Review of Hawkins Report

Introduction

The main contention, from a regulatory perspective, of the report by Professor Anthony Hawkins ("the Hawkins Report") is that the Section 36 ('s.36') consent and Appropriate Assessment ('AA') completed in respect of Aberdeen Offshore Wind Farm Ltd's ('AOWFL') (otherwise referred to as Vattenfall) applications to the Scottish Ministers to construct and operate the European Offshore Wind Deployment Centre ('EOWDC') (sometimes referred to as Aberdeen Bay Offshore Wind Farm) are based on a 'flawed' Environmental Statement (including the Supplementary Environmental Information Statement otherwise referred to as the Addendum and all collectively hereinafter referred to as the 'ES'). This is largely based on the claim that the impacts of noise and Electromagnetic Fields ('EMF') on salmon and sea trout were not fully assessed. These aspects are addressed in the summary by Marine Scotland Science ('MSS') and the reviews undertaken by Vattenfall, CH2M, Scottish Natural Heritage ('SNH') and Nathan Merchant of the Centre for Environment Fisheries and Aquaculture Science ('CEFAS').

Independent Reviews

1. **Review of the Hawkins Report by Vattenfall ('the Vattenfall Report')**

The Vattenfall Report is restricted only to the issues raised regarding EMF and the Cable Laying Strategy ('CLS') and concludes the following:-

In conclusion, the main objections relating to the potential issues arising from EMF in the Hawkins' report is that the AOWF (otherwise EOWDC) *ES did not assess the impacts of EMF sufficiently, and that the knowledge on the potential impacts arising from EMF is too poor to make appropriate decisions. The concerns leading to these objections can be shown to be unfounded, due to two principal reasons:*

- *Recent studies by Marine Scotland Science (Armstrong et al., 2015) observed no significant changes in swimming behaviour of salmon exposed to EMF in excess of those predicted to result in the cables from the AOWF* (otherwise EOWDC)*, and concluded that salmon are unlikely to be 'seriously' adversely affected by B fields.*
- *Modelling presented within Armstrong et al., 2015 shows the predicted field strength of the buried cable at 1m depth are within the background level of the earth's magnetic field. These fields would therefore not be likely to be detected by salmon or sea trout.*

The main issues presented within the Hawkins' report with respect to the CLS appear to have arisen due to a misunderstanding in the commencement of offshore construction, thus when this CLS report should be submitted and who should be consulted upon with regards to its content.

- *The CLS was submitted in January 2017 and contained the information specified within the licence condition, and sent out for consultation by Marine Scotland to relevant consultees as deemed appropriate by Scottish Ministers.*
- *The location of the cable corridor is already consented and consultation on this took place at the EIA stage. Fishermen will be informed of construction works through the mitigation measures prescribed in the Licence conditions* and the construction method statement, which includes Notice to Mariners.
- *According to the Dynamic Coast project online tool, the coastline at Blackdog is undergoing accretion rather than erosion, and the cable landfall has been designed to minimise risk of re-exposure. A programme of beach topographic surveys works has been undertaken over six years in order to investigate seasonal trends in beach topography. With the preferred option for HDD cables estimated to be 12-14 m below ground level. In the unlikely event that the cable did become exposed, AOWFL have committed to re-bury any cable re-exposed by erosion (as described in Section 9 of the CLS).*

Note:- Since the writing of the Vattenfall Report the HDD option has been removed and Vattenfall are now proposing to carry out duct installation by trenching. Indicative target burial depth will now be 1.5 metres not 12-14 metres. Vattenfall intend to achieve a minimum depth of 1 metre and have remote condition monitoring using temperature sensing (DTS) to identify cable exposure or any breakages. If the cable becomes exposed Vattenfall will make reasonable endeavours to re-bury the cable.

2. The Nathan Merchant, CEFAS Review ("the Merchant Report")

The Merchant Report specifically addresses the criticisms raised in the Loughine report (otherwise known as the Hawkins Report) in relation to the assessment of underwater noise and its potential effects on salmon (*Salmo salar*) and sea trout (*Salmo trutta*) in the environmental impact assessment (EIA) carried out for EOWDC in 2011. These criticisms are detailed on pp56-60 of the Hawkins Report. The Merchant Report concludes the following:-

