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Dear Water Policy Unit,

CONSULTATION ON THE SEPA GUIDANCE FOR DEVELOPERS OF RUN-OF-RIVER HYDROPOWER SCHEMES

I am responding on behalf of the British Hydropower Association (BHA) to the consultation on the SEPA guidance for developers of run-of-river hydropower schemes.

The BHA is the trade association for the UK hydropower industry. With around 150 members, the Association represents a wide range of interests: consulting engineering, design, manufacture, investment and operation, and specialist service providers. The BHA represents generators from small owner-operators to large UK and international companies.

The BHA believes that charging is generally a good thing as it demonstrates the seriousness of potential developers. However, it is unlikely that SEPA and general legislation would be changed to exclude advertising - If anything the need to advertise will increase. It is important that abstraction and impoundment are both considered. Perhaps SEPA would consider more generally impoundment as "effective impoundment" i.e. even where the weir is greater than 1m, it is effectively less than 1m when considering the burn as a whole. Fees should be reduced where multiple intakes in close proximity to the main burn do not add a significant additional burden to SEPA resources. The subsistence charging regime should not be changed; subsistence charges can be changed much more easily in the future than introducing charges.

We believe that real impact of SEPA's proposed efficiency criteria would be to limit hydro development potential of Scotland and the impact of the efficiency measures they propose is to unfairly discriminated against hydro development when compared to other renewable developers.

The BHA is concerned that by taking the line that until the guidance is finalised, the draft will be applied when it is carrying out its regulatory functions under the Water Environment (Controlled Activities)(Scotland) Regulations 2005, it could be construed that SEPA was not taking the consultation seriously. The Association's responses to the consultation questions are attached.

The Association believes that the 1.75 GWh per annum per 500 m threshold on high status rivers is a strict limit that very few of the schemes currently operating would pass. We believe that the limit, based on a calculation that only considers two points of a complex system based on an arbitrary number for a notional wind turbine, would effectively create no-go zones on high status rivers because very little or more likely no development would take place.

Proposal on sub-100 kilowatt schemes

The BHA proposes a short pilot study on two representative water bodies (as per the examples set out below in the response to question 1) is undertaken to assess SEPA's proposed methodology to ensure that it effectively encourages the efficient use of the water resource – a requirement under the WFD - and if necessary to point the way to a better, fairer and more robust methodology. Our reasoning for the short pilot study is in our response to the consultation questions.

Yours sincerely,

A handwritten signature in black ink that reads "Adrian Abbott". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Adrian Abbott
Policy & Consultations Manager

British Hydropower Association's responses to the Consultation Questions

Part A criteria - sub-100 kilwatt schemes

1. Taking account of the mitigation described in Part B, do you agree that sub-100KW schemes identified as provisionally acceptable according to the criteria described in Part A will not cause deterioration of the water environment?

By the use of Q90 or Q95, depending on site-specific factors, hands off flow is acceptable. Varying the flow downstream of the point of abstraction such that the depleted reach flow increases to Qn80 when the flow upstream of the point of abstraction reaches Qn30 would appear sensible but it may be difficult to achieve in practice however and would be very difficult to verify.

Shutting a scheme down for an agreed period, to provide freshets to the depleted reach, would be easier to manage and would be beyond dispute. A variation might be added such that if Qn exceeds Qn20 at the agreed time/date then the river can be considered to be seeing a freshet naturally and as such no shut down would be required.

Setting maximum abstraction at 1.3 to 1.5 times the average daily flow is acceptable.

The BHA questions whether increasing flows to Qn10 will actually enable fish to ascend the watercourse. We fully accept that the increased flows will trigger the impulse to migrate but would suggest that that trigger will occur regardless of whether the flows are delivered via the watercourse or a combination of the watercourse and hydro facility. It is reported that fish can often not make progress against high flows and need to wait for the receding limb of a spate before progress can be made.

SEPA's proposed approach raises two questions:

- Will the 100kW threshold result in the optimum use of Scotland's water resources?

- What mechanism will be implemented for schemes of capacity 100kW to 500kW to ensure the optimum use of Scotland's water resources?

As set forward, SEPA's guidance will *not* promote the most efficient use of Scotland's water bodies and could lead to the under utilisation of the resource in lowland agricultural areas (the areas where it would have a proportionately larger benefit on the local economy). Under the Water Framework Directive a waterbody with "good" status can have up to 15% of its length failing the "good" standard and tributaries draining up to 25% of its catchment can be "significantly impacted" (i.e also fail the "good" standard) but still retain its status. The following examples of two hypothetical water bodies, both with "good" environmental status illustrate this:

Example A: a small river draining a small, mountainous area of the west-coast

There water body has a good grid-line, a road running right down the middle of the main valley and the tributaries are relatively steep. Only the main stem of the river is on a shallow gradient. Assume every part of this river is suitable for a hydro scheme. Applying SEPA's 100kW threshold and gradient rules would probably knock out a few schemes on the main stem of the river and on some of the shallower tributaries. In this respect the guidance works: by disallowing development on the shallower sections the threshold encourages extra capacity on the steeper sections and tributaries.

However, if the schemes that "pass" SEPA's guidance total more than 25% of the catchment and/or 15% of the main stem length, the threshold does nothing to ensure that the maximum capacity is extracted from the water body while maintaining "good" status. In fact it is conceivable that a few 105kW schemes, if they went in first, could prevent a similar number of 490kW schemes from being developed, reducing the overall generation benefit.

Example B: a small river draining a larger, lowland area of the east coast.

