Draft appendix establishing reference conditions and objective setting for heavily modified water bodies to CIS guidance document N°4

Eurelectric comments

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TEMPLATE FOR COMMENTS

Draft Appendix "Establishing Reference Conditions and Objective Setting for Heavily Modified Water Bodies" to CIS Guidance Document No. 4

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4. COMMENTS ON DRAFT GUIDANCE TEXT

Eurelectric welcomes the opportunity to comment on the draft appendix "Establishing Reference Conditions and Objective Setting for Heavily Modified Water Bodies" to CIS Guidance Document No. 4. We thank the Commission and the Ecologic Institute for their work so far and we are looking forward to the discussions to follow on this issue.

We welcome the intention to issue an appendix to CIS Guidance Document No. 4 with the aim to establish Reference Conditions and Objectives for Heavily Modified Water Bodies. Hydropower plants are very often situated in HMWB and planning measures to achieve the GEP is indeed a very complex process for operators.

Before giving our detailed feedback (please find it further below), we would like to address three main key issues:

Hydromorphology

The draft appendix is mainly centered along "hydromorphology", as it clearly and consistently prioritizes hydromorphological elements over BQEs. A strong bias towards hydromorphological elements for classification is visible throughout the document.

In this context, we would like to point out that since the year 2000, measures have been defined by authorities and taken by all affected stakeholders, aiming at improving the status of the water body with respect to the biological quality elements (BQEs). We call into question why this systemic approach using BQEs should now be abandoned, respectively changed in favour of a "hydromorphology-focus".

Eurelectric fully supports the goals of the Water Framework Directive (WFD) and its systemic approach both in the designation of the status/potential of a water body and in the evaluation of measures to reach the respective goals. The core of this systemic approach is – according to the WFD – the focus on Biological Quality Elements (BQE). This should also be reflected in the proposed appendix. Unfortunately, we are currently missing this systemic approach, i.e. the focus on BQE. In fact, the proposed appendix focuses strongly on hydromorphological elements, even though they should only be supporting, and BQEs should constitute the main indicators.

Shortly, the main problem is that the connection between hydromorphology and BQEs is not clear and differs from site to site. In other words, cause-effect-chains between hydromorphology and BQEs are not always existing and therefore rather weak.

Ecological continuum

In the draft appendix, an ecological continuum is seen as a prerequisite to reach a GEP. However, we question this view, as the benefits of an ecological continuum for fish and benthos are both site-specific and species-specific, and therefore not relevant everywhere. For instance, if the reference condition for a waterbody is closer to a lake than a stream habitat, then it would be misleading to make continuity an obligatory criteria. In such a habitat, stream living fish species as salmon and trout have long-since been replaced by lake living species such as perch and pike. A general positive effect of measures to achieve ecological continuum on such populations cannot be expected. Also, the benthos is not often depending on an ecological continuum as most species are quite local and many species have aerial-flight stages with the ability to migrate during this stage.

Therefore, we believe that the ecological continuum is not correctly defined within the draft appendix. The term “ecological continuum” is mentioned 50 times in the document. There is an undue focus on (longitudinal) connectivity and an imbalance in terms of how pressures are addressed in the scope of the document. To sum up, “ecological continuum” should not be obligatory to achieve a good ecological potential (GEP).

Generalizations and missing specifications

Throughout the draft appendix, several generalizations and simplifications have been made. In addition, there is still a lack of clear definitions.

Firstly, we would like to highlight that hydropower plants look differently from country to country and cannot be depicted in idealized schemes. This is due to the fact that they have been tailored to the site specific orographical, geomorphological and hydrological conditions.

Moreover, we would like to stress the fact that we miss a clear definition of the GEP as a reference and a distinguished definition of implementation measures to reach the GEP. The GEP measures library (Excel sheet) makes further judgements necessary by suggesting that a large number of measures has to be “always or usually” implemented. Unfortunately, the table mainly focuses on hydropower and not GEP as a whole, generalizing plant types as well as measures. However, the table implies that that all “++measures” will always (or usually) be necessary to reach GEP.

We doubt the effectiveness of implementing “no-regret-measures” without knowing whether there will be an effect or not. Measures have to be targeted at the specific species and specific deficits at the site (site-specific approach). However, experience shows that this is not the case. A crucial step would also be the identification of an optimal combination of measures.

We rather suggest that the choice of mitigation measures should be based on a sound planning, taking into account deficits and reachable ecological improvements at site (site-specific approach). In this context, it would be possible to refer to the JRC report “Common understanding of using mitigation measures for reaching Good Ecological Potential” instead, as this report already lists a comprehensive set of mitigation measures for all kind of stressors.

Line nr.	Please copy the original text and indicate your proposed change in track change mode	Explanation for proposed change
111 ff	~~The need to achieve intercomparison (intercalibration) of HMWB, which is being supported by the principles put forward in this guidance. For further information on the intercomparison (intercalibration) of HMWB, please refer to section 11 of this document.~~	We suggest to delete this bullet point; As GEP definitions cannot be harmonized (see workshop on significant adverse effects on use or the wider environment from measures, 23- 24 April 2018 – Brussels) an intercalibration is not easily achieved (maybe impossible to achieve). Hence, following strictly the case-by-case approach is the only way to respect the natural and national singularities. It is also noted in the document that there is a wide spread in percentage of WB defined as HMWB (3-50%) in different countries. This both reflect the different prerequisites but also that there is still a large difference in the categorization process resulting in different starting points when discussing what is a major adverse effect on Hydro Power nationwide. This in turn is a starting point for discussing GEP nationwise.in a specific nation.
123-126	GEP is based on deviation from maximum ecological potential (MEP). GEP requires the identification of measures to mitigate the effects of the physical modifications associated with the use so as to improve the overall environmental condition of the water bodies to ensure the best approximation to ecological continuum.	As also described at further parts in this document, the definition of GEP and the implementation of measures to reach GEP shall be distinguished.
123-126	framework for defining GEP does not mean that all water bodies classified as at GEP will necessarily support aquatic ecosystems with an equivalent quality and structure	When discussing about ecological status or potential, the definition from Art 2 should be used. Functioning of ecosystems is mentioned in annex V, but only for physico-chemical quality elements.