The use of suction bucket foundations is expected to substantially reduce the acoustic impact of the construction operation compared to impact pile driving. It is therefore appropriate that impact pile driving was considered as a worst case with regard to construction noise in the EIA. Although the effects of the particle motion component of sound were not explicitly assessed in the EIA (only sound pressure was considered), this remains the norm at present since measurement standards, instrumentation, and noise exposure criteria for particle motion are lacking. The best available noise exposure criteria for fish (Popper criteria; published after the EIA was completed) also provide thresholds based on sound pressure rather than particle motion. The Loughine report (otherwise Hawkins Report) *identifies deficiencies in the noise exposure criteria and the sound propagation modelling used in the EIA, which we consider to be valid criticisms. However, it is our view that addressing these shortcomings would not increase the predicted level of risk, due to the comparably low levels of construction noise now expected due to the use of suction bucket foundations. The risk of impact from operational noise and infrasound were expected*

to be negligible, based on published field studies of operational wind turbine noise and consideration of shallow water acoustic propagation, respectively.

In summary, with reference to the scientific literature and through consideration of current best practice for EIA of underwater noise, it is our view that an EIA conducted according to current best practice would not identify a higher level of risk than the original EIA completed in 2011. This is primarily due to the use of suction buckets for the wind turbine foundations, rather than impact pile driving, as was assessed in the EIA.

3. The CH2M review ("the CH2M Report")

CH2M were commissioned by Marine Scotland – Licensing Operations Team (MS-LOT) to review the Hawkins Report. The CH2M Report concludes the following:-

The Hawkins Report has been reviewed with the specific points crossed referenced with the output of the EOWDC's consenting material. The suggestions made in the Hawkins Report on how these points can be addressed have been reviewed and the implications for the consent documents outlined.

This review found the majority of points raised in the Hawkins Report have been addressed previously in the consenting documents. The technical points raised in relation to EMF, suspended sediments, cumulative impacts and potential monitoring and research opportunities were noteworthy but have been considered directly through the EIA process or indirectly through the application of a worst-case scenario. The only technical issue that appears not to have received appropriate treatment is the consideration of operational noise impacts on salmonids. Research outputs have been applied to the assessment without evaluation of the caveats placed on this research by its authors. This review notes that this observation would not necessarily change the conclusions of the assessment but provide a route to validate the quoted research or perhaps develop alternative mitigation strategies.

4. Comments by SNH

SNH provided specific comments on the Hawkins Report which include the following:-

The Hawkins Report

The report reviews information relating to the consent including the application and supporting environmental information. It is assumed that the author has had access to all relevant publically available material.

The report raises concerns regarding the assessment process and impacts to Atlantic salmon and sea trout as well as raising queries on the process since consent, in particular whether the conditions laid out in the consent are in place and what, if any, additional assessment has been carried out due to changes in foundation construction. The report also queries the consultation process – on this aspect SNH offers no comment as this is outwith our remit.

Environmental Assessment

- *Consideration of Impacts*

SNH has considered the impacts through noise and EMF to mainly diadromous fish interests (Atlantic salmon, trout (and by association freshwater pearl mussels), river and sea lampreys) as well as the European eel. We did not consider the impacts to marine fish species as this falls within the remit of MSS.
Our assessment considered the impact pathways of underwater noise – largely through the construction phase for piling noise for the as then proposed piled foundations. We also considered operational noise impacts; provided advice on the impacts from raised sedimentation levels during construction, and we also considered the impacts associated with Electro-Magnetic Fields (EMF) from the inter-array cables and also the export cables to shore.

The report raises a number of issues to which we provide further advice and/or commentary:

I. The need for avoidance of impacts to spring running adult salmon is raised, (we considered all run types of Atlantic salmon) – and advised that significant adverse impacts can be avoided through the timing of construction work as well as construction methods.
II. The construction and operation of the wind farm may lead to an additional risk of predation – it is not considered likely that there will be any increase in risk of predation as the duration of construction is relatively short and no obstruction from the construction and operation of the wind farm will occur from this project to any of the natal rivers.
III. Effect on migratory cues – very little is known about the migratory cues and it is not considered likely that the construction and operation of this wind farm will have a significant adverse effect on such migratory cues. MSS is currently undertaking tagging and other research work which will help inform our understanding of Atlantic salmon movements and migration.
IV. All aspects of construction and operation activities are required to have in place pollution contingency plans and these have to be consulted upon, it is therefore unlikely that there will be any major effects from any accidental pollution issues.
V. The consideration of underwater noise is an area that was fully considered by SNH. The more recent change from piled foundations to that of suction bucket foundations has also been fully assessed and impacts were judged to be acceptable and would not have an adverse significant impact.
VI. We advised on the requirement for the burial of cables to reduce the effects of EMF. The cable laying strategy indicates that burial of cables to the recommended depth is planned.

