Phil Jones

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Sent: 08 October 2014 02:37
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Subject: RE: EN0100049 Tidal Lagoon Swansea Bay - Deadline 4 Submission by Pontardawe and Swansea Angling Society Ltd

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PASAS Deadline 4 submission re...

Please find attached our Deadline 4 Submissions:

1. Comments on updated AEMP
2. Comments on updated WFD Assessment
3. Response to TLSB comments on our Written Representation
4. Submission requesting protective provision in DCO

Our reference: 10026500

Phil Jones

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TIDAL LAGOON SWANSEA BAY – EN010049

PONTARDAWE AND SWANSEA ANGLING SOCIETY LTD – REF 10026500

DEADLINE 4 COMMENTS ON UPDATED AEMP

1. As we understand it, the purpose of the AEMP is both to:

   a. assess the impacts of the project that remain inadequately determined; and

   b. provide ways of mitigating or offsetting any damaging impacts

   on a continuing basis, with adaptations in response to 'feedback' from the continuing research and monitoring as necessary throughout the lifetime of the project.

2. To assess impacts fully, it's necessary to:

   a. have information about the baseline (pre-construction); and

   b. collect information during and post-construction for comparison with the baseline.

   The AEMP draws a distinction between "surveys" (used to gather information) and "monitoring" (undertaken to validate an assumption or review an effect against a target).

3. The AEMP needs to fully detail the arrangements for:

   a. the gathering of all relevant information pre-construction, during construction and post-construction, including identification of information gaps and how they will be addressed;

   b. the proper assessment of such information to determine impacts as well as risks (resulting from the remaining uncertainties);

   c. the mitigation and/or offsetting of damaging impacts and risks.

4. The DCO needs to include:

   a. provisions to ensure that such arrangements are supervised and approved by appropriate statutory bodies and stakeholder groups;

   b. provisions to protect interested parties against the financial effects of damaging impacts, as identified over both the short and the long term; and

   c. enforcement measures to ensure compliance with such provisions.

5. We aren't satisfied that the updated AEMP submitted at Deadline 3 properly provides for all of the above.

6. Baseline:

   a. The applicant has carried out no baseline characterisation surveys, and has evidently done little research, in respect of salmon and sea trout behaviour in Swansea Bay, such as movements of fish, seasonal changes / distributions, 'mixing' of stocks, foraging behaviour (sea trout), causes of and responses to migratory delays, effects of chemical and physical changes (resulting from the lagoon) on such behaviour, etc.

   b. The TLSB turbine encounter model assumes that Tawe fish make directly for the Tawe and either immediately enter the river or (presumably) stay in the estuary mouth until they enter the river proper. They predict that few fish will encounter the turbines. We dispute this, in part because Tawe Barrage studies (by Mee et al. in the 1990s[1]) showed the majority of fish approaching the barrage, failed to pass it and returned to sea (at least 1km, the range of the detecting equipment), presumably to wait for improved migratory conditions (such as high river flows and adequate dissolved oxygen levels). This 're-approaching behaviour' is consistent with

[1] Mee, DM, Kirkpatrick, AJ and Stonehewer, RO (1996?). Post impoundment fishery investigations on the Tawe Barrage, South Wales

evidence from southwest England (eg. Solomon & Sandbrook, 2004[2]) which demonstrates significant (and damaging) delays to river entry (even in the absence of barrages) especially in dry summer conditions. (By contrast, TLSB relies on poorly-comparable information about salmon 'in-migration' from northern Norway.) Thus if such fish are on the wrong side of the turbine discharges when a spate occurs, it is possible that they may miss an opportunity to run (indeed Solomon and Sandbrook show that delays may mean missing the only 'window of opportunity' for river entry); and if they are delayed by the lagoon operations and/or the Tawe Barrage they may well fall back and 're-approach' the estuary, becoming more likely to encounter the turbines on more than one occasion. None of this appears to have been assessed by TLSB, beyond apparently just comparing fish swimming speeds with lagoon outflow velocities and assuming no-impact avoidance behaviour.

c. An in-depth scientific study of fish movements in Swansea Bay is therefore essential. We have suggested (as did NRW in their response to the draft ES) tagging surveys (as for Mee et al. study of the Tawe Barrage in the 1990s), to try to establish migratory routes (including post-implementation displacement), in-migration and out-migration behaviour, etc, both before and after project implementation. But nothing is proposed by the applicant.