212-216	Therefore, hydromorphology is a key aspect of aquatic ecosystems. ~~and in this sense~~ the WFD considers hydromorphological elements as "supporting", together with the physio-chemical ones. However, physico-chemical have also been given a strong role as classifying quality elements from good to moderate status, while hydromorphology classifies only from high to good status. The supporting elements provide the boundary conditions for the biological quality elements, and any alteration in those can translate into a corresponding change of biological conditions at various time scales.	WFD considers biological quality elements as the relevant ones to express the overall status of a surface water body. Hydromorphology is "supporting" e.g. where sufficient data on biological quality elements is not available. The text creates a wrong impression of hydromorphology as a leading indicator for WFD water body status assessment. The role of hymo differs clearly from the role of physico-chemical in WFD. Physico-chemical has been given general classifying role (one-out-all-out in Annex V, 1.4.2). MSs shall define class exact boundaries between high and good as well as between good and moderate status for physico-chemical quality elements (Annex V normative definitons). Hymo classifies only from High to Good Status.
245 - 251	Hydromorphological pressures (e.g. abstractions, damming, etc.) and, considering the water body type, their impacts on the type-specific hydromorphological conditions and the biological quality elements in the water bodies need to be evaluated. A preliminary classification of the ecological status of water bodies is carried out on the basis of the pressures on the different water bodies and the expectation regarding to the risk for BQEs of failing the environmental objectives. This risk assessment requires hydromorphological methods that are able to ~~distinguish between at least high or good and less than good status [of hydromorphological elements] predict the risk of not meeting GES due to hymo.~~ predict the risk of not meeting GES due to hymo.	Risk assessment is not the same procedure as classifying. Assessing of hymo pressure is assessing of risk and in doing that "prudence principle" shall be applied. Classifying shall be made by monitoring the values of BQEs and after that we know, if risk will materialise or not. So, boundaries made for risk assessment cannot be used for actual classification.

275 - 291	*Ecological status* *The WFD considers hydromorphology as a supporting element for biota and ~~as foundation of~~ aquatic* ecosystems. Ecological status is therefore defined in terms of the interaction of all quality elements, even if in WFD Annex V hydromorphological conditions is only explicitly described for the high status. For good and moderate status, hydromorphological conditions are defined as to be consistent with the achievement of values specified for the biological elements; ~~This implies that countries need corresponding class-boundaries for all the obligatory hydromorphological QE as described in Annex V.~~ ~~This means that hydromorphological assessment methods need to be able to assess conditions along the full degradation gradient, from good to bad status (and possibly be sensitive enough to detect changes within the same class, in order to diagnose deterioration). Only then, it is possible to develop a 5-class biological assessment method sensitive to hydromorphological alterations and to forecast the risk of deterioration in case of a new project leading to hydromorphological alterations (see CIS Guidance Document no. 36 on exemptions to the environmental objectives according to Article 4(7)). This also allows not only a better understanding of responses and the possibility to monitor the progresses and efficiency of measures, but also the designation of HMWB, which requires the evaluation of the significance and permanence of modifications and the definition of ecological potential. This is not possible with a single qualitative 2-class method.~~	Interpreting "supporting element" as "foundation" is at most one of several possible ways to interpret the wording of the WFD. It is well established that a good status of biological quality elements is the ultimate aim of the WFD – repeating a differing point of view doesn't make it right. We oppose introducing this interpretation of "supporting element" through an appendix to a CIS Guidance Document.This should be rewritten to be compliant with text in WFD and Guidance document 4. Most of hydromorphology classification methods of MSs are made for classifying hymo pressure. The link between hymo pressure and BQEs varies a lot from WB to WB. Ranking hymo pressure to classes gives additional data for classification, but it cannot be used individually in the same way as physico-chemical class boundaries. It is also very important to emphasize, that WFD requires class boundaries for physico-chemcal quality elements.

294	Conditions consistent with the achievement of the values specified above for the biological quality elements.	A part of the hydromorphology is the hydrology. However it is not the flow variation itself that affects biology and physical processes. It is in some cases the velocities that are dependent but in most cases it is the level variation in time that has the most crucial effect on BQE. There is missing a step to go from flow variation to velocity respectively level variation as this will be radically different in different WB. Than the next step will try to see what these variations will effect BQE. For example velocity variation in a shallow or deep channel will response differently in percentage on a percentage flow change. Furthermore level variations will vary much in timing and amplitude along a river4 dependent on its physical character. The authors should explain if there is always a need to restore longitudinal continuity of the river with transversal barriers? For example, if particular fish species in the part of the "ex natural river" satisfy their needs (for feeding, spawning…) is there a need to have "ex river continuity")?
294	Channel patterns, width and depth variations, flow velocities, substrate conditions and both the structure and condition of the riparian zones correspond totally or nearly totally to undisturbed conditions.	It should be noticed that there is no sense to have variations of width and depth, flow velocities, substrate conditions etc. in, for example, channels of hydropower plants. Are these channels (AWB) in HMWB/AWB identification and designation process compared to specific type of rivers?

327-330	The ecological conditions (ecological potential) of a heavily modified water body have to be assessed with respect to its environmental objective, namely the good ecological potential (GEP). Such is the level that can be achieved assuming that those ecologically effective mitigation measures are put in place, which provide the best approximation to ecological continuum and do not cause a significant impact on use (e.g. loss of power production) or to the wider environment.	According to WFD "best approximation to the ecological continuum" is not a standalone target, but part of process to define MEP and GEP
331ff	The procedure to define GEP starts with the identification of the maximum ecological potential (MEP), which is defined as the ~~conditions occurring when all hydromorphological mitigation measures which do not cause a significant impact on use (or to the wider environment) are assumed to be implemented.~~ the state where "the values of the relevant biological quality elements reflect, as far as possible, those associated with the closest comparable surface water body type, given the physical conditions, which result from the heavily modified characteristics of the body" (WFD Annex V 1.2.5).	We suggest to use the definition according to Annex V 1.2.5
336-340	A hydromorphological prognostic method can be used to evaluate the cumulative effect of measures as well as to identify the hydromorphological conditions at MEP and GEP. If monitoring of BQEs show that the potential is moderate or below, measures have to be put in place to reach GEP. In the design of measures, hydromorphological processes needs to be identified and actions to mitigate the hydromorphological impacts and restore ecological processes have to be planned.	Hydromorphology should only be supporting not deciding as it used in this context. This is quite unclear. Monitoring of BQEs and comparing values of them to natural river or lake shall always be starting point. Defining the values of BQEs of MEP and GEP follows that and in this different kind of models (fish population models, river hydraulic models) and methods (hymo prognosic) may have main roles.

