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# Morlais Project

# Proof of Evidence
# Frank Fortune – Environmental Management and Mitigation Plan (EMMP); Benthic Ecology; and Migratory Fish Impacts

Applicant: Menter Môn Morlais Limited

Document Reference: MMC438 Proof of Evidence: Frank Fortune – Environmental Management and Mitigation Plan (EMMP); Benthic Ecology; and Migratory Fish Impacts

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# MMC438. Proof of evidence: Environmental Management and Mitigation Plan (EMMP); Benthic Ecology; and Migratory Fish Impacts.

## 1. Qualifications and experience

1. My name is Frank Fortune and I am a Technical Director at AECOM. I have a BSc Biology from the University of Portsmouth and MSc in Marine Development and Protection from Heriot Watt University. I have prepared this proof of evidence, which represents my true and professional opinion, based on my knowledge and experience.
2. I am a member of the Chartered Institute Ecology and Environmental Management (MCIEEM) and a Chartered Environmentalist (CEnv).
3. I have over 27 years of experience as an environmental scientist and consultant, during which time I worked for the Joint Nature Conservation Committee (JNCC), Scottish Natural Heritage (SNH), Northumberland County Council, British Maritime Technology (BMT) and Royal HaskoningDHV (RHDHV), before joining AECOM in January 2020.
4. I have over 20 years of environmental consultancy experience, working on Environmental Impact Assessment (EIA) and consenting for several marine and coastal development projects. I have specialised in the consenting of marine renewables energy projects since 2004, including successful consent of three (3) tidal stream and one (1) wave energy projects.
5. I have worked on the consenting, environmental management, mitigation and monitoring of several tidal stream projects prior to Morlais, as follows:
    - SeaGen, Strangford Lough, Northern Ireland. I was member of the EIA and consenting team for the project. Post consent I led the development of environmental mitigation and monitoring for the project.
    - Sound of Islay Tidal Array, Scotland. The Sound of Islay was the first tidal array consented in the UK. I oversaw the EIA in support of the consent application and provided post application support prior to consent. Changes to technology and project design required two variations of the original project consent, both of which I oversaw.
    - The Skerries Tidal Array, North Wales. The Skerries was the first tidal array consented in Wales. I was not part of the team undertaking the EIA and consent application. However, I was part of the team providing environmental monitoring and mitigation advice to the project team post consent.
    - MeyGen, Tidal Array, Scotland. MeyGen is the first tidal array constructed in the UK. I provided post consent support to the project team writing the onshore and offshore Environmental Management Plans (EMP) for the project post consent as part of the discharge of consents process.
    - Perpetuus Tidal Energy Centre (PTEC), Isle of Wight. PTEC was the first tidal array project consented in England. I led the team undertaking the EIA and supporting Front End Engineering and Design (FEED) works in support of the consent application.
6. The evidence presented below considers the following issues identified through post consent submissions to PINS Wales:
    - The key elements of the Outline Environmental Management and Mitigation Plan (EMMP), including:

- Intention to develop the Outline EMMP, post consent, into a Detailed EMMP;
- Contents of the Outline EMMP;
- Purpose of the EMMP at both Outline and Detailed stages;
- Adaptive Management approach to monitoring and mitigation within the Outline EMMP for marine mammals, seabirds and migratory fish; and
- Management of the EMMP.

- Approach taken to assessment of potential impacts upon Benthic Ecology. In particular:
  - Survey and characterisation of the benthic environment;
  - The approach taken to assessing the seabed footprint of Morlais' impacts on benthic ecology, with a focus on Annex 1 habitats;
  - Approach to preconstruction surveys and micro siting of tidal devices and associated infrastructure to mitigate potential impacts on Annex 1 habitats.
  - Approach to cumulative assessment of benthic impacts.

- Approach taken to the assessment of potential impacts upon Migratory Fish. In particular:
  - Assessment of the potential for adverse effect on site integrity (AEOSI) for migratory fish;
  - Commitment to inclusion of Migratory Fish monitoring within the outline EMMP.

## 2. Background to involvement in Morlais

7. Prior to joining AECOM in January 2020, I was a Technical Director at Royal HaskoningDHV, where I oversaw the delivery of EIA and consenting works for Morlais.
8. In February 2020 I was appointed by Menter Mon Morlais Ltd (the applicant) to provide post application support.
9. I am the main author of the Outline EMMP for the Morlais tidal stream project.
10. I have provided technical review of several chapters of the Environmental Statement submitted in support of consent applications for Morlais, including the Ornithology, Marine Mammal, Fish Ecology and Benthic Ecology chapters.