7. Key Issues. The applicant's statement of the "key issue" for salmon and sea trout in para 8.3.0.1. of the AEMP is misconceived:

   a. para 8.3.0.1. actually uses the term "a key issue" but only one issue is discussed – the rate of turbine mortality for fish which encounter the turbines;

   b. much bigger issues, we think, are those set out in our Written Representation:

      i. the rate of turbine encounter, under-stated by the IBM model, we believe;

      ii. massive, unnatural flows in Swansea Bay interfering with normal migration routes and behaviour;

      iii. fish being drawn through the turbines and/or sluices into the impoundment and trapped;

      iv. fish being driven away from the area, and/or detrimentally delayed, by unfavourable conditions.

8. The management objectives set out in para 8.3.0.9. are confused and inadequate for salmon and sea trout:

   a. Objective F1, variously described as "to assess fish passage through the turbines", "turbine encounter predictions", and "evaluation of turbine encounter performance":

      i. In connection with WFD the objective summary says "Fish (migratory fish only) quality element (river waterbodies)". As pointed out in our Written Representation, sea trout are inextricably linked with non-migratory brown trout – they are the same species, *Salmo trutta*. Both migratory and non-migratory parents can produce non-migratory progeny, migratory progeny or a mixture. Any permutation is valid. So any impacts on sea trout in Swansea Bay can affect stocks of non-migratory trout within rivers and therefore the WFD classification of river waterbodies.

      ii. Survey 21, hydro-acoustic monitoring during turbine operation. Frequency, timing and duration of these surveys isn't specified. If they're meant to be continuous, they are apparently limited to one turbine at a time (out of 16). This is claimed to be consistent with "generally accepted fishery sampling principles and practices" but no details are given. For samples to be statistically meaningful, they have to be representative. How is that achieved by sampling one turbine out of 16 when the "sporadic entrainment of fish" referred to could occur through the other 15 turbines? How are interactions with climatic variations – especially sporadic but increasingly frequent summer droughts, which are likely to delay salmonid in-migrations – to be assessed?

      iii. Survey 22, mobile hydroacoustic survey during turbine operation. Said to be intended to focus particularly on salmon, sea trout and herring but only to be undertaken once per month during Feb, March and April. This would be wholly inadequate (the chances of detecting a salmon or sea trout being negligible because of their local population sizes

[2] Solomon, D and Sambrook, H (2004). Effects of hot dry summers on the loss of Atlantic salmon, Salmo salar, from estuaries in South West England. Fisheries Management and Ecology, 2004, 11, 353-363

and the timings), would not be representative, would prove nothing of any statistical value, and would be wholly unsuitable for determining the need for other surveys such as smolt tracking. The methodology proposed appears to be seriously flawed and needs to be justified.

If the timing of the proposed surveys is based on ES Table 9.12 (fish residency and spawning periods), it should be noted that we have disputed that table in para 5.2.2. of our Written Rep[3]. The TLSB Deadline 3 response to our WR[4] is incorrect – the version of the table supplied to us on 3rd July merely corrected presentational errors – we still dispute the content.

iv. Survey 23, netting downstream of flows to "assess fish pass through the turbines" (whatever that means). Frequency, timing and duration of these surveys isn't specified. What is the purpose? What is it expected to show? Especially if conducted outside the lagoon on an ebb tide…

v. If the rod-catch rate for salmon and sewin is (as generally accepted) about 15%, the numbers of fish ('runs') that we are concerned with are modest:

(a). Tawe – about 980 salmon and about 1,486 sea trout (average catches 2004-13 of 147 and 223 respectively);

(b). Neath – about 440 salmon and 2,940 sea trout (ave catches 66 and 441);

(c). Afan – about 66 salmon and 840 sea trout (ave catches 10 and 126).