341-348	Mitigation measures should first aim to restore and if not possible to improve quality and connectivity of habitats and enhance movements of energy, material, and organisms (for rivers, this includes flow releases, sediment management, in-channel habitat enhancement, connection to floodplain and side branches, etc.). However, the requirement of WFD to choose the most cost-effective mitigation measures shall be taking into account. As per the definition of GEP, the design of measures and evaluation of effects requires predictive hydromorphological assessment methods to predict the effects of potential measures. These methods need to cover the full degradation gradient with respect to hydromorphology, physico-chemical and biological conditions related to the pressures behind HMWB designation.	As actually described further in this document, Defining GEP and implementation of measures to reach GEP shall be distinguished. Mitigation measures in PoM can be different than those used to define MEP and GEP. WFD calls for cost-efficient mitigation measures and does not exclude any kind of measures (Guidance number 4, Technical report on WFD and Hydromorphological pressures)
368 box	the application of WFD Article 4(7) should ensure that modifications are only made if they are overriding public interest and/or 'sustainable'.	For physical modification also overriding public interest alone can constitute an exemption
371	The application of WFD Article 4(3)(b) also ensures sustainability by assessing whether the beneficial objectives served by the modifications of the HMWB can be achieved by other means, which are a significantly better environmental option.	It should be clearly explained what a “significantly better environmental option” is.

394-396	Taking into account CIS-Guidance no. 4 on HMWB designation, physical modifications due to small scale hydropower (without relatively large water storage dams/impoundments) normally do not fulfill the requirements for HMWB designation (further guidance on this issue is provided in section **Error! Reference source not found.** below).	Large water storage dams/impoundments is not the only criteria for a HMWB designation according to the WFD? HMWB-tool in WFD has been introduced to give MS possibility to safeguard important specific uses for society. Changes in hydro-morphology required by specific uses have changed ecosystems in the way, that good status compared to original water body type cannot be met. However, these changes differ significantly from those of pollution. Normally target for physico-chemical is the same as for natural WBs, even some BQES can meet GES. That's why differ-ent target for HMWBs, GEP, was introduced. Water storage and water regulation (control-ling/changing the natural flow) are the main specific uses linked to hydropower. . Building and operating hydropowerplants has always changed rivers permanently. If this is substantial change or not depends on the change in river ecosystem, not on technical possibilities to change the hydropower scheme. Technically it is possible to unbuilt dams or change water regulation permits of hydropower plants and reservoirs. The easiness of reverse the use of hydropowerplant de-pends on the importance of hydropower to society, not technical possibilities. The flexible use of hydropower plants means changed and fluctuated flows in the river, which has changed and changes morphology (river width and depth). This is sub-stantial change of character (also according to guidance no. 4).

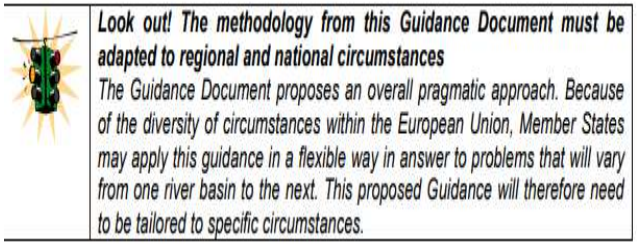
452	It should be noted that a variety of different human activities (multiple use) can can depend on the same physical modification (e.g. a dam that serves energy production, flood protection and irrigation supply in a combined way).	It should be clearly stated that all users have to participate in costs of implementation of measures for achieving GES or GEP, proportional to the their benefits from specific uses.
475 - 476	HMWBs should be water bodies that have undergone significant hydromorphological alterations such that the water body is substantially changed in character (WFD Article 2(9)). The change in character must be extensive/widespread or profound. ~~Typically this should involve substantial change to both the hydrology and morphology of the water body.~~	Requiring a substantial change in hydrology AND morphology is an interpretation not supported by the wording of the WFD.
501 – 506	Assessment of significant negative adverse effect on water use or the wider environment is made in relation to the needs of society and not in relation to the economic situation of the individual. ~~Therefore, the individual operator's ability to pay should not be taken into account. This would benefit, among other things, a company with poor profitability compared with a company with good profitability.~~ Overall business economics are part of the socio-economic assessments. The assessment shall be made by the Member States and can be supported by national targeting strategies.	WFD calls for an assessment of significant effect on specific use. Assessment shall be done also at local level. Assessing the significant effect on individual hydropower plant shall take into account the effect of mitigation measures to that plant compared to existing production and flexibility. So HPP-level assessment does not mean, that economic situation of hydropower company will be taken into account. However, it is up to MS to decide at which level the assessment of significant adverse effects shall be done. WFD text supports levels from local to MS. Arrangements who pays for costs of measures are highly dependent on context (type of use, national conditions in Member State, …). The statement now contained in the text suggests that “the individual operator” (who is that?) should carry the cost of measures. This is an inappropriate assumption.

517 – 519	The methodology and specific criteria for HMWB designation (application of all relevant steps according to CIS HMWB guidance no. 4) should be clearly explained in the RBMPs or supplementary documents. Adding a form/table for each water body containing the information relevant for designation or non-designation as heavily modified is recommended to increase transparency.	Even if general approach is explained in the RBMP the reasons for (non-)designation at the individual water body level can remain unclear. Good practice exists to make all information leading to the designation outcome fully transparent.
544 - 549	The situation is more difficult for water bodies subject to substantial changes in hydrology as such changes may only be temporary, short-term and easily reversible. The water body may have a characteristic which is substantially changed on one occasion (e.g. in case of water abstraction – due to extended low flow situations) but it may look like a normal water body on another occasion (e.g. high flow situation). ~~In cases of temporary substantial hydrological changes, the water body is not to be considered substantially changed in character~~.	The WFD does not support such a generic statement. Assessment of conditions need to be specific to the water body.
561-562	Further examples on how Member States have interpreted this part of the CIS guidance document no.4 in practice would be welcome.	**Document of character of Swedish hydro provided.**
592	Box 1Water body impacted by abstraction without significant ponding/storage … This case usually does not lead to a designation of the water body as heavily modified. It might however be appropriate to define the depleted stretch of the river as a separate water body, which then can be designated as heavily modified.	The figure shows the typical situation for small scale hydro in the Alpine region but in Sweden and Finland the situation is common for large scale and not for small scale. Not acceptable to exclude all abstraction situations from HMWB designation. Other than suggested in the text, such situations are not confined to small hydropower. Abstraction stretches can be several kilometres long and merit definition as their own water body. Should be clarified in the text.

