cost, and there is no significantly better environmental option.

There are eleven River Basin Management Plans prepared for England and Wales, which are available on the Environment Agency's website at: www.environment-agency.gov.uk/wfd

Appendix C: The Habitats Directive

Requirements of the Habitats Regulations

Part 6 of the Conservation of Habitats and Species Regulations 2010 (S.I. No. 490) requires that a competent authority¹³ must undertake an appropriate assessment of the implications for European sites designated under the Habitats Directive¹⁴ or classified under the Wild Birds Directive¹⁵ before deciding to undertake or give any consent, permission or other authorisation for a plan or project which is not directly connected with or necessary for the management of the sites, but which is likely to have a significant effect on such sites (either alone or in combination with other plans or projects). Under UK policy, the same requirements apply to Ramsar sites¹⁶.

Local planning authorities and the Environment Agency are competent authorities in relation to hydropower schemes. Sometimes the developer may also be a competent authority, for example in the case of development at a reservoir by a water company.

First there is a need to screen the project to determine whether there is a 'Likely Significant Effect' (LSE) on European or Ramsar sites. Natural England must be consulted at this stage. If a LSE is identified, then an appropriate assessment of the effects of the project of the integrity of the site will be required. If an adverse effect is found, the project may not go ahead unless it can be shown that there are no alternatives and that the project is required for imperative reasons of overriding public interest sufficient to justify potential adverse effects on the European/Ramsar site(s). In such a case, any necessary compensatory measures must be put in place to ensure that the overall coherence of the network of European sites (Natura 2000) is protected. This process (including assessment of LSE and appropriate assessment) is referred to as a Habitats Regulations Assessment (HRA).

Competent authorities may agree to cooperate in undertaking the HRA¹⁷.

The Habitats Regulations only specifically apply to Special Areas of Conservation (SACs), candidate SACs (cSACs), Sites of Community Importance (SCIs) and Special Protection Area (SPAs). However, UK policy extends the requirements for HRA to include Ramsar sites and potential SPAs (pSPAs), including proposed extensions or additions to existing SPAs.

¹³ See Regulation 7 of *The Conservation of Habitats and Species Regulations 2010*

¹⁴ SACs are designated by the European Commission under the Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) (the 'Habitats Directive') (as amended) on the recommendation of the member state.

¹⁵ SPAs are classified by the member state under the Council Directive on the Conservation of Wild Birds (79/409/EEC) (the 'Birds Directive') or Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (the 'new Birds Directive') and protected under Article 6 of the Habitats Directive.

¹⁶ Ramsar Sites are listed by the relevant signatory state under the Convention on Wetlands of International Importance, particularly as Waterfowl Habitat, Ramsar, Iran, 1971.

¹⁷ See Regulation 65 of *The Conservation of Habitats and Species Regulations 2010*

Relevance to hydropower schemes

Hydropower schemes have the potential to affect interest features of riverine European sites due to the physical presence of structures or, more likely, by alterations in flow regime and/or water quality. Effects may occur in a depleted reach, due to reduction in flow, or downstream due to changes in flow regime. In the case of releases from deep reservoirs in particular, operation may also lead to changes in water temperature and chemical quality downstream. Where reservoirs are themselves European sites, installation of hydropower schemes may affect the drawdown regime, with consequent effects on the interest features of the site. Terrestrial European sites may be affected by the presence of scheme structures (including access roads) and by human activity associated with the scheme, particularly during construction. Where any potential for such effects is identified, a Habitats Regulations Assessment must be undertaken. The developer will normally be expected to provide the competent authority with all the necessary information to enable it to undertake the HRA.

Appendix D: Environmental Impact Assessment

What is Environmental Impact Assessment?

Environmental Impact Assessment (EIA) is required for certain types of proposals before planning permission can be granted. Through an Environmental Statement, the EIA process draws together information and assesses the likely significant environmental effects of a project, enabling issues to be properly understood by the public and the relevant competent authority before it makes its decision.

For developers, EIA encourages environmental considerations to be taken into account during development design, avoiding delay during the application process. For the local planning authority and the Environment Agency, the EIA process provides a better basis for making decisions.

When is EIA required for hydropower schemes?

Hydropower schemes with a capacity of over 500kW may require Environmental Impact Assessment (EIA)¹⁸ although Planning Circulars 02/99¹⁹ (England) and 11/99²⁰ (Wales) on Environmental Impact Assessment explain that an Environmental Statement is more likely to be required for a hydropower development with more than 5MW (5000kW) of generating capacity. However, this is an indicative threshold²¹. Proposals that are located within sensitive areas²² may require EIA regardless of their capacity.

Each hydropower scheme should therefore be considered on an individual basis to determine whether specific sensitivities may trigger the need for an Environmental Statement. In particular, the characteristics and location of the development and the magnitude, duration and character of any potential impacts, need to be considered.