The surveys proposed are hardly likely to detect impacts on such low numbers of fish.

vi. NRW need to comment on these proposals.

b. Objective F5, "review migratory fish stocks along the Afan and Tawe":

i. The same point applies here as with Objective F1 above. Non-migratory trout should not be discounted.

ii. Why is the River Neath excluded?

iii. The recently-installed video camera on the River Afan fish pass is capable of producing valuable data.

iv. The proposed improvements to the Panteg fish pass / trap are welcomed but the value of the data it might provide should not be over-stated. Panteg Weir is about 11 miles up river, above some tributaries used for spawning, and fish caught in the trap might not be representative of the river's migratory fish population.

v. Of much more value would be fish counter data from below the Tawe Barrage and above it – perhaps at the Beaufort Weir in Morriston (just above the tidal limit). We have suggested this to TLSB. Technology improvements seem now to make this a viable proposition.

vi. Monitoring should last the lifetime of the project and should not be limited to 15 years. The lagoon could have irregular effects, especially combined with climatic and other variations.

c. Objective F6, "Analyse rod catch data to determine effect of the Lagoon":

i. The same point applies here as with Objective F1 above. Non-migratory trout should not be discounted.

ii. The use of catch statistics to show cause and effect is fraught with difficulty and TLSB would inevitably exploit this difficulty, if numbers declined.

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[3] "Table 9.12 shows migration and spawning periods for salmon and sea trout. We don't accept the accuracy of this table: fresh salmon enter the river as late as December or even January; spawning is unlikely to start as early as September for either salmon or sea trout; smolts probably leave the system most months of the year – certainly into June – and departure is also delayed by the Tawe Barrage."

[4] "A revised table was sent to PASAS on (1 July 204). TLSB acknowledged that this was a generic UK description and that regional differences may occur but advised, based upon the views of its expert technical adviser, this would not affect impact assessments."

iii. It would not be sufficient to compare the Swansea Bay rivers with just one reference river – a suitable river would be difficult to identify and any one reference river might be subject to factors which would distort the comparison – eg:

(a). the most likely candidate to the east, the Ogmore, is subject to pollution events, has been heavily stocked in recent years and has been subject to illegal netting;

(b). the next river west, the Loughor, is of a different character, meandering for miles through a flood plain;

(c). further west, the Tywi is a bigger river, has a dam on its headwaters, flow is heavily controlled, there's licensed netting in its estuary and there has been heavy (some would say indiscriminate) stocking with salmon and sea trout in recent years.

It would be better to identify a number of reference rivers. Trends in different rivers over time are remarkably similar, when charted.

iv. Although we were misquoted by TLSB during their oral representations on 18th June, the level of fishing for salmon and sea trout could in future be affected by:

(a). likely changes in catch and release requirements (possibly leading to a reduction in licence purchases, fishing effort and catch returns);

(b). possible changes in rod licence structures following the separation of NRW from the Environment Agency (possibly leading to an increase in licence uptake if one possible scenario, an all-species licence, is pursued).

9. Mitigation / offset. Although they have discussed possible measures with us, no mitigation / offset measures are proposed by the applicant in the AEMP. These are an essential part of the EIA, and should have been spelled out (including with feasibility assessments) long ago. Even AFD, already proposed in the ES, appears no longer to be favoured, unless absolutely necessary.

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DEADLINE 4 COMMENTS ON UPDATED WFD ASSESSMENT

WATERBODY ERRORS.

1. Table 3.1 lists the waterbodies assessed and includes
   a. GB541005900900 "*Tawe Estuary*"
   b. GB110059032180 "*River Tawe – confluence with Twrch to tidal limit*".
2. As explained in our Written Representation submitted at Deadline 2, Waterbody GB541005900900 described as "*Tawe Estuary*" doesn't actually extend above the Tawe Barrage. It doesn't include the Tawe estuary between the Tawe Barrage and the highest point reached by tides at the Beaufort Weir in Morriston – about 3.5 miles of water with water quality issues caused by the Tawe Barrage.