592	Box 1: abstraction: … This case usually does not lead to a designation of the water body as heavily modified. It might however be appropriate to define the depleted stretch of the river as a separate water body, which then can be designated as heavily modified. Add text in red.	Not acceptable to exclude all abstraction situations from HMWB designation. Other than suggested in the text, such situations are not confined to small hydropower. Abstraction stretches can be several kilometres long and merit definition as their own water body. Should be clarified in the text. The box 1 and box 2 are not good implying "natural flow" below run of river plants. This is not true in a regulated river with storage elsewhere. The run of river than just says that the plant follow the regulated flow.
677-682	As shown in the figure below, all main steps under the two approaches are in principle the same. As described in the figure and in the table below, both approaches have exactly the same concept for MEP, i.e. measures are used under both approaches in the same way for MEP. The main difference lies in the derivation of GEP from MEP. In the mitigation measures approach, GEP is derived from the mitigation measures and in the reference approach, GEP is derived from the biological quality element (BQE) values at maximum ecological potential.	Yes, in theory. However, as long as the existing actual values of BQEs in HMWB, are not monitored and predicted values of BQEs followed by mitigation measures calculated, neither of these methods can be implemented in the proper way. WFD Annex V 1.4.1 calls for same kind of 5 classes BQE values for HMWBs as for natural WBs (scale 0-1). Guidance document no. 4 calls for taking into account natural WB inter-calibration in defining, what is slight change between MEP and GEP.
684	Figure 3	The right way would be to give guidance to define the GEP on the base of BQEs. This is not an easy thing to do, as HMWB are profoundly altered by definition. But there are some examples where a semi-quantitative approach was taken (e.g. Austrian guidance on HMWB). Such approaches afford only a semi-quantitative assessment of mitigation measures on the BQEs, which should be possible in most cases.

700	For a final decision, the mitigation measures approach also needs BQE methods sensitive to hydromorphological alterations (for verification of GEP and monitoring of ecological potential), but can preliminary be undertaken without such methods	It should be the biological BQEs that are improved not just a change of HYMO-pressure.
706-707	What are “slight” changes? One of the most crucial aspects for both approaches is a common understanding of “slight changes” in the context of defining GEP. There is still a need to define what means “slight ecological improvement” and how this is linked to selection and exclusion of mitigation measures and the “slight changes” in biological conditions. It has to be ensured that “slight ecological improvement” is coherent with ““slight changes” from MEP for the BQEs (hydromorphological mitigation measures are essential part of assessment method, but not individual target)This aspect is further discussed in the next section of this guidance.	WFD Annex V 1.4.1 calls for same kind of 5 classes BQE values for HMWBs as for natural WBs (scale 0-1). Guidance document no. 4 calls for taking into account natural WB inter-calibration in defining, what is slight change between MEP and GEP. So WFD calls values for BQEs, not hymo.
707ff	This means, in both approaches, derivation or verification of “slight changes” in comparison of MEP and GEP biological conditions and hydromorphological conditions with respect to MEP ~~ensuring best approximation to ecological continuum~~.	In the WFD (Annex 5, 1.2.5; GEP is defined via BQEs)
721-723	The flow-chart integrates the reference approach and the mitigation measure approach for defining GEP, to ensure a comparable outcome for GEP. Both approaches are acceptable, provided there is good knowledge available on the links and interactions between biology and hydromorphology.	But the problem is that the interaction between biology and hydromorphology is not clear and it varies a lot from case to case, For example fish-passage can in some cases improve values fish BQEs significantly, while in quite similar looking case there would be no improvement at all.
743	Fig.4	The figure is not understandable for us

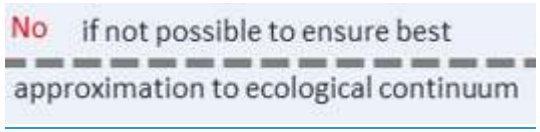
753-755	Figure 1 Process with key steps for defining MEP and GEP. This flow-chart combines both previous approaches for MEP and GEP definition (reference approach follows the thick arrows and mitigation measures approach follows the dotted arrows for GEP definition. The steps for MEP definition are the same in both approaches). -. B) … 1) Selection of technically feasible, biologically effective mitigation measures, which ~~and~~ ensure best approximation to ecological continuum G) … Biological conditions (GEP), considering quality and structure of the ecosystem ~~functioning~~	It is stated that best approximation of ecological continuum is a prerequisite to reach GEP. First of all need for ecological continuum de-pends on HMWB type and reference condition. For example, if reference is lake the ecological continuum is not needed. In WFD classification procedure,"best approximation of ecological continuum" is part of assessment, not stand alone target, with one out all out role in classification. So "best approximation of continuum" is what can be reach with those mitigation measures, that do not have significant adverse effect on use. So taking this additional requirement for ecological continuum to flowchart, will be very confusing and leads to misunderstanding. Further in this document, this requirement of ecological continuum as own target, is explained to mean, that if after classification the river with no water would be classified as GEP, this over ruling can be done. If this is really needed to take to classification, then it can be done by putting a box to document as exemption explaining this message, but not as part this flow chart. WFD art 2: quality and structure of aquatic eco-systems as described in Annex V
774-776	Even for HMWB, the aim is to define objectives ensuring sustainable water use and therefore as good quality and structure of ecosystems as possible ~~functioning aquatic~~, even with significant physical alterations from human activity (WFD Article 1, Article 2, Annex V).	If referred to WFD, the WFD wording should be kept. WFD art 2: quality and structure of aquatic ecosystems as described in Annex V WFD art 1: enhance status of aquatic ecosystems

799 - 801	In a ponded river, the amount (quantity) of flow downstream is the same as the amount of flow upstream (short residence time). ~~In the case of a reservoir, there is a reduction in the amount (quantity) of flow downstream.~~	Also in a reservoir inflows and outflows are the same on average over longer periods of time (except in cases with abstractions or significant evaporation losses). Therefore the meaning of the sentence is unclear; the wording should be modified (or the sentence deleted).
815-818	Overall, it is assumed that water bodies have been properly delineated in line with WFD	According to WFD, a body of water is a significant part of a river. Also natural rivers include different habitats, fast flowing rapids and more lake-like slowly flowing areas. There is no need to delineate these different habitats as individual WBs to be able to classify rivers. This was discussed a lot in developing guidance document 2 and opinions differed significantly. That's why it is stated in the box in the beginning of guidance no. 2,  ***Look out! The methodology from this Guidance Document must be adapted to regional and national circumstances*** *The Guidance Document proposes an overall pragmatic approach. Because of the diversity of circumstances within the European Union, Member States may apply this guidance in a flexible way in answer to problems that will vary from one river basin to the next. This proposed Guidance will therefore need to be tailored to specific circumstances.* So referring to detailed sentences in guidance, which emphasizes, that delineation shall be tailored to MS circumstances, is not relevant.