Where there is a possibility that a proposed development will require EIA, developers should consult the relevant planning authority well in advance of a planning application. Developers can decide to submit an Environmental Statement with their application, in which case the development is automatically treated as EIA development', or they may wish to seek a formal 'screening opinion' from the local planning authority as to whether an ES is required. In support of a request for a screening opinion²³, developers must provide a site plan, description of the development and an assessment of possible effects on the environment.

¹⁸ The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (SI No.1824) (the EIA Regulations) include "installations for hydroelectric energy production" within Schedule 2 paragraph (3)(h).

¹⁹ Available at: <http://www.communities.gov.uk/documents/planningandbuilding/pdf/155958.pdf>

²⁰ Available at http://wales.gov.uk/docrepos/40382/epc/planning/403821/660124/11_99.pdf

²¹ An updated version of the Circular was issued for consultation in 2006 but not yet been finalised, which removed all indicative thresholds and strengthened the need for a case-by-case review of the need for an Environmental Statement.

²² As defined in Regulation 2(1) to the EIA Regulations

²³ Under Regulation 5 of the EIA Regulations.

What information should be included in an Environmental Statement for a hydropower scheme?

Before making a planning application, the developer may ask the local planning authority to provide, in writing, an opinion as to the information that should be provided in the Environmental Statement²⁴. This is known as a scoping opinion and can be requested at the same time as a screening opinion.

Any formal scoping request will require LPA to consult the Environment Agency. The Environmental Statement must include information on significant effects of the scheme on population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors, as far as each is relevant. The Environment Agency has produced EIA Scoping Guidelines, which include hydropower schemes²⁵ specifically.

As Environment Agency permits may also require an EIA, pre-application discussions should be held between the local planning authority, Environment Agency staff and the developer, to agree the scope of the assessment required and consider whether a single Environmental Statement would be sufficient for both purposes (this is recommended).

The emphasis of an Environmental Statement is on the ‘significant’ environmental effects to which a hydropower development is likely to give rise. The level of detail the Environment Agency will expect to see in an Environmental Statement will be proportionate to the environmental risks and appropriate to the site-specific conditions.

²⁴ Under Regulation 13 of the EIA Regulations.

²⁵ Environment Agency (2002) *EIA Scoping Guidelines – guidance notes for 76 development types*. Produced under R&D Project W4-004.

Appendix E: Supporting Information Checklist

This table shows

Supporting Document/Information	Description	Planning	EA Permits
Scheme details	This should include a description of the proposal and its location as well as details of grid connection works, including transformer and transmission lines	✓	✓
Plans	These should include maps and diagrams and may include the following: <ul style="list-style-type: none"> • Location plan showing the application site • Site plan showing the location of intake, pipeline, turbine house, tailrace and other elements of the scheme • Existing and proposed elevations • Existing and proposed floor plans • Roof plans 	✓	✓
Design and Access Statement	This should provide details of the extent, layout, scale, landscaping and appearance of the proposal.	✓	
Details of vehicular access and movements	This information is likely to include details of means of vehicular access and the number and frequency of vehicle movements during both the construction and operation of a scheme.	✓	
Details of provision for fish passes (where required)	This may be required to highlight what measures have been incorporated to enable fish to pass safely downstream and upstream at the intake structure.		✓
Details of fish screening measures	This may be required to highlight the measures incorporated to prevent fish from entering the turbine. This information should include: <ul style="list-style-type: none"> • the type of fish screen – such as mesh screens, vertical or inclined bar racks, coanda screens (wedge-wire spillway screens); • size of the intake screen, in millimetres (mm); • dimensions (width × height) of the screen in millimetres (mm); • angle of the intake screen (in degrees) in relation to the main flow path. This should be adequate to effectively guide fish to the bypass channel; • the approach velocity, for the intake screen only, in metres per second; and • the 10-figure National Grid Reference of the intake screen. 		✓
Details of the bywash channel	The design of a bywash channel is critical to the performance of any fish screen placed within a channel. The entrance to a bywash should be where the fish have the best chance of finding it. It will be necessary to state whether the bywash is a separate channel, if the fish pass forms part of the bywash channel, and the dimensions.		✓