Conditions

The key conditions requested by SNH in respect of fish interests are either no longer required due to the changes from piled foundations to the use of suction buckets, or are still required and are in the process of being discharged. These include:

- *The burial of cables to reduce the effects of EMF;*
- *The production of a project environmental management plan (PEMP);*
- *Consideration and implementation of pollution prevention measures;*
- *The production of a vessel management plan; and*
- *The production of a cable laying strategy for the export cables.*

SNH comments conclude with the following:-

In considering the issues raised in this report we do not consider that anything further requires to be addressed, accepting that knowledge gaps remain in some aspects of fish behaviour and ecology. The development of this wind farm in this location is not considered to have significant adverse effects and any research/monitoring carried out as part of the wind farm development will assist in our understanding for future developments whether renewables related or not.

5. Marine Scotland Science Summary ('MSS Summary')

MSS have endorsed all four of the above reviews as providing valuable information and provided the following additional comments:

i) Comments by SNH
This provides a clear statement on the advice SNH provided during consultation on the application, including relevant highlights from their consideration of impacts. It also provides some further advice and/or commentary in response to the Loughine Report, outlines requested conditions and comments on on-going research and research opportunities. It accepts that knowledge gaps remain in some aspects of fish behaviour and ecology.

ii) The Vattenfall Report
This includes a useful summary list of topics included in the Loughine Report. It provides useful information on sediment dynamics at Blackdog. It also includes a response to issues identified relating to EMF and concludes that such fields would not be likely to be detected by salmon or sea trout, as predicted EMF field strengths at the seabed surface above buried cables are less than those found to not result in overt changes in behaviour by Armstrong et al (2015), during tank experiments.

MSS would note that fish may be able to detect stimuli yet not show any marked response, and that the concern posed by The Loughine Report is whether weak EMF fields might affect any geomagnetically driven migratory behaviour. MSS would note that both emigrating smolts and returning adult salmon and sea trout have now been shown to generally migrate close to the water surface which would usually be beyond the range where there would be any effect of buried cables on EMF. MSS would also note in relation to the cables under consideration that these carry AC which changes polarity many times a second, which would prevent any sustained directional message so any exposure would be likely to be very transient in migrating fish. For these reasons, MSS concludes that any effect on migratory behaviour is unlikely.

***iii)* The CH2M Report**
This provides a very useful overview of the matters raised in the Loughine report.

iv) ***The Merchant Report***
This specifically deals with how constructional and operational noise was dealt with in the assessment and concludes that although there are various deficiencies, these would not have affected the outcome, a conclusion which MSS would agree with. The report comments on the criticism which had been made of the lack of consideration in the ES of the particle motion component of sound, and notes that there are presently no assessment methodologies, standardised instruments, or noise exposure criteria with which to conduct such an assessment and that even if this was carried out such an assessment would be unlikely to increase the level of risk predicted for this development, due to the comparably low levels of noise expected from the installation of suction bucket foundations.

MSS would agree with these and the other conclusions in the report, but would note that while what is said in the report is in our view correct that there has been a recent increase in the relevant literature on particle motion and that consideration is currently being given to whether more should be required in future in relation to considering particle motion where very noisy activities such as pile driving and explosions are taking place.

Additional general comments from MSS
MSS is of the opinion that the Appropriate Assessment in February 2013 used the best available evidence at the time. However, there is an acceptance that there were, and still are, knowledge gaps, and that to that end, a programme of work has been developed in the intervening period. This includes work in relation to the spatial and temporal distribution of salmon smolts and adults through the National Research and Monitoring Strategy for Diadromous Fish, SpORRAn and ORJIP.

Further to the MSS summary above, MSS have confirmed that, in respect of particle motion, even though future work may be necessary, they are content that this does not affect the conclusions in the ES at this time.