821ff	).[1] Additional measures to allow the upstream and downstream river sections to achieve their objectives are needed, as ecological continuum (possibility to migrate) also has to be ensured for the type-specific fish species of the downstream and upstream natural water bodies.	Does it means that every dam/transversal barrier should ensure ecological continuum? What in the case if fish species can satisfy their needs (feeding, spawning…) in the part of the river upstream and downstream?
822	5.2.3 B) Identification of mitigation measures (~~**MEP**~~)	Identification of mitigation measures and definition of MEP are completely different tasks if the environmental objective is more than a list of mitigation measures (which in our opinion is the case)
823ff	The mitigation measures for defining values for biological quality elements in MEP should be a selection of technically feasible, biologically effective mitigation measures of relevance, which also ensure the best approximation to ecological continuum and do not have significant adverse effect on use. The box below provides more detailed guidance and interpretation of the aspects related to the best approximation to ecological continuum	List of mitigation measures is not MEP;. The environmental objective must not be a list of mitigation measures but the ecological change those measures are designed to achieve. we doubt that an extensive discussion on "ecological continuum" helps in the development of mitigation measures; continuum is only one aspect; The high priority given to "ecological continuum" throughout the text is not in line with the intention of the WFD, which focusses on a systemic approach using BQEs as indicators of the status / potential.

[1] Workshop on GEP inter-comparison case studies on water storage, 13- 14 February 2017 – Vienna, Summary Report.

827	~~For the definition of MEP, "no-regret" mitigation measures to ensure the best approximation to the ecological continuum need to be selected.~~ GEP is defined by only slight changes in the biological values set for MEP and the hymo conditions have to be consistent with these biological values set for GEP. This means that, for GEP, hymo conditions still have to take into account the ecological continuum requesting migration possibilities, environmental flow as well as sediment/habitat requirements that support slightly reduced specifications of biological criteria mentioned in CIS Guidance Document no. 13 (e.g. species abundance and/or composition) of relevant BQE (particularly fish and benthic invertebrates) compared to MEP.	Ecological continuum for fish and benthos is site- and species specific and therefore not rele-vant everywhere. If the reference of the water-body is a lake habitat instead of a stream habi-tat than you cannot have an obligatory criteria to have continuity. Replacement of stream living fishing like salmon and trout to lake living spe-cies like perch and pike. No biological effect of fishways then. Natural barriers for fish also have to be considered. Also benthos is not always depending ecological continuum since many species have flying stages and can migrate dur-ing that stage. The definition of ecological con-tinuum in the guidance is therefore not properly defined. This shall be clarified: what is meant by "no re-gret". In defining MEP all practicable mitigation measures ex-cept the ones, that cause significant adverse effect on use, shall be considered So there is "regret" also for those measures, which aims to enhance ecological continuum. Actually the best ap-proximation is the one, which takes into account the physical alteration and need to avoid significant adverse effect on use. This is a hypothesis, which quite often will not materialize. Monitoring of HMWB BQEs and comparing these values to natural rivers, has shown, that GEP can in many cases be reached without having all these elements of ecologi-cal continuum in place. It depends on local circumstances, but also on catchment area circumstances. That's why it is important always to assess the predicted change in the values of biological quality elements (BQEs)

832, Figure 6	A. Monitoring HMWB BQEs B. Compare values with reference conditions of original WB type 1 Identify relevant measures 2 Exclude measures that have significant adverse effect on use 3. Select the most ecologically beneficial set of measures… 4. Assess the effect of this set of mitigation measures on BQEs = MEP  [This shall be taken away from flowchart.] If there is need to emphasize, that river with no water cannot meet GEP, it should be put in box as excemption, not to a flowchart as general rule.	Figure 6 and all text linked to that describe only choosing of mitigation measures. Nothing about the assessment of effect on BQEs is included. Firstly, it is not possible to assess effect on BQEs, if the actual values of biological elements are not monitored at all. However, this should be the key in assessment of MEP and GEP. Flow chart shall start with box "monitoring BQEs in HMWB and comparing these values to reference conditions of original water body type". In WFD classification procedure "best approximation of ecological continuum" is part of assessment, not stand alone target, with one out all out role in classification. So "best approximation of continuum" is what can be reach with those mitigation measures, that do not have significant adverse effect on use. So taking this additional requirement for ecological continuum to flowchart, will be very confusing and leads to misunderstanding. Further in this document, this requirement of ecological continuum as own target, is explained to mean, that if after classification the river with no water would be classified as GEP, this over ruling can be done. If this is really needed to take to classification, then it can be done by putting a box to document as exemption explaining this message, but not as part this flow chart. “ecological continuum” still contained in figure 6, steps 3 and 4 – to be changed to “the values of the relevant biological quality elements” (same comment applies to figures 7 and 9)

839	Box 2Check of best approximation to the ecological continuum	Ecological continuum for fish and benthos is site- and species specific and therefore not relevant everywhere. If the reference of the waterbody is a lake habitat instead of a stream habitat than you cannot have an obligatory criteria to have continuity. Replacement of stream living fishing like salmon and trout to lake living species like perch and pike. No biological effect of fishways then. Natural barriers for fish also have to be considered. Also benthos is not always depending ecological continuum since many species have flying stages and can migrate during that stage. The definition of ecological continuum in the guidance is therefore not properly defined.
853 - 854	… For example, ~~in case of dams of more than 50m height~~, it may not be possible to construct a functional fish pass to all kind of dams (eg. due to the height of dam or special tailwater arrangements)	There is no need to set height values of dams in examples. This could be understood as threshold, which is not appropriate. It is important to point out that not at every dam a connection between upper and lower waters can be reached. Propose alternative?
893 ff	Step 4: best approximation to ecological continuum	Requiring “ecological continuum” as a value of its own based on the mention in Annex V of the WFD does not respect the defining role of biological quality elements in rating of water body status. Re-write stressing leading role of biological quality elements in rating of water body status.