Supporting Document/Information	Description	Planning	EA Permits
Alternative screening methods	Alternative screening methods such as behavioural fish barriers can be used where physical screens are not practical. Behavioural fish barriers include louvre bar, acoustic, BAFF and strobe lighting.		✓
Land contamination	Identifying the existing and previous uses of the site will give an indication of the possibility of contamination. A preliminary risk assessment is likely to be required to help determine whether a site investigation and more detailed risk assessment would be needed. Further information is available in Planning Policy Statement 23: Planning and Pollution Control.	✓	✓
Details of site management measures during the construction phase	The construction of a hydropower scheme may result in the siltation of water courses as well as adverse impacts on sensitive habitats and others receptors (e.g. due to disturbance from construction machinery). A site management plan can help avoid/minimise these impacts by ensuring that construction is undertaken sensitively.	✓	✓
Photomontages	Photomontages are likely to be required to demonstrate the landscape/visual impact of a hydropower scheme.	✓	
Details of the power from the installation (in kW) and anticipated efficiency	Details should be provided of the power from the installation (in kW) and anticipated efficiency as well as what the energy will be used for (if applicable)	✓	✓
Flood Risk Assessment	Development on or adjacent to a river may have an impact on flood risk and it is likely that applications for hydropower schemes will need to be accompanied by a Flood Risk Assessment. Further guidance on Flood Risk Assessments is contained within Planning Policy Statement 25: Development and Flood Risk.	✓	✓
Water Framework Directive assessment	Hydropower development may affect ecological status /potential and supporting elements assessed in River basin Management Plans. Schemes will need to be assessed to determine whether they will lead to any change in status or prevent the achievement of targets. Deterioration is not permitted under the Directive unless fully justified under Article 4.7		✓

Supporting Document/Information	Description	Planning	EA Permits
Assessment of hydrology	<p>This assessment will need to include analysis on how the proposed scheme will affect the volume of water flow, or water level, within all channels present or proposed. This should fully explain the effect the scheme will have on the flow and level of water over any structures in the river, such as weirs or fish passes.</p> <p>The assessment will need to include the following:</p> <ul style="list-style-type: none"> • an overview of the catchment hydrology; • hydrometric information (current meter gaugings, gauging station data, model data, rainfall data); • a pre-scheme assessment (flow survey) of all channels included within the scheme; • assessment of the change in flow within all channels affected; • seasonal variation in flows; • base flow/run-off comparison; • assessment of high-flow events (management of structures, relief channels); • reduction in downstream levels; • raising of upstream levels; and • residual flows downstream of intake needed to protect the river and other interests. 		✓
Flow duration statistics	<p>The flow duration curve (FDC) represents the statistical availability of any given flow, based on best available information. The FDC and associated information can indicate the volume of flow which is available for any percentage of the time.</p>		✓
Prescribed flow	<p>The prescribed flow is the flow that must be maintained in the depleted reach of a watercourse when the hydropower scheme is operating to protect the river, the environment and the appearance of the site. This can also include the flow needed to maintain the effectiveness and the efficiency of a fish pass.</p>		✓

Appendix F: Indicative plans for different types of hydropower installation

Drawings are to be added

Appendix G: Planning Site Audit Checklist

This appendix provides checklists to aid identification of the main planning issues, set out under the main planning issues identified in this guidance. It is principally aimed at developers of hydropower schemes. Where a green box is ticked, generally no further action will generally be required relating to that topic. Where a red box is ticked, the notes below the checklist give guidance on development constraints or on extra work that may be required. It may be helpful to the local planning authority if completed checklists are included with the planning application.

1. Landscape/Visual

Question	Yes	No
Is the scheme within and/or likely to have an impact on a World Heritage Site? (See note 1a for more information)		
Is the scheme within and/or likely to have an impact on a National Park? (See note 1a for more information)		
Is the scheme within and/or likely to have an impact on an Area of Outstanding Natural Beauty? (See note 1a for more information)		
Is the scheme within and/or likely to have an impact on a Conservation Area? (See note 1b for more information)		
Is the scheme within and/or likely to have an impact on a Special Landscape Area? (See note 1c for more information)		
Will the scheme have any impact on landscape character? (See note 1d for more information)		
Will the scheme result in an adverse impact on visual amenity? (See note 1e for more information)		

Notes:

1a: World Heritage Sites, National Parks and Areas of Outstanding Natural Beauty have exceptionally high landscape value and are protected at the international or national level. The management objectives of these areas may be to conserve existing character.

1b: Section 69 of the Civic Amenities Act 1967 gives local councils the power to designate as Conservation Areas, "areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". Designation gives control over the demolition of buildings and provides the basis for policies designed to preserve or enhance all the aspects of character or appearance that define an area's special interest. Guidance on development within a Conservation Area should be sought from the local planning authority.

1c: Special Landscape Areas provide protection for locally significant landscapes. Development within a Special Landscape Area will need to accord with relevant development plan policies.

1d: In determining impact on landscape character, consideration should be given to the following:

- The sensitivity of the existing landscape in terms of value, condition and capacity
- The anticipated size and built form of the scheme
- Whether the scheme be well integrated into the existing landscape
- Whether the scheme be concealed by existing and/or new vegetation/tree cover

1e: Visual effects may include the following:

- visual obstruction: physical blocking of a view;
 - visual intrusion: the visual intrusion of the proposed development into an existing view or loss of particular landscape elements or features already present in the view;
 - cumulative visual effects: the cumulative or incremental visibility of similar types or scales of development may combine to have a cumulative visual effect. This may concern 'intervisibility' where more than one development may be viewed simultaneously from a viewpoint, or occur sequentially where developments may be viewed from a number of differing locations, most commonly from a road, rail route or long distance path.
-