   Unfortunately NRW (or rather, Environment Agency Wales before them) have failed to give this stretch of the Tawe estuary a WFD waterbody identifier or to include it in any other waterbody. NRW have told us that:
   a. during the current WFD cycle (2009-2015) they have treated it for practical purposes (monitoring and recording) as part of existing waterbody GB110059032180 (Tawe – confluence with Twrch to tidal limit);
   b. for the next WFD cycle (2016-2021) they propose to regularise its incorporation in that waterbody GB110059032180.
3. Appendix 1 shows the location of the waterbodies assessed and Figure B in that Appendix "*WFD Waterbodies – Transitional (Estuarine) Neath and Tawe*" on page 165 includes the following note:

   "*Note: The image of the Tawe Estuary transitional water body was obtained from the Environment Agency website*

   http://maps.environmentagency.gov.uk/wiyby/wiybyController?x=357683&y=355134&scale=1&layerGroups=default&ep=map&textonly=off&lang=_e&topic=wfd_estuaries#x=267395&y=192766&lg=1,5,6,7,&scale=8

   which is the link provided from the Annex B of the Western Wales River Basin Management Plan (Environment Agency, 2009a) and is for illustration purposes. The extent of the water body has been considered to cover the area upstream to the WFD river bodies that adjoin the water body (i.e. Tawe - conf with Nant Cwmgelli to tidal limit GB110059025690; Nant y Fendrod – headwaters to conf with Tawe GB110059025710; and Tawe – confluence with Twrch to tidal limit GB110059032180)." (our underlining).
4. When TLSB say, therefore, that "*The extent of the [Tawe estuary] water body has been considered to cover the area upstream to the WFD river bodies that adjoin the water body (i.e. Tawe - conf with Nant Cwmgelli to tidal limit GB110059025690; Nant y Fendrod – headwaters to conf with Tawe GB110059025710; and Tawe – confluence with Twrch to tidal limit GB110059032180)*", they have gone against NRW current practice and stated intention.

   This is significant, because:
   a. GB541005900900 "*Tawe Estuary*" is a transitional waterbody; but
   b. GB110059032180 "*River Tawe – confluence with Twrch to tidal limit*" is a river waterbody.
5. Table 3.12, which forms part of the assessment of the Tawe Estuary, lists the upstream waterbodies which might be affected by impacts on fish. The table is full of errors:
   a. Waterbody IDs and names are repeated and wrongly described.

b. GB110059032180 appears three times, twice described wrongly as "*Nant Du*" and once wrongly as "*Nant Llech*". It's actually the main river waterbody "*Tawe – Twrch to tidal limit*".

ASSESSMENTS

6. Table 3.2 lists the "*Relationship of the Project components with relevant WFD waterbodies*", and identifies the waterbodies (including rivers upstream) likely to be affected by the various "components" of the project, eg: potential entrainment of migratory fish during operation, suspension of sediments and contaminants during construction.

7. Potential impacts on River Tawe waterbodies are then assessed in the "*Tawe Estuary*" section starting at para 3.6.3:

   a. Effects of flows and turbine encounters on salmon and sea trout.

      As explained in our other submissions, we don't accept the applicant's conclusions as to the likely effects. If the ExA accepts our arguments that the applicant's confidence in its predictions is misplaced, then these WFD assessments have to be rejected.

   b. Suspended sediments and contaminants.

      As explained in our Written Representation, we believe it likely that sediments and contaminants suspended by construction activities will be swept by flooding tides into the Tawe estuary – not just the "*Tawe Estuary*" transitional waterbody but also the lower reaches of the river waterbody GB110059032180 which extends down to the Tawe Barrage. We don't accept the applicant's assessment.

      The Tawe estuary between the Tawe Barrage and Morriston already suffers from water quality problems, caused the barrage[1]. In particular there is stratification of saline and freshwater layers, which causes de-oxygenation of the saline layer, which is potentially threatening to emigrating salmon and sea trout smolts. Remedial measures have been needed to protect them. Transport into the estuary of suspended sediments and contaminants could exacerbate this situation.

      On ebbing tides any suspended sediments and contaminants which have not settled out in the estuary will be swept back out again, potentially discouraging returning adults (which are already reluctant to pass the barrage) from entering the river.

   c. Dissolved inorganic nitrogen.