893 ff		Both sections refer to each other promising to explain “the need to best approximation to ecological continuum” (line 1784-85), but a convincing explanation is not contained in either section. Remove circular references between section 5.2.3 and section 8.4
898	Nonetheless, it is possible to decide on a generalised level, which mitigation measures are normally expected as being appropriate and without significant adverse effects on use or wider environment and which are not, depending on type if HMWB (e.g. on a generic case level).	Environmental problems need to be observed on a “case by case”. A generalization is misleading because it could be understood that some measures doesn’t have significant adverse effect on use or wider environment.
899-902	If it is not possible to ensure best approximation to ecological continuum with the selected mitigation measures (e.g. there is no water in the aquatic ecosystem at least seasonally), a water body cannot be at MEP or GEP but it should be classified as moderate or worse potential and application of exemptions should be explored. This should be taken out of flowchart. If this is needed, then it could be own box of exemption of MEP and GEP definition after flowchart. Starting with: "In some special cases definition of MEP and GEP can lead to situation, ….	In WFD classification procedure"best approximation of ecological continuum" is part of assessment, not stand alone target, with one out all out role in classification. So "best approximation of continuum" is what can be reach with those mitigation measures, that do not have significant adverse effect on use. It is discussed in workshops and in some documents , that WFD procedure to define GEP, could lead to situation, where GEP is situation where there is a river with no water. This could be confusing and thats why some clarification is needed. However, giving consideration of approximation of ecological continuum own step 4 in flowchart will mislead authorities of MSs, because this can be understood to be minimum criteria, which includes e.g. fishways and e-flows for all kind of HMWBs even though no ecological effect is expected.

920 - 923	The values for the biological and general physico-chemical quality elements at MEP depend on the MEP hydromorphological conditions (pollution is not relevant in this context). ~~MEP hydromorphological conditions thus will primarily dictate the ecological potential of a HMWB.~~	Again an example for the “hymo bias” of the whole document. Hymo is in a supporting role. The biological quality elements determine the overall status of a water body. We oppose changing the intention of the WFD through an annex to a CIS Guidance Document.
1006	In general, a change of type according to physico-chemical conditions is only to be allowed, if the changed physico-chemical conditions are caused by the modified hydromorphological conditions.	What if the pollutants come from agriculture/industry, and the concentrations in impoundment are higher than in a normal lake? Is this change then due to modified hydromorphological conditions? Namely, the emissions are the same but the “capacity” of recipient is changed thru modifications of shape, velocity… (it was a river and now it is a lake)? Who has to take measures to ensure GEP?

1045-1047	Table 7	This is example from MS and shall be taken as such. WFD Annex V normative definition are given only for High, Good and Moderate status or potential. Normative definition are set for values of biological quality elements. WFD is not calling for self-sustainable populations. If WB is designated HMWB, then it cannot meet GES. If reason is fish fauna, then the existing situation + all mitigation measures, = MEP, can only reach moderate status. Normative definition of moderate status for fish fauna in Annex V: composition and abundance of fish species differs moderately from type specific composition, moderate number of type specific fish species can be missing or very low abundance.MEP and GEP are defined by choosing mitigation measures and assessing the effect on BQEs for all individual HMWBs. In theory HMWBs can be grouped. However, this is very difficult, because significant effect on hydropower plant differ almost always as well as the situation for breeding of migratory fish upstream hydropower plant.
1061-1062	Table 1. Member State example of definition of different ecological potential classes for benthic invertebrates in small to medium sized sand-dominated lowland river-HMWBs with land drainage	The multi-metric assessment system used has to be described in a more detailed way to be understandable.
1067	Passability within a water body and access to relevant habitats outside the water body, which are already existing as well as to those which will be restored, is an important factor to achieve and maintain self sustaining fish populations and hence GEP even in the long run.	This means that just in case of article 4.5. of WFD can be considered not to have a fishpass?

1089-1093	The hydromorphological conditions at GEP must be consistent with achievement of the GEP biological values. This can require the identification of the hydromorphological conditions necessary to support the achievement of the GEP values for the biological quality elements, and in particular the achievement of the values for those biological quality elements that are sensitive to hydromorphological alterations.	WFD wording gives a slightly different meaning This can require, but not necessarily. Monitoring of existing BQEs is a key. There are many cases, where existing hydro-morphology enables BQEs for GEP
1096-1103	Overall, the hydromorphological conditions at GEP should consider quality and structure of ecosystem ~~ecological functionality~~ , taking into account the need to ensure best approximation to ecological continuum. As mentioned in section 5.2.3, GEP is defined by only slight changes in the biological values set for MEP and the hymo conditions have to be consistent with these biological values set for GEP. This could mean that, for GEP, hymo conditions still have to take into account the ecological continuum requesting migration possibilities, some flow as well as sediment/habitat requirements	WFD ANNEX V 1.4.1 describes the system for assessing the class boundaries for natural and heavily modified WBs. Scale 0-1 for BQEs and comparing natural iWB intercalibration would give good benchmark. When baseline, actual values for BQEs in HMWB, have been monitored, the assessment could also show, that hydromorphology for GEP is something else, than that made by expert judgement in the beginning of assessment process. So this cannot be decided beforehand.
1134-1135	Figure 7 A. Monitoring HMWB BQEs B. Compare values with reference conditions of original WB type 1 Identify relevant measures 2 Exclude measures that have significant adverse effect on use 3. Select the most ecologically beneficial set of measures… 4. Assess the effect of this set of mitigation measures on BQEs = MEP Remove step 4. and replace it with exemption box after flowchart	Look comment on figure 6. In WFD classification procedure "best approximation of ecological continuum" is part of assessment, not stand alone target, with one out all out role in classification. So "best approximation of continuum" is what can be reach with those mitigation measures that do not have significant adverse effect on use. So taking this additional requirement for ecological continuum to flowchart, will be very confusing and leads to misunderstanding

1136	5.3. Moderate, poor and bad ecological potential	This shall include referring to Annex V 1.4.1. Also HMWBs need class boundaries for BQEs Bad potential 0 MEP 1)
1147 - 1150	~~Furthermore, the importance of ensuring best approximation to ecological continuum is also relevant for the definition of ecological potential in classes less than good. As already noted, if it is not possible to ensure best approximation to ecological continuum, the water body cannot be classified as good ecological potential but only as a class lower than good.~~	Biological quality elements are defining the status class of the ecological potential. Both sentences do not reflect this prioritisation clearly expressed in the WFD and need to be deleted.
1199-1205	1. Mitigation measure is not relevant for the type of water body; hydromorphological alterations or impacts causing failure in achieving good status 2. Mitigation measure is not ecologically effective in the physical context of the water body or water bodies. 3. Mitigation measure is not viable in terms of the required construction or change in practices, taking into account the physical characteristics of the water body. 4. Mitigation measure has significant adverse effects on the use(s) or the wider environment.	The definition of this is still not clarified in section **Error! Reference source not found.**
1212	Box 3 *Examples of generic physical modifications to water body hydromorphology*	What if fish species will lose their orientation in case of a water velocity s < 0.3 m/s?

1223	Box 7, first sentence: “Irrespective of the use for which a particular water body is designated, if an impounding structure has prevented the upstream and downstream movement of fish, some kind of fish pass **may be** required.”	The statement sounds as if in ALL cases a fish pass is required. This is not the case; necessary measures are to be derived following exactly the process outlined in this document. Situations exist where other measures (e.g. changes to operating regime, etc.) are sufficient to meet the objective of GEP (or GES in natural water bodies).