<u>MS-LOT comments on key aspects raised in Hawkins Report</u>

<u>Evaluation of Underwater Noise</u>

The Hawkins Report contends that the evaluation of the impacts of underwater noise is so flawed that it undermines the conclusion in the EIA that the effects of noise upon salmon and sea trout are negligible or negligible to minor. This assertion is largely based on the assessment of the effects of underwater noise on salmon being based on sound pressure instead of particle motion which salmon are sensitive to. Annexe E of the Hawkins Report also identifies other generalised problems with the assessment of the impact of noise on fish (addressed in the Merchant Report). The consultation responses were sufficient to allow the Scottish Ministers to grant a s.36 consent and to conclude in the AA that EOWDC would not have a significant adverse effect any of the designated sites, notwithstanding the knowledge gaps surrounding noise impacts on salmon and sea trout. Further review of available information concludes that there are not any additional considerations or new information presented in light of the Hawkins Report that would provide an alternative conclusion to be reached in the ES in regards to construction based noise impacts. There is, however, a case for further consideration of the potential of

operational based noise impacts on salmonids. This is not considered to alter the conclusions of the ES owing to the limited data available and would provide a foundation for additional research into this impact post construction.

Whilst the Hawkins Report consistently highlights the importance of assessing the impact of noise in terms of particle motion it also acknowledges that "it is still relatively rare to specify and measure sounds in terms of particle motion levels" (page 107). In addition, the Hawkins Report highlights that there are limitations with regards to the availability of equipment for detecting and analysing particle motion. The EIA was arguably therefore based on the best available evidence at the time.

Summary: With reference to the Merchant Report, the scientific literature and through consideration of current best practice for EIA of underwater noise, it is our view that an EIA conducted according to current best practice would not identify a higher level of risk than the original EIA completed in 2011. This is primarily due to the use of suction buckets for the wind turbine foundations, rather than impact pile driving, as was assessed as worst case scenario in the EIA.

Suction Bucket Foundations

i) **Noise and Impact of Suspended Sediment**

The Hawkins Report contends that the assessment of noise was based on pile driving and now requires to be reassessed based on the effects of the installation and operation of suction bucket foundations. In addition, the Hawkins Report suggests that the impact of suspended sediments relative to the installation of suction bucket foundations was not considered in the EIA. The Hawkins Report however does not account for the use of the 'Rochdale Design Envelope' with the assessments in the ES being based on the worst case scenario for each receptor. The installation of suction bucket foundations and their impacts regarding noise and suspended sediments were considered within the 'Design Envelope' and a reassessment is not therefore required.

Summary: There are not any additional considerations or new information presented in light of the Hawkins Report that would provide an alternative conclusion to be reached in the ES in regards to consideration of noise or increased suspended sediment concentration through the installation of suction bucket foundations.

ii) **Additional Information**

The installation of suction bucket foundations was included in the 'Design Envelope'. This included consideration of the noise impact and sedimentation spill by way of comparison to the other types of potential foundations. The extent to which suction buckets were considered in the ES is consistent with the current proposals. This was reviewed last year when the suction bucket design outline and marine licence application for suction bucket trials were submitted to MS-LOT. The use of suction bucket foundations does not therefore trigger the additional information provisions under The Marine Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) and The Electricity Works (Environmental Impact

Assessment) (Scotland) Regulations 2017 (as amended) (hereinafter together referred to as 'the 2017 EIA Regulations').

The Merchant Report does however identify that *the structure of the wind turbine will affect how much of this sound is transmitted into the water column, and so suction bucket foundations could potentially transmit higher (or lower) noise levels than the monopile foundations that have thus far been studied. However, the noise levels reported for these operational monopile turbines are very low: is therefore little reason to expect that operational noise from turbines with suction bucket foundations will reach levels that would warrant mitigatory action in an EIA.* MS-LOT, with advice from MSS, agree with this assessment and determine therefore that this would not trigger the additional information provisions in the 2017 EIA Regulations nor would the conclusion or mitigation measures in the AA require to be updated.

Electromagnetic Fields

The Hawkins Report identifies that there is a lack of evidence on the impact of EMF on salmon and sea trout and therefore the efficiency of mitigation measures cannot be assessed. The Hawkins Report does not identify new information on this matter but instead views the lack of available evidence as sufficient justification to apply the 'precautionary principle' to the extent that EOWDC should be delayed until evidence is available.

The effects of EMF were considered as part of the Scottish Ministers' EIA consent decision and mitigation measures were included in the s.36 consent and marine licence requiring the burial of the cables so to reduce any potential effects of EMF on salmon and sea trout. In addition, as highlighted in the Vattenfall Report, subsequent to the EIA consent decision, studies have been carried out which now fill a number of the knowledge gaps relating to the effects of EMF on salmonids. These studies support the conclusions within the ES for EOWDC, however are not referenced in the Hawkins Report.