      Table 3.2. and the Tawe Estuary assessment beginning at para 3.6.3. fail to mention the effects on fish of the dissolved inorganic nitrogen problems described in the "physico-chemical elements" section beginning at para 3.6.3.58.

      As we understand it, simply put, dissolved inorganic nitrogen promotes algal blooms, some of which can be toxic to fish and humans, the decomposition of which causes low levels of dissolved oxygen, harmful to fish.

      Dissolved oxygen implications for fish are not discussed in the section beginning at para 3.6.3.78.

   d. We submit that the implications for fish in waterbodies GB541005900900 "*Tawe Estuary*" and GB110059032180 "*River Tawe – confluence with Twrch to tidal limit*", which extends down to the Tawe Barrage, have not been properly assessed.

      The potential effects on chemical status of the "*Tawe Estuary*" water body are considered serious enough to warrant Article 4.7. consideration. That doesn't take care of the implications for the fish element of the classification of the River Tawe waterbody

[1] Evans, DM and Rogers, AP (1995?), The effect of the Tawe Barrage on estuarine water quality.

GB110059032180 “*River Tawe – confluence with Twrch to tidal limit*”

8. We submit that the updated WFD assessments is still defective.

TIDAL LAGOON SWANSEA BAY – EN010049

PONTARDAWE AND SWANSEA ANGLING SOCIETY LTD – REF 10026500

DEADLINE 4 SUBMISSION SEEKING INCLUSION OF PROTECTIVE PROVISION IN THE DCO

1. In para 7.3.2. of our Written Representation, submitted at Deadline 2, we asked the Examining Authority, if the DCO application is recommended for approval, to ensure that secure measures for our protection are included in the Development Consent Order, including:

   a. requirements to implement any mitigation and offsetting measures devised as a result of discussions between the applicant, NRW, ourselves and other interested parties

   b. proper monitoring, at the applicant's expense, of the effects of the construction, operation and maintenance of the project

   c. offsetting measures to counter an assumed level of harm (as in the case of the Cardiff Bay Barrage), whether or not demonstrated by monitoring, because of the possibility that monitoring might not identify true impacts

   d. compensation arrangements to take effect if monitoring shows that fish and therefore our fishery have been harmed

   e. requirements to remedy any damaging effects of the project

   f. security (eg in the form of a bond) to cover any liabilities which the developer, or any other entity to which responsibility is transferred, fails to honour.

2. Four of these items – a, b, c and e – will hopefully be provided for in the AEMP, the delivery of which will hopefully be secured in the DCO. We've made a separate submission about the AEMP.

3. It was apparent from the issue specific hearings that you have the last item f. – security for liabilities – under consideration.

4. In this submission we ask you to include the following provision in the DCO for the protection of the owners of fishing rights in affected rivers. We have discussed this in general terms with the applicant and they appeared receptive in principle but haven't actually drafted anything for us so we submit our own draft.

   This draft is not based on legal advice and we expect to refine it in discussions with the applicant.

5. We were in a similar position when the Tawe Barrage was being proposed in the 1980s. That was promoted via a Private Bill in Parliament which, when passed, became the Swansea City Council (Tawe Barrage) Act 1986. Parliamentary Counsel, acting for the (then) City Council drafted the following provision for us, which became section 36 in the Act.

   "*For protection of fisheries*

   36. For the protection of owners of proprietary rights of fishing in the non-tidal waters of the River Tawe, but not otherwise, the provisions of section 92 of Schedule 3 to the Water Act 1945 are hereby incorporated with this Act and, as so incorporated, shall have effect as if –

   (a) for references to the owners and occupiers of, and all other persons interested in, any lands or streams taken or used for the purposes of the special Act or injuriously affected, there were substituted references to the owners of proprietary rights of fishing in streams injuriously affected;

   (b) references to the undertakers were to the Council."