2. Cultural Heritage

Question	Yes	No
Has a desk-based assessment of cultural heritage assets been undertaken? (See note 2a for more information)		
Has on-site evaluation taken place? (See note 2b for more information)		
Is the scheme within and/or likely to have an impact on a World Heritage Site? (See note 2c for more information)		
Does the proposed site contain, or is development likely to have an impact on, a Scheduled Monument or its setting? (See note 2d for more information)		
Does the proposed site contain, or is development likely to have an impact on, on a Listed Building? (See note 2e for more information)		
Is the scheme within and/or likely to have an on a Registered Park or Garden? (See note 2f for more information)		
Is the scheme within and/or likely to have an impact on a Registered Battlefield? (See note 2g for more information)		
Is the scheme within and/or likely to have an impact on a Conservation Area? (See note 2h for more information)		
Is the scheme within and/or likely to have an impact on any other heritage assets including those identified by the local planning authority? (See note 2i for more information)		

Notes:

2a: A desk-based assessment should identify the heritage assets that may be affected by the scheme using existing information (e.g. national and local records, aerial photographs and existing surveys) with the aim being to establish baseline conditions and inform what further investigation may be required (if any). This will also require an assessment of the significance of the asset (as not all cultural heritage features will be of equal “importance”) and the impact on that significance (e.g. the extent to which the scheme changes or damages a feature or affects its setting). This is in accordance with Planning Policy Statement 5: Planning for the Historic Environment (PPS5) which requires all applicants to provide a level of information that is proportionate to the significance of the cultural heritage assets and the potential impact upon that significance of the proposal. This assessment should be included in the Design and Access Statement (and, potentially, any Environmental Report or Environmental Statement produced).

The desk-based assessment may require pre-application consultation with local planning authority officers and the County Archaeologist as well as English Heritage. The [Institute for Archaeologists](#) has published standards and guidance for desk-based assessments.

2b: In some instances it may be necessary to undertake an on-site evaluation to further assess potential impacts on heritage assets. On-site evaluation may comprise penetrating radar, trial-trenching, test-pitting, field-walking, x-ray and other forms of remote-sensing, geo-archaeological borehole investigation, opening-up and building analysis. The [Institute for Archaeologists](#) has published standards and guidance for on site evaluation.

2c: World Heritage Sites are inscribed by the UNESCO World Heritage Committee for their Outstanding Universal Value. Where a proposal may affect a World Heritage Site or its setting, including any buffer zone, developers should consult English Heritage as well as the local planning authority. It will be necessary for development to accord with the policies of the relevant development plan (so far as they relate to World Heritage Sites) and the respective World Heritage Site Management Plan will also be an important material consideration.

Further guidance is available in [CLG Circular 07/09: Protection of World Heritage Sites](#) and accompanying English Heritage guidance. A list of World Heritage Sites is available from the [National Heritage List for England](#) (English Heritage).

2d: Scheduled Monuments are designated under the Ancient Monuments and Archaeological Areas Act 1979 by the Secretary of State for their national importance. Works to a Scheduled Monument will require Scheduled Monument consent from the Secretary of State. Where a scheme may either directly affect a Scheduled Monument or its setting pre-application consultation should be undertaken with English Heritage and the relevant local planning authority officer/county archaeologist).

Further guidance is available from the Department for Culture, Media and Sport²⁶. A list of Scheduled Monuments is available from the [National Heritage List for England](#) (English Heritage).

2e: Listed Buildings are designated under the Planning (Listed Buildings and Conservation Areas) Act 1990 by the Secretary of State for their special architectural or historic interest. Listed Building Consent will be required for schemes involving the demolition of, or alteration (which would affect its character) to, a Listed Building. For development affecting a Grade I or Grade II* Listed Building or its setting it is recommended that pre-application discussions are held with English Heritage (English Heritage must be notified by a local planning authority for development affecting the setting of a Grade I or Grade II* Listed Buildings outside Greater London).

A database of Listed Buildings is available from the [National Heritage List for England](#) (English Heritage).

2f: Registered Parks and Gardens are designated by English Heritage under the Historic Buildings and Ancient Monuments Act 1953 for their special historic interest. Separate consent is not required but local planning authorities must consult English Heritage on applications affecting Grade I or II* Registered Parks and Gardens. Pre-application consultation with English Heritage and the relevant local planning authority officer/county archaeologist is encouraged for schemes within, or which may affect the setting of, a Registered Park and Garden. It will also be necessary for development in these instances to accord with the relevant policies of the respective development plan.

A list of Registered Parks and Gardens is available from the [National Heritage List for England](#) (English Heritage).

2g: Registered Battlefields are designated by English Heritage on a non-statutory basis. There is no requirement to consult English Heritage over planning applications which affect Registered Battlefields however, developers may wish undertake pre-application consultation with English Heritage and the relevant local planning authority

²⁶ Department for Culture, Media and Sport (2010) Scheduled Monuments: Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979

officers/County Archaeologist in these instances. It will also be necessary for development which may affect a Registered Battlefield to accord with the relevant policies of the respective development plan.