The Vattenfall Report does however identify that the EIA was based on the use of 33kV cables whilst the current proposal is to use 66 kV cables. The increase in cable voltage is not highlighted in the Hawkins Report. The Vattenfall Report indicates that MS LOT have already confirmed that the change 'can be considered within the consented envelope'. This is not an accurate statement as the change in cable was not considered in the ES and therefore was not within the design envelope. At the time of the proposed change in cable, MS-LOT sought advice from MSS, who advised that the strength of interaction with salmon is likely to increase with EMF field strength and the field strength is proportional to current in the conductor cables. The use of 66kV cables rather than 33 kV cables will reduce the current by a factor of 2 for the same power transmission. The EMF field strength will also therefore be reduced, and the mitigation in the AA should remain adequate. MS-LOT therefore assessed and determined that the proposed change to 66kV cables would have no new significant effects on the environment and neither the conclusion or mitigation measures in the AA required to be updated. Furthermore, as the change in cables does not identify significant effects on the environment that have not previously been identified, it does not trigger the multi-stage provisions of the 2017 EIA Regulations relative to additional information.

Summary: There are not any additional considerations or new information presented in light of the Hawkins Report that would provide an alternative conclusion to be reached in the ES in regards to consideration of EMF. Various studies have now confirmed that salmon migration (both smolts and returning adults) is generally close to the water surface, rather than to the sea bed. In addition, AC fields change polarity many times a second, which would corrupt any directional message used in any geomagnetically driven migratory behaviour. Both these factors reinforce the conclusion reached in the ES.

Precautionary Principle

The crux of the Hawkins Report is the contention that there are too many knowledge gaps with regards to the impact of noise and EMF on salmon and sea trout and how the 'precautionary principle' is therefore applied in this context. The Hawkins Report assesses the risk to salmon and sea trout in the absence of scientific evidence in this regard to justify the application of the 'precautionary principle' to the effect that EOWDC cannot proceed until this uncertainty is resolved. The EIA for the EOWDC however assessed the significance of the potential effects on salmon and sea trout and furthermore in light of the knowledge gaps included mitigation and monitoring measures within the s.36 and Marine Licence to reduce potential impacts.

Summary: With reference to these measures and other factors mentioned in the various reports and summaries we disagree with the Hawkins Report's suggested application of the precautionary principle.

Cable Laying Strategy

The Hawkins Report highlights that the EIA states 'the final export cable route will avoid any areas where coastal netting occurs'. However as noted in the Vattenfall Report the 'cable corridor' has already been consented by the Scottish Ministers. The cable corridor is quite large however the CLS condition in the s.36 consent clarifies that the final location of the cables will be detailed as part of the CLS and is subject to approval by the Scottish Ministers. The CLS condition states that the Scottish Ministers only require to consult with 'SNH and any such other advisors' and does not require consultation with other interested parties. Notwithstanding this, MS-LOT has consulted with [redacted] and the District Salmon Fishery Boards, whose comments and views have been considered.

Summary: Noise from cable laying is normally scoped out of EIAs, and was not raised in the Hawkins Report. For completeness, we note that the source level of cable trenching has been reported as 178 dB re 1 µPa (Nedwell et al., 2003), and that the main source of noise is expected to be the presence of the cable laying vessels (Meißner et al., 2006). MS-LOT extended the consultation to include interested parties, including [redacted].

Associated works

i) **Surveys** – The Hawkins Report identifies survey work carried out in 2011 and 2016 and queries why the potential effects on fishes were not considered, in particular in relation to the European Protected Species (EPS) licence granted for

the geophysical survey. Neither survey required a marine licence and in respect of the EPS licence, salmon and sea trout are not EPS and therefore did not require to be considered.

ii) **Exemption** – The Hawkins Report refers to geotechnical works carried out in 2016 which were exempt from the requirement of marine licence. The geotechnical works in the form of sediment sampling were carried out on the EOWDC site in April, June/July and August 2016. In each instance, MS-LOT consulted with the NLB, MCA and SNH regarding risks to navigation and if the works could have significant effects on a European Site and if they were capable of affecting a MPA. None of the consultees raised any issues. All the consultee responses are available online at MS-LOT's EOWDC webpage.

iii) **Marine Licence for Suction Buckets and Lidar** – Marine licences for such works have been processed under our standard consultation procedure which included consultation with SNH. A separate environmental assessment for these licences, as suggested within the Hawkins Report, was not required.