This water body also has grid and road access but has a low gradient, a number of old weirs and its tributaries are also fairly low-gradient. Only some parts of this river system will be suitable for hydro schemes. At a couple of the weirs on the main stem of the river there are >100kW sites but the majority of potential sites are <100kW. In this case applying SEPA's threshold and criteria could easily rule out 80-90% of the schemes in the area. The cumulative impact would be that the few schemes >100kW are unlikely to be approaching the carrying capacity of the river (15% length and 25% catchment).

There is a bias against the local economy if the larger schemes are developed because they tend to be developed by larger developers with the result that much of the financial benefit associated with the resource is siphoned off to remote shareholders. Smaller schemes tend to be developed by the landowners themselves and the profits are directly recycled into the local economy through improved business viability, etc.

Proposal

The BHA proposes a short pilot study on two representative water bodies (as per the examples above) is undertaken to assess SEPA's proposed methodology to ensure that it effectively encourages the efficient use of the water resource – a requirement under the WFD and if necessary to point the way to a better, fairer and more robust methodology.

2. Are there other circumstances under which you think sub-100kW schemes could be developed that will not (cumulatively or individually) pose a risk to the water environment?

Sub-100kW schemes developed on weir installations should pose no risk to the water environment. However, in general the Part B provisions on intake and tail race design, orientation and intake and tail race screening, the provisions on fish passage and on sediment seem very onerous. Many schemes already operate without applying all of these recommendations and without any sign of damage to the water environment.

3. Do you find the checklist format for setting out the criteria for identifying provisionally acceptable sub-100kW schemes helpful? Please make any suggestions you may have for how SEPA could make the information clearer to users.

The BHA agrees that checklists are useful. The number of elements makes it complex.

Part A criteria - 100 kilowatt + schemes

4. Do you agree that the draft criteria on the efficiency of schemes of 100kW or more (in terms of energy output per length of river or stream affected) will help:
- deliver Scottish Ministers' objective of optimising the use of the resource;
- ensure deterioration of status is not caused where there are significantly better environmental options for generating the same quantity of renewable energy?

The BHA believes that Scottish Ministers' statement should not be interpreted in this way. The Ministers statement says that SEPA guidance will be *to facilitate the appropriate siting and authorisation of sub 100 kW schemes*. It refers to *optimising the potential for hydropower generation whilst minimising any adverse impacts on the water environment* not, the resource as interpreted by SEPA and reflected through their proposed 'efficiency' criteria to optimise the use of the resource of a specific site.

There is no reference to the Water Framework Directive (WFD). The WFD criteria requires 'better options' to be technically feasible and not disproportionately expensive. SEPA's proposed 'efficiency' criteria does not take into account the technical feasibility and economic viability of alternatives

SEPA, and ministers, need to consider all the potential impacts of all technologies. We concede that an argument can be made about the smallest schemes, we believe that the threshold is too high, 50kW or less would seem to be more appropriate. The guidance cites a 500kW wind farm as being a 'significantly better alternative' this is not a valid comparator, technologies should not be compared in this way; a 500kW wind turbine, of current design, will deliver 1,095MWh a year and will have an operational life of about 20 years delivering about 21,900 MWh. A 500kW run-of-river small hydro will deliver 1,883.4MWh and have an operational life of 50 years. Over the course of its operational lifetime the hydro project will typically deliver 94,170MWh. Data issued by the Department of Energy and Climate Change show that the energy return over investment in a small hydro project is far in excess of the energy return from a wind farm.

In addition to the energy output SEPA and ministers' should consider the carbon input required to replace the wind farm after its operational life in the total carbon footprint of that scheme. Hydropower is one of best options for generating energy; it is one of the most efficient and benign method available.

The SEPA definition of an efficient hydro does not take into consideration other relevant factors that contribute to the efficiency of a scheme. It cannot simply be equated by a basic generating capacity figure per metre. Other factors include:

- Landownership and water rights;
- Environmental constraints;
- Available grid capacity;
- Technical feasibility;
- Load factors
- Topography and ground conditions of pipe route, intake & powerhouse locations;
- Supply chain; and
- Other water users.

The efficiency of a hydro scheme should be measured against how the available hydrological resource combined with the specific restrictions of the individual scheme.

Part B mitigation measures

5. Do you agree that the mitigation identified will help achieve Scottish Ministers' objective of minimising the adverse impacts of hydropower scheme developments on the water environment?

The BHA believes that in general the mitigation identified has the potential to help achieve Scottish Ministers' objective of minimising the adverse impacts of hydropower scheme developments on the water environment. The requirement on bar spacing for screening is too stringent. A bar spacing of 12.5mm is used on the majority of hydro schemes in Scotland and has been found to be effective where it is not practicable to use COANDA screens.

6. Do you agree that, in general, the mitigation identified is likely to be practicable? If not, please give your reasons for this view.

The BHA believes that the mitigation proposed is not practicable. The cost of employing all of these measures would often be disproportionate and physical space constraints would make it impractical to apply. This especially applies to provisions on the orientation of intakes. In particular:

- Flow variability is very expensive and difficult to engineer for low head sites.
- 10mm intake screening is extremely impractical where abstraction rates for low head schemes.

- There will be a significant number of old mill sites with existing barriers but no practical opportunity (due to space restrictions for example) to install upstream fish passage.
- Physical site restrictions will often make it impossible or impractical to comply with the requirements on intake and tail race orientation etc.
- Only the largest and most profitable schemes could contemplate compliance with the very onerous sediment provisions.

7. Do you think that there other practicable measures that you think could be taken to achieve an equivalent or greater level of mitigation? If yes, please describe the mitigation and your reasons for believing that it would be practicable and effective in minimising adverse impacts on the water environment?

No.