The Water Act 1945 provision read:

> "*Liability of undertakers to pay compensation*
>
> *92. In any case where no express provision with respect to compensation is made by the special Act, the undertakers shall pay to the owners and occupiers of, and all other persons interested in, any lands or streams taken or used for the purposes of that Act, or injuriously affected by the construction or maintenance of the works thereby authorised or otherwise by the execution of the powers thereby conferred, compensation for the value of lands or streams so taken or used and for all damage sustained by those owners, occupiers and other persons by reason of the exercise as to those lands and streams of the powers conferred on the undertakers by the special Act, or any Act incorporated therewith.*
>
> *The amount of such compensation shall, in the case of dispute, be settled in manner provided by the Land Clauses Acts with reference to the taking of lands otherwise than by agreement.*"

6. We ask for similar protection to be included in the DCO in this case. We have re-drafted the "Tawe Barrage Act" provision for inclusion in Schedule 7.

> "*For protection of fisheries*
>
> *The undertaker shall pay to the owners and occupiers of, and all other persons interested in, proprietary rights of fishing in streams injuriously affected by the construction, operation or maintenance of the authorised development, or otherwise by the exercise of powers conferred on the undertaker by this Order, compensation for all damage sustained by those owners, occupiers and other persons by reason of the exercise of the powers conferred on the undertakers.*
>
> *The amount of such compensation shall, in the case of dispute, be settled by … [to be determined …]*"

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DEADLINE 4 RESPONSE TO TLSB DEADLINE 3 COMMENTS ON OUR DEADLINE 2 WRITTEN REPRESENTATION

1. We don't propose to respond point by point to TLSB's comments on our representations about modelling. The ExA has to decide whether it accepts TLSB's confidence in its predictions or whether it accepts our arguments that such confidence is misplaced.

   We stand by all our submissions and we approve of the applicant's reference in its "Accuracy and Limitations" document to "a clear distinction between precision and accuracy" and the "potential false impression of accuracy due to precision".

2. We wish, however, to clarify some points in TLSB's responses to our Written Representation:

   a. Para 5.2.2.

      The revised table 9.12 sent to us on 1st July was still wrong – it included presentational errors, as well as in the legend. When we pointed this out, a further revised table was supplied on 3rd July. This eliminated the presentational errors but we still disagreed with the content, as explained in our written representation. The TLSB response doesn't address this.

   b. Para 5.2.3.

      TLSB response para 1. has a typo (missing quotation marks) and should read:

      > *The text within the ES "**Inter-annual variation in salmon and trout numbers according to rod catch data is evident, however broad scale estimates of fish numbers seem to indicate fairly stable populations. It should be noted that populations across the UK are in decline**", was from the Environment Agency, 2011a.*

      We were making the point in paras 5.2.3. to 5.2.6. that we had more recent (2013) information from NRW (which we supplied), showing that the applicant's statement in the ES was no longer correct. So we dispute the claim in TLSB's response that

      > *"As such, it is the view of THA that this statement, supported by data from regulators is an accurate representation of the current situation."*

   c. Para 5.2.4.

      In para 1. of its response TLSB now seems to be accepting, on the basis of an online news report, that we were right after all. We had actually supplied much better evidence to support our claim than the newspaper report – NRW documents detailing the decline.

      In para 2 of its response TLSB misquotes / misinterprets something we said in a (without prejudice) meeting. In the context of the applicant's suggestion that rod catches be used as the main measure of the effects of the lagoon we said that, now that NRW have identified declines and are pressing very hard for voluntary catch and release (and might introduce mandatory catch and release), there is likely to be an effect on fishing effort in future. Anglers are less likely to pay £72 for a salmon and sea trout rod licence, if they have to release any fish caught. We aren't suggesting, and don't accept, that it's a reason for reduced catches since 2010, which have triggered urgent action by NRW to stop the killing of salmon and sea trout.

   d. Paras 5.2.5. and 5.2.6.

      TLSB's remarks are mistaken, as explained above.

   e. Paras 5.3.2. and 5.3.3.

      We accept that our comparison of flows through the turbines (of 6,000 cumecs) with river flows of 200 cumecs wasn't realistic because we didn't allow for the differences in the channels – the

turbine array is much wider and deeper than the river channel. It would be better to compare flow speeds.

We have asked for, and TLSB have promised, more detailed information about flow speeds and “draw zones” at various states of the tide and at various distances from the turbines (than is provided in Figures 6.33, 6.34, 6.38 and 6.39) but it hasn’t been received yet.