A list of Registered Battlefields is available from the [National Heritage List for England](#) (English Heritage).

2h: Section 69 of the Civic Amenities Act 1967 gives local councils the power to designate as Conservation Areas, "areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance". Designation gives control over the demolition of buildings and provides the basis for policies designed to preserve or enhance all the aspects of character or appearance that define an area's special interest. Guidance on development within a Conservation Area should be sought from the local planning authority.

2i: Heritage assets may include non-designated sites and in this respect Planning Policy Statement 5: Planning for the Historic Environment sets out that the absence of designation for such heritage assets does not indicate lower significance and that they should also be considered. Developers should seek advice about the presence and significance of these assets via the relevant local planning authority officer/county archaeologist and consult the local Historic Environment Record and local lists.

3. Water

Question	Yes	No
Could the scheme alter drainage systems in such a way as to increase the risk of water pollution? (see note 3a for more information)		
Will the scheme involve any works where contaminated land will be disturbed, leading to pollution risk? (see note 3b for more information)		
Have adequate procedures been developed to ensure that water pollution is avoided during the construction phase? (see note 3c for more information)		
Could the scheme lead to increased bank erosion? (see note 3d for more information)		
Will any new impoundment lead to submergence of any valued features of the local environment? (see note 3e for more information)		
Will the scheme involve a depleted river reach? (see note 3f for more information)		

Notes:

3a: This is mainly likely to apply where new access routes have to be established across previously unpaved areas.

3b: The local authority should be consulted for information on the contaminated land register. If further investigation is warranted, historic mapping should be consulted regarding past uses and site investigation undertaken as appropriate.

3c: Developers should show that their scheme is in accordance with relevant Environment Agency Pollution Prevention Guidance notes and that dewatering arrangements are satisfactory. Particular risks arise from work in the water. The Environment Agency will be able to advise on this issue.

3d: Increased bank erosion, potentially leading to loss of useable land, loss of footpaths etc could arise in the immediate locality of the scheme if flow from the turbine or tailrace is directed towards the bank. Bank protection may be required in such cases.

3e: As well as direct loss of property, land and access routes, which will be the main concerns in the case of a major new reservoir, small changes in impoundment levels may lead to changes in character that represent loss of amenity of the river corridor, as well as changes to riparian habitats.

3f: Creation of a flow-depleted river reach may lead to changes in flora and fauna and/or loss of amenity.

4. Flood Risk

Question	Yes	No
Will the scheme increase the risk of flooding, either by reducing the cross section or by slowing flows? (See note 4a for more information)		
Does the scheme propose any alterations to structures, or building new structures in the river (such as weirs, dams, culverts or outfalls), or affect existing flood defences (such as embankments or walls)? (See note 4a for more information)		
Does the scheme create new channels or change the flow path in any way? (See note 4a for more information)		
Does the scheme propose to deepen any existing channels? (See note 4a for more information)		
Is the scheme in the floodplain as shown on the Environment Agency's flood map? (See note 4a and 4b for more information)		
Will the scheme change the available access to the river or neighbouring flood defences for maintenance (for example, by building fences or walls around new structures, or installing overhead cables)? (See note 4c for more information)		
Does the scheme reduce the available floodplain area or block potential routes of floods over land? (See note 4c for more information)		
Does the scheme create a new raised reservoir with the capacity of 25,000 cubic metres or more? (See note 4d for more information)		
Could the cumulative effect of the proposal along with other proposals increase the risk of flooding or have a negative effect on land drainage? (See note 4a for more information)		

Notes:

4a: Flood defence consent is likely to be required for these activities and pre-application consultation should be undertaken with the [Environment Agency](#). A Flood Risk Assessment will also be required in support of the planning application, in accordance with the requirements of Planning Policy Statement 25: Development and Flood Risk.

4b: Flood maps are available from the Environment Agency's [website](#).

4c Operating authorities on main rivers, Internal Drainage Boards, and local authorities, have responsibilities to maintain watercourses to reduce the risk of flood. This is particularly important at river-control structures which may need to be maintained and cleared of debris. For this reason, vehicles need to be able to get access to these structures, and people need to be able to work safely around them.

3d Structures of this size will qualify as statutory reservoirs, and need to be designed and inspected as such. See the Environment Agency's [website](#) for further information.