Cumulative Impacts

The Hawkins Report contends that since the EIA was agreed there have been several other proposals for developments in the area that might also affect salmon and sea trout. They include the extension of Aberdeen Harbour into Nigg Bay, in the vicinity of the mouth of the River Dee. Also, it is proposed that the Kincardine Offshore Wind Farm be developed to the south of the area. The Hawkins Report highlighted that it was important for the cumulative effects upon salmonids of these additional developments to be assessed before any of them were allowed to proceed.

The ES for EOWDC was produced in 2011 and provided consideration of the cumulative impacts of construction and operation with the proposed Round 3 windfarm in the Firth of Forth and the Moray Firth; concluding that there was unlikely to be a cumulative impact on salmonids. The proposals cited in the Hawkins Report were not referenced in the ES for EOWDC owing to the lack of development details available at that time of writing (2011). The Environmental Statements for the Aberdeen Harbour Extension Projects (Aberdeen Harbour Board, 2015) and the Kincardine Offshore Wind Farm (Atkins, 2015) are both dated 2015.

Both of the proposals cited in the Hawkins Report have provided consideration of the EOWDC in their consideration of cumulative impacts. The Environmental Statement for Aberdeen Harbour Extension Project considered the cumulative impacts of increased underwater noise and sediment plumes on salmonids and concluded the 'effects of the harbour construction and operation are forecast to be localised and temporary on low-value receptors and thus are judged to be not significant. No significant cumulative effects were identified' (Aberdeen Harbour, 2015). The Environmental Statement for Kincardine Offshore Wind Farm draws a comparable conclusion in relation to disturbance or physical injury from increased underwater noise (increased suspended sediments were not considered to be an impact resulting from the proposal), citing the nature and scale of the project provided a limited scope for cumulative impacts on salmonids.

Summary

There are not any additional considerations or new information presented in light of the Hawkins Report that would provide an alternative conclusion to be reached in the ES in regards to cumulative impacts.

Consultation

The Hawkins Report suggests that consultation with stakeholders with fishing interests has been poor and should be rectified and specifically mentions the owners of Blackdog fishing station.

Prior to the s.36 consent and marine licence being issued and also post s.36 consent, the owners of Blackdog fishing station and others were and have been consulted as a matter of process and their comments and material objections have been and will continue to be taken into account before decisions are made. It should, however, be noted that the owners are recorded as having no objections to the original s.36 consent and marine licence. MS-LOT also understand from exchanges with the owners of Blackdog fishing station that they are in dispute with AOWFL over an agreement that was made in 2012 and expired in 2015. MS-LOT view this as a matter for AOWFL and the owners of Blackdog fishing station.

Summary

The output of the stakeholder consultation process demonstrates that stakeholder consultation has taken place and MS-LOT will continue to make all reasonable efforts to undertake and facilitate where appropriate stakeholder engagement during the post consent process.

Monitoring and Research

The Hawkins Report notes the lack of availability of plans and programmes associated with EOWDC, a requirement for changes in the EOWDC since the preparation of the ES to be considered retrospectively and a need to conduct programmed research prior to the allowing the EOWDC to proceed.

All of the plans and programmes associated with EOWDC (and all other consented and pre-consented development in the Scottish Marine Area) are available on Marine Scotland's website.

Summary

This summary and the supporting reports address the points raised on monitoring and research.

Conclusion

The Hawkins Report does not consistently take account for the use of the 'Rochdale Design Envelope'. A significant part of the Hawkins Report focuses on the lack of

assessment of the impacts from the proposed use of suction bucket foundations. This matter is not addressed in the Vattenfall Report other than in the introduction, however the method was included within the 'Design Envelope'. Providing that the consideration within the ES and AOWFL's current proposed use is consistent, MS-LOT does not think a new EIA is required, despite the contention of the Hawkins Report.

In addition, the Hawkins Report invokes the precautionary principle unjustifiably. In an area of predictive science it would be unrealistic to use Professor's Hawkins application of the principle. The EIA consent decision for EOWDC included consideration of the knowledge gaps relative to the effects on salmon and sea trout. Mitigation measures have been included in the s.36 consent on a precautionary basis together with a comprehensive monitoring and research programme. In addition, the EIA consent decision was determined based on the worst case scenario for each receptor. The current proposals include the use of suction bucket foundations instead of piling which means EOWDC is likely to have a lesser impact on salmon and sea trout than assessed in the ES.

Marine Scotland Licensing Operations Team

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