1224-1243	i) Confirm the specific nature of the physical modification (Pressure) ii) Monitor and compare values of biological quality elements to reference conditions of original WB type (classify) ~~ii)~~iii) Understand which hydromorphological supporting elements have been directly or indirectly changed (impacted) as a result of the modification, and how they have been affected (State) ~~iii)~~iv) Consider whether any physico-chemical supporting elements have been adversely affected (either directly by the modification, or indirectly as a result of changes to the hydromorphological character of the water body) (State) ~~iv)~~v) Establish which biological quality elements have been adversely affected and how, (Impact) ~~v)~~vi) Identify the range of typical and modification-specific mitigation measures that may contribute, alone or in-combination, to an improvement in the conditions of the water body (Response) ~~vi)~~vii) Evaluate possible mitigation measures to define MEP and GEP ~~vii)~~viii) Assess values for relevant biological quality elements for MEP and GEP ~~viii)~~ix) Check that the difference between MEP and GEP is compliant with the slight change of intercalibrated natural WBs, 26	The baseline for evaluation of effects on BQEs is missing. It is essential to start by monitoring the values of biological quality elements before assessing the effect of mitigation measures. GEP in WFD is quality and structure of ecosystem as described in Annex V. Ecosystem goods and services are not defined in WFD

1284	~~Table 9~~	Completely remove table 9 We strongly oppose the impression created by this table that only the full removal of dams / flood defences / breakwaters can lead to GES. The measures to achieve GEP listed in the right hand column are often used (and justifiably so!) to achieve GES, not just GEP.

1373	- Oversaturation of nitrogen that may lead to diving disease for fish downstream the tailrace of high-head hydropower plants	This is practically impossible, because if the concentration of nitrogen would be so high, that would lead to mass death of fish in impoundment (upstream of the dam).
1461-1462	**Issue 5**: Define the scale of assessment of significant adverse effects for each key use and the wider environment	WFD does not limit MSs to use specific levels for assessing adverse effect on use in different stages of WFD process
1483	~~Footnote 23:~~	Footnote should be deleted. In this context, economic effects should not include an assessment of affordability or the cost of the measures to the responsible company or organisation. The ability of the user to pay is not relevant at this stage as this would potentially discriminate against efficient and profitable enterprises. Arrangements who pays for costs of measures are highly dependent on context (type of use, national conditions in Member State, …). The statement now contained in the text suggests that "the individual operator" (who is that?) should carry the cost of measures. This is an inappropriate assumption. Also, if the individual operator is implied to carry the cost and his ability to pay is not taken into account this could lead to perverse outcomes. A bankrupt operator won't be able to pay for measures.
1519-1520	For example, an effect should not normally be considered significant, where the effect on the specified use is smaller than the normal short-term variability in performance (e.g.	This is from guidance no. 4, but this cannot be applied for hydro power. Production of flexible hydropower plants varies from hour to hour. For example output from the river Oulujoki can vary from 50 MW to 450 MW in one hour.

1523-1527	~~The distinction between the level of significance and levels of natural variation is important. For instance, how does a level of significance of adverse effect of less than 5% of reduction in annual energy production compare to natural variation in annual energy production of 5-10%? Natural variation implies that, in dry years, a country would have certain energy loss, therefore any reduction to energy production should not be considered automatically as significant adverse effect.~~	Delete whole paragraph. Setting the level of significance at the level of natural variation is arbitrary. In the example in the text, a further loss of 5% energy production in an already dry year could pose significant problems for the energy system. It does not make any sense to argue that the existence of natural variation means that similar additional losses can always be tolerated.
1542	**Water storage and water regulation (for hydropower, drinking water supply, irrigation)**	Water regulation = controlling of water flows is essential part of Hydro power plants operation
1571-1572	Request to ECOSTAT: Further examples from Member States on the question when an adverse effect is considered as significant are welcome.	Method used in Sweden to calculate how much production and regulation capacity can used for mitigation measures without affecting electrical system should be given as example

<table>
<tr>
<td>1575</td>
<td></td>
<td>There is a difference between pumped and storage hydropower plants and run-off-river hydropower plants.

Maybe the following table from “Österreichisher Wasserkatalog: Wasser schützen – Wasser nutzen; Kriterien zur Baurteilung einer nachhaltigen Wasserkraftnutzungs” could be usefull:

Tabelle 10-1: Identifizierte Kriterien und Indikatoren zur energiewirtschaftlichen Beurteilung von Wasserkraftprojekten

<table>
<tr><th rowspan="2">Kriterium</th><th colspan="2">Indikator</th></tr>
<tr><th>Laufkraftanlagen</th><th>(Pump-)Speicherkraftanlagen</th></tr>
<tr><td>Versorgungssicherheit</td><td>• Erzeugungsmenge
• Herstellung Eigenversorgung</td><td>• Erzeugungsmenge</td></tr>
<tr><td>Versorgungsqualität</td><td>• Erzeugungscharakteristik</td><td>• Bereitstellung Spitzenleistung
• Speicheroption
• Pumpspeicherung</td></tr>
<tr><td>Klimaschutz</td><td>• CO_2-Vermeidung</td><td>• CO_2-Vermeidung
• Unterstützung Systemintegration schwankender erneuerbarer Energien</td></tr>
<tr><td>Technische Effizienz</td><td>• Netzanbindung
• Potenzialnutzung
• Ausbaugrad</td><td>• Netzanbindung
• Potenzialnutzung
• Ausbaugrad</td></tr>
</table>
</td>
</tr>
<tr>
<td>1575</td>
<td></td>
<td>The significance should not be set as some general threshold. It would be more useful to describe every “Benefit”. In previous Comment is a table with “Criteria” (“Benefit” = “Criteria”) and in the text of above mentioned Austrian document is explanation of every “Criteria”.