5. Biodiversity

Question	Yes	No
Is the scheme (including any new access route) within, or likely to affect, a Site of Special Scientific Interest (SSSI)? (See note 5a for more information.)		
Is the scheme (including any new access route) within, or likely to affect, a Special Area of Conservation (SAC)? (See note 5b for more information.)		
Is the scheme (including any new access route) within, or likely to affect, a Special Protected Area (SPA)? (See note 5c for more information.)		
Is the scheme (including any new access route) within, or likely to affect, a national nature reserve? (See note 5d for more information.)		
Is the scheme (including any new access route) within, or likely to affect, a local nature reserve? (See note 5d for more information.)		
Have formal ecological surveys been carried out on the site? (See note 5e for more information.)		
Does the scheme take account of protected species that may live at the site or nearby? (See note 5f for more information.)		
Is the scheme (including any new access route) likely to have a significant affect on non-designated habitats or species? (See note 5g for more information.)		

Notes:

5a: You can get a map of the Welsh Sites of Special Scientific Interest (SSSI) from the Countryside Council for Wales website (www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/protected-sites-map.aspx). You can get a map of English Sites of Special Scientific Interest from Natural England's website (www.natureonthemap.org.uk). A scheme is likely to affect a site of special scientific interest if parts of it are in the site, the scheme alters the river flow through the site or creates an obstacle to fish migration. If a scheme is likely to affect a Site of Special Scientific Interest you will need to assess whether the proposal is likely to damage the site, considering why it was designated as a Site of Special Scientific Interest. The Countryside Council for Wales (CCW) or Natural England (NE) must be formally told about any work that may damage a Site of Special Scientific Interest.

5b: You can get a map of the Welsh Special Areas of Conservation from the Countryside Council for Wales' website (www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/protected-sites-map.aspx). You can get a map of English Special Areas of Conservation from Natural England's website (www.natureonthemap.org.uk/map.aspx?m=int_sites). There is more information on all Special Areas of Conservation in the UK on the website at www.jncc.gov.uk/page-1458. A scheme is likely to affect a Special Area of Conservation if it would remove or change the vulnerable natural habitats the site was designated for. If a scheme is likely to affect a Special Area of Conservation, a Habitats Regulations Assessment will be required (see Appendix C).

5c: There is a list of all Special Protected Areas in the UK on the JNCC Full UK SPA site list (www.jncc.gov.uk/page-1400). A scheme is likely to affect a Special Protection Area if it removes or changes

natural habitats that are important to the rare and vulnerable birds the site was classified for or affects the use of the site by birds. If your scheme is likely to affect a Special Protection Area, a Habitats Regulations Assessment will be required (see Appendix C).

5d: You can get a map of all national and local nature reserves from the Natural England website (www.natureonthemap.org.uk/map.aspx?map=nreserves) and the Countryside Council for Wales website (www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/protected-sites-map.aspx). The reserves are managed by different authorities, including local government. A scheme might affect a reserve if it is in one or it alters the river flow through one.

5e: Ecological surveys are likely to be required on schemes in designated rivers or affecting designated terrestrial areas or where designated aquatic or terrestrial species or habitats may be affected. The potential risks to those species and habitats will need to be considered. The exact requirements of any survey will depend on the specific site and the proposed scheme, the amount of existing information, and whether any vital information is missing.

5f: You can find information on protected species in Wales by visiting the website at www.ccw.gov.uk/landscape--wildlife/habitats--species/species-protection.aspx.

You can get information on protected species in England by visiting the website at www.naturalengland.org.uk/ourwork/regulation/wildlife/species/europeanprotectedspecies.aspx. If a European protected species is likely to be affected by a scheme, a protected species licence from Natural England or the Countryside Council for Wales may be required.

5g: For aquatic habitats, both the local planning authority ecologists and the Environment Agency ecologists should be consulted.

6. Noise and Vibration

Question	Yes	No
Are there any residential properties in close proximity to the site and which could be affected by noise and vibration from construction activities? (See note 6a for more information)		
Are there any other noise sensitive uses or receptors in close proximity to the site and which could be affected by noise and vibration from construction activities? (See note 6a for more information)		
Are there any residential properties in close proximity to the site which could be affected by emissions of noise from the operation of the scheme? (See note 6a for more information)		
Are there any other noise sensitive uses or receptors in close proximity to the site and which could be affected by emissions of noise from the operation of the scheme? (See note 6a for more information)		

Notes:

6a: Planning Policy Guidance 26: Planning and Noise (PPG26) identifies residential properties as being particularly noise sensitive although it does cite developments such as offices, hospitals and schools as containing buildings and activities that are potentially noise sensitive. It may also be important to consider whether the construction or operation of the scheme could affect the enjoyment of designated and non-designated areas of landscape, wildlife and historic value.

The magnitude of noise impacts is determined by two key factors - the amount of increase in noise levels to the development (a change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to doubling the loudness of a sound) and the total amount of noise that will occur. Pre-application consultation should be undertaken with the local planning authority Environmental Health Officer where noise/vibration may impact upon sensitive receptors from either the construction or operation of the scheme and noise monitoring at agreed locations/modelling may be required to inform a noise assessment.

7. Transport

Question	Yes	No
Is the site accessible from a main highway? (See note 7a for more information)	Green	Red
Will the construction or operation of the scheme increase delays and congestion at nearby junctions? (See note 7b for more information)	Red	Green
Can waterway transport by barge be used in the construction of the scheme, especially for abnormal indivisible loads (AIL)	Green	Red
Are infrastructure improvements (e.g. junction enhancements) required to accommodate construction traffic? (See note 7c for more information)	Red	Green
Are infrastructure improvements (e.g. junction enhancements) required to accommodate traffic related to the operation of the scheme? (See note 7c for more information)	Red	Green
Will the construction or operation of the scheme impact upon the strategic road network? (See note 7d for more information)	Red	Green
Will the scheme generate 30 or more two-way vehicle movements in any hour or 100 or more two-way vehicle movements per day? (See note 7e for more information)	Red	Green
Will the scheme generate significant HGV or abnormal load movements? (See note 7e for more information)	Red	Green
Is the scheme located within an Air Quality Management Area? (See note 7e for more information)	Red	Green

Notes:

7a: Creation of a new access or enhancement to an existing access may be required to support the construction and/or operation of the scheme. In these instances works (either temporary or permanent) may be required to the existing road network and where this is the case, pre-application consultation should be undertaken with the local highway authority.

Where land that is not in the ownership of the scheme's developer is required to accommodate site access it will be important that any land ownership issues have been resolved. In this respect, it should be noted that Environment Agency abstraction licenses will only be granted if access rights have been secured for land directly adjoining the river.

7b: Whilst in the majority of cases the operation of a small-scale hydropower scheme is unlikely to generate a significant increase in traffic, construction works may cause congestion especially where they involve abnormal loads. This may require the preparation of a Transport Statement and pre-application consultation should be undertaken with the local highway authority to determine supporting information requirements and what, if any, mitigation may be required.

7c: Accommodation of operational traffic and (more likely) construction traffic may require enhancement to the existing road network (e.g. to accommodate abnormal loads). Where this is the case, pre-application consultation should be undertaken with the local highway authority.

7d: The Highways Agency should be informed by the local planning authority of any proposals that are likely to impact on the strategic road network. In these instances, developers should undertake pre-application consultation with the Highways Agency.

7e: In these instances the preparation of a Transport Assessment may be required and should be discussed with the local planning authority. Further guidance on Transport Assessments is available from the [Department for Transport](#).

8. Recreation

Question	Yes	No
Will the scheme affect any Public Rights of Way? (See note 8a for more information)		
Will the scheme affect access for any recreational users of the river or reservoir banks (e.g. walkers, cyclists, picnickers)? (See note 8b for more information)		
Will the scheme affect access to the river or reservoir for angling? (See note 8c for more information)		
Will the scheme affect fish populations of importance to anglers (See note 8c for more information)		
Is the scheme on an inland waterway that is open to navigation by motorised pleasure craft and managed by a navigation authority? (See note 8d for more information)		
Could the scheme affect navigation through changes in water levels upstream or downstream of the structure? (See note 8e for more information)		
Could the scheme reduce how much water is available for boats passing through locks during low flows? (See note 8f for more information.)		
Could the scheme affect access to and use of the river or reservoir by canoeists? (See note 8g for more information)		
Could the scheme affect a water body used for navigation in any other way? (See note 8h for more information.)		

Notes:

8a: Public Rights of Way are recorded on the Definitive Map of Public Rights of Way, available from the relevant local authority. Development that results in the diversion or stopping up of Public Rights of Way will require a Public Path Order under Section 257 of the Town and County Planning Act 1990. Temporary Public Path Orders may be made for the purposes of temporarily closing or diverting Public Rights of Way.

8b: Information will be available from local authorities, navigation authorities (where applicable) and voluntary groups such as the Ramblers Association.

8c: Information on use of the river for angling will be available from the local Environment Agency Fisheries Officer and from the Angling Trust/local angling clubs. The effect of the scheme on fish populations will need to be assessed to support the application for permits from the Environment Agency.

8d: Inland waterways are navigable channels, rivers and lakes and all associated land (for example towpaths). There is a list of the main inland waterways in England and Wales and their navigation authorities on the Inland Waterways Association website at www.waterways.org.uk/waterways/canals_rivers/a_z_waterways.

8e: Some waterways have water levels that are set in law or by service levels. The navigation authority should be consulted, as early as possible, to see if your scheme could affect water levels.

8f: Some waterways have a public right of navigation, set by law. The navigation authority should be consulted, as early as possible, to see if your scheme could affect this.

8g: Information should be sought from the British Canoe Union.

8h: Permission may be needed from the navigation authority if a scheme affects navigation on a waterway. For example, the location of your turbine could cause unacceptable cross-flow in the navigation channel. The navigation authority should be consulted, as early as possible. Contact should also be made with any local rowing clubs, sailing clubs or craft hire bases, to see if the scheme will affect their interests.