Also, there should be distinction between existing and planned hydropowerplants.</td>
</tr>
</table>

1575		In footnote 29: *A clear definition would be needed: security of supply and/or grid security. Whereas enhancing security of supply aims to decrease energy imports from outside EU, the stable operation of electricity grids aims at providing the commonly known low level of shortages of electricity delivery*. The good status or potential is national obligation, so it should be also national privilege to decrease energy imports from other EU members.
1671-1677	In general, if wider biodiversity interests are to be protected, it is usually considered best practice to avoid adverse effects at source. If this does not completely address the effect, measures might then be taken to minimise any remaining effects to the maximum extent practicable. Thereafter it may still be necessary to offset any residual effects, for example through habitat enhancement or creation elsewhere. Selecting measures in this order is known as the mitigation hierarchy, which is illustrated in section 8.1 further below in this guidance document.	Ecological compensation is that possible in all MS?
1703-1708	In general, if wider biodiversity interests are to be protected, it is usually considered best practice to avoid adverse effects at source. If this does not completely address the effect, measures might then be taken to minimise any remaining effects to the maximum extent practicable. Thereafter it may still be necessary to offset any residual effects, for example through habitat enhancement or creation elsewhere. Selecting measures in this order is known as the mitigation hierarchy, which is illustrated in section 8.1 further below in this guidance document.	Ecological compensation is that possible in all MS?

1719 - 1723	Generally speaking, the assessment of significant adverse effects should be based on the economic effects on a specific sector~~, while the income of a specific company should not be included in this assessment. Whilst significant adverse effects from measures can be linked to a loss of revenue (benefits arising for specific water use), the ability of the user to pay is not relevant at this stage as this would potentially discriminate against efficient and profitable enterprises.~~	Arrangements who pays for costs of measures are highly dependent on context (type of use, national conditions in Member State, …). The statement now contained in the text suggests that "the individual operator" (who is that?) should carry the cost of measures. This is an inappropriate assumption. Also, if the individual operator is implied to carry the cost and his ability to pay is not taken into account this could lead to perverse outcomes. A bankrupt operator won't be able to pay for measures.
1738-1741	Having excluded from the long list of possible mitigation measures, those measures that would have a significant adverse effect on the use or the wider environment, the next step is to take into account the principles of the mitigation hierarchy as well as scale issues (if relevant), to evaluate which measure or combination of measures delivers the best improvement in the values of biological quality elements.	WFD calls enhancing of BQEs, not ecological function. Ecological function shall be used only when describing mitigation measures. When looking at the results of mitigation measures the aim is to enhance values of biological quality elements.
1779-1780	Table 2 Expected improvements to key ecosystem functions from potentially relevant mitigation measure for GEP	The measures for improvements is very generalized and in many cases technique is lacking for large scale hydropower such as screens for downstream migration of fish
1781 – 1794	section 8.4	Delete or re-write the whole section 8.4 to reflect need for best approximation to the values of the relevant biological quality elements (not "ecological continuum")

1819	Fish pass •Restores longitudinal continuity (biota)	It should be clarely defined for which species is fishpass planed, because every species has specific ability to pass or not pass a specifically constructed fishpass (fishladder). It would be usuefull that national copetent authorities in cooperation with scientific community and the operators of hydropowerplants develop national fishpass guidances which would have all informations about fish, habitats, tehnical solutions…
1819	Fish screens •Ensure self-sustaining fish populations	Some explanation is needed.
1819	In-channel habitat improvements	In some types of hydroelectric power plants it is very important that, for exapmple, the derivation channel allows smooth flow of water and it is not advisable to implement measures to improve habitats in such channels.
1819	River morphology changes	In some types of hydroelectric power plants it is very important that, for exapmple, the channel allows smooth flow of water and it is not advisable to implement measures to improve habitats in such channels.
1832	**Step 7. Selection of mitigation measures to achieve GEP** **- add WFD requirement of cost effectiviness of measures in PoMs**	This chapter is missing the requirement of WFD, that measures shall be cost effective.

1850-1854	The most ecologically beneficial (combination of) and cost efficient measures identified in the GEP definition process should be implemented. The benefits of each measure or a combination of measures on values of relevant BQEs should be considered. Measures should be chosen which are most suitable (ecologically beneficial) for mitigating the impacts of specific hydromorphological alterations present at the specific site	The measures needed to implement are the most cost efficient ones, that verify meeting GEP. If classification has been done according to WFD requirements, then class boundaries for BQEs are also available. Even if not, the consideration shall be focused on improving relevant BQEs. The most cost-beneficial measures should also be selected (see also annex 3 of WFD); this aspect should be added to the paragraph.
1880-1883	If no other mitigation option can be identified, it will not be possible to reach GEP conditions and the water body will have to be classified as of moderate potential or lower. Nevertheless, the remaining measures would have to be applied to improve the conditions of the water body as far as possible. An exemption shall be considered in such cases (according to Article 4.5)	So, it is not possible to reach GEP without doing something? What if there are no measures with a significant ecological effect and without severe effects on the business?

5. COMMENTS ON DRAFT TABLES OF MITIGATION MEASURES LIBRARY

[please add rows as appropriate]

It is clear, that we must seek to identify measures to negate, or at least mitigate, the effects anthropogenic alterations. However, according to the WFD we need to take mitigation measures into account only if they are genuinely relevant. The table paints in this regard an unrealistic and simplified picture, in assuming that many if not all mitigation measures contribute “always or usually” to the GEP. Experiences show, that only well elaborated and targeted measures have a significant impact on BQE.

We thus suggest to delete the table and instead to refer to the JRC report “Common understanding of using mitigation measures for reaching Good Ecological Potential”; in the JRC report a comprehensive set of mitigation measures for all stressors is listed.

At least we suggest profound changes concerning the rankings, which in our opinion should be reconsidered. For instance the table ranks “potential” with “++ = always or usually”; but a potential which always occurs, is not a potential but certainty! The table thus implicitly suggest that all ++measures will always (or usually) be necessary to reach GEP.

Additionally the assessment of relevance is often unfounded; For instance many hydropower plants are situated in gravel bed rivers; a relevant impact on macrophytes is not expected there, nevertheless the impact is assessed with “always or usually”. The same is true for phytoplankton: the water residence time in many impoundements is too short to have any measurable impact on Phytoplankton. Even for a paradigm such as “fish passage will improve fish populations”, evidence of the last years is at least contradictionary, moreover comprehensive studies in Germany show no impact of fish passage facilities on fish populations or the ecological status of a water body at all.

In our opinion the choice of mitigation measures should be based on a sound planning taking into account deficits and reachable ecological improvements at the site.

Sheet/table (Rivers or Lakes/Reservoirs or TraC)	Cell reference in Excel (e.g. B15)	Indicate your proposed change (e.g. change from + to ++)	Explanation for proposed change
	All cells	Remove assessment of relevance, only indicate, if the pressure may have an impact;	The actual relevance of an impact is species and site-specific and cannot be deduced on such a broad scale
"responses"	Heading	Connectivity to tributaries is missing as a possible mitigation measure	Spawning habitats and nurseries of many fish species are found in tributaries and not in the main river.

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- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

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- Transparency, ethics, accountability

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