9. Socio-economics

Question	Yes	No
Could the scheme affect commercial aquaculture operations dependent on the river or reservoir (e.g. fish farms)? (see note 9a for more information)		
Could the scheme affect commercial navigation operators (e.g. barges carrying freight or passenger vessels)? (see note 9b for more information)		
Could the scheme affect any other commercial operations (e.g. riverside cafes)?		

Notes:

9a: The Environment Agency will be able to advise on the presence of aquaculture businesses.

9b: The navigation authority should be consulted at an early stage to obtain contact details for operators.

Appendix H: Glossary

Area of Outstanding Natural Beauty (AONB)	An area with statutory national landscape designation, the primary purpose of which is to conserve and enhance natural beauty.
Archimedean Screw Turbine	Archimedean screws have traditionally been used to raise materials, including water, working as a pump. In this configuration a prime mover is required to drive the screw to pump water or convey other materials. In recent years, a different application of the Archimedean screw is becoming popular, where the screw, is run in reverse, by allowing water at a higher level to flow to a lower level through it. This produces power which can be used to drive an electric generator to produce electricity. There are now several installations of Archimedean screw turbines in the UK.
Catchment Abstraction Management Strategy (CAMS)	CAMS are six-year plans detailing how the Environment Agency plans to manage water resources in each river catchment .
Conservation Area	Areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance.
Depleted reach	The section of watercourse between an intake and re-entry of water via the tailrace.
Development Plan	A document setting out the local planning authority's policies and proposals for the development and use of land and buildings in the authority's area.
Environmental Impact Assessment (EIA)	Environmental Impact Assessment (EIA) is required for certain types of proposals before planning permission can be granted. Hydropower schemes with a capacity of over 500kW may require Environmental Impact Assessment
Flood Risk Assessment	An assessment of the likelihood of flooding in a particular area so that development needs and mitigation measures can be carefully considered.
Gigawatt (GW)	Unit of electrical power equalling 1000 megawatts (= 1000 megajoules per second)
Gigawatt hour (GWh)	A measure of quantity of electricity produced or used equivalent to a gigawatt of power expended over an hour, equal to 1,000 megawatt hours.
Green Belt	Land designated around built-up areas to be kept permanently open or largely undeveloped. Green Belts are defined in a local planning authority's development plan.
Habitats Directive	Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive). The Directive created a network of protected areas around the European Union of national and international importance. They are called Natura 2000 sites and include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).
Kaplan turbine	Kaplan Turbines are 'reaction' turbines, with propellers similar in appearance to those on boats and ships (although they turn much more slowly), which run submerged and create pressure differences across their blades to extract energy from the available head. However, these have adjustable blades which can be used to configure the turbine to suit the varying flow available in the river without significant loss of efficiency.
Kilowatt (kW)	Unit of electrical power equalling 1000 watts (= 1000 Joules per second)

Kilowatt hour (kWh)	A measure of quantity of electricity produced or used equivalent to a kilowatt of power expended over an hour.
Listed Building	A building of special architectural or historic interest. Listed Buildings are graded I, II* or II with grade I being the highest.
Local Planning Authority (LPA)	The local authority or council that is empowered by law to exercise planning functions. Often the local borough or district council. National Parks and the Broads authority are also considered to be local planning authorities.
Megawatt (MW)	Unit of electrical power equalling 1000 kilowatts (= 1000 kilojoules per second)
Megawatt hour (MWh)	A measure of quantity of electricity produced or used equivalent to a megawatt of power expended over an hour, equal to 1,000 kilowatt hours.
National Park	The statutory purposes of National Parks are to conserve and enhance their natural beauty, wildlife and cultural heritage and to promote opportunities for public understanding and enjoyment of their special qualities. National parks are designated by Natural England, subject to confirmation by the Secretary of State under the National Parks and Access to the Countryside Act 1949.
National Planning Policy Framework (NPPF)	The NPPF will, once approved, set out central government national planning policies, replacing policies contained within Planning Policy Guidance and Planning Policy Statements.
Parallel tracking	Simultaneously submitting applications for planning permission and Environment Agency permits.
Planning Policy Guidance (PPG)	Issued by central government setting out its national land use policies for England on different areas of planning.
Planning Policy Statement (PPS)	Issued by central government to replace the existing Planning Policy Guidance notes in order to provide greater clarity and to remove from national policy advice on practical implementation, which is better expressed as guidance rather than policy. PPSs will be replaced by the National Planning Policy Framework.
Public Right of Way	A public right of way is a highway over which the public have a right of access along the route.
River Basin Management Plan (RBMP)	Plans, prepared by the Environment Agency, for protecting and improving the water environment.
Terawatt hour (TWh)	A measure of quantity of electricity produced or used equivalent to a terawatt of power expended over an hour, equal to 1,000 gigawatt hours.
Water Framework Directive (WFD)	This Directive aims to protect and enhance the quality of surface water and groundwater bodies by classifying the ecological status of water bodies and monitoring improvement.

Tell us what you think

- Are there any other terms that should be included in the glossary? If so, what are they?