## 3. Essential reading

11. The essential reading list for further information regarding this proof of evidence is set out in Table 1 below.

**Table 1 Key documents relevant to the EMMP**

| Reference | Submission Documents |
|---|---|
| MDZ/A25.11 | MMC064 MOR-RHDHV-DOC-0016 Vol I_Chapter 11: Marine Ornithology |
| MDZ/A26.6 | MMC091 MOR-RHDHV-DRW-0085 Vol II_Chapter 11: Marine Ornithology |
| MDZ/A27.5 | MMC107 MOR-RHDHV-APP-0017-0019 Vol III_Chapter 11: Marine Ornithology |
| MDZ/A25.12 | MMC065 MOR-RHDHV-DOC-0020 Vol I_Chapter 12: Marine Mammals |
| MDZ/A26.7 | MMC092 MOR-RHDHV-DRW-0086 Vol II_Chapter 12: Marine Mammals |

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| MDZ/A27.6 | MMC108 MOR-RHDHV-APP-0021-0024 Vol III_Chapter 12: Marine Mammals |
| MDZ/A27.11 | MMC033 MOR-RHDHV-DOC-0067 HRA Information to Support Habitats Regulations Assessment |
| | **Supplementary environmental information** |
| MDZ/A31.2 | MMC351 MOR-MSP-DOC-003 Additional Information to Support Morlais Habitats Regulations Assessment (migratory fish) |
| MDZ/A31.3 | MMC352 MOR-MSP-DOC-004 Further Environmental Information Benthic_Annex 1 habitats |
| MDZ/A31.9 | MMC360 MOR-RHDHV-DOC-0153 Marine Ornithology Revised Collision Risk Modelling Signposting document |
| MDZ/A31.10 | MMC361 MOR-RHDHV-DOC-0115 (03) Marine Ornithology Collision Risk Modelling Note |
| MDZ/A31.11 | MMC362 MOR-RHDHV-DOC-0016 (04) Vol I_Chapter 11: Marine Ornithology |
| MDZ/A31.12 | MMC363 MOR-RHDHV-APP-0019 (04) Vol III_Chapter 11.3: Marine Ornithology |
| MDZ/A31.13 | MMC364 MOR-RHDHV-DOC-0118 (02) Marine Mammals Additional Collision Risk Modelling |
| MDZ/A31.14 | MMC365 MOR-RHDHV-DOC-0020 (02) Vol I_Chapter 12: Marine Mammals |
| MDZ/A31.15 | MMC366 MOR-RHDHV-APP-0022 (02) Vol III_Chapter 12.2: Marine Mammals |
| MDZ/A31.16 | MMC367 MOR-RHDHV-DOC-0067 (02) Information to Support HRA |
| MDZ/A31.17 | MMC368 MOR-RHDHV-DOC-0154 Marine Mammals Revised Collision Risk Modelling Signposting document |
| **Reference** | **Post-Submission Documents** |
| Version 6 November 2020 | Outline Environmental Mitigation and Monitoring Plan (EMMP) - Outline Adaptive Management Approach to Environmental Mitigation and Monitoring during the Phased Deployment of the Morlais Project |
| **Reference** | **NRW and Other Relevant Response Documents** |
| MDZ/K1 | MMC250 MOR-POL-DOC-053 NRW Guidance for Marine Developers- Using adaptive management for marine developments https://naturalresources.wales/guidance-and-advice/business-sectors/marine/using-adaptive-management-for-marine-developments/?lang=en |
| MDZ/F15.3 | MMC445 Advice on adaptive management of the risk of collision impacts on protected marine mammal species in Welsh waters from the Morlais Project |
| **Reference** | **Relevant Guidance and Reports** |
| Not core document | East Anglia Three Limited. 2015. East Anglia Three. *Outline Offshore Construction Environmental Management Plan. Document Reference – 8.17.* https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010056/EN010056-000464-8.17%20Offshore%20Construction%20Environmental%20Management%20Plan.pdf |
| MDZ/K2 | European Commission. 2011. *Guidance Document - The Implementation of the Birds and Habitats Directives in estuaries and coastal zones.* https://ec.europa.eu/transport/sites/transport/files/modes/maritime/doc/guidance_doc.pdf |
| Not core document | Orstead. 2018. *Hornsea Project Three Offshore Wind Farm In-Principle Monitoring Plan.* PINS Document Reference: A8.8 APFP Regulation 5(2)(q). https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-000652-HOW03_8.8_In%20Principle%20Monitoring%20Plan.pdf |
| Not core document | Savidge, G, Ainsworth, D., Bearhop, S., Christen, N., Elsaesser, B., Fortune, F., Inger, R., Kennedy, R., McRobert, A., Plummer, K. E., Pritchard, D. W., Sparling, C. E. and Whittaker, T. J. T. 2014. *Strangford Lough and the SeaGen tidal turbine.* In Marine Renewables and Society. Ed. by M.A. Shields. Springer, Dordrecht. |
| MDZ/F19 | MMC347 Scottish Natural Heritage (SNH) (2016) Assessing collision risk between underwater turbines and marine wildlife. SNH Guidance Note (version 1 May 2016) https://www.nature.scot/sites/default/files/2017-09/Guidance%20Note%20- |

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| | %20Assessing%20collision%20risk%20between%20underwater%20turbines%20and%20marine%20wildlife.pdf |

## 4. Structure of evidence

12. This Evidence is structures as follows:
    - Section 5 - The Environmental Monitoring and Mitigation Plan (EMMP);
        - EMMP Status;
        - Precedents providing Outline Plans Pre-Consent;
        - Contents of the Outline EMMP;
        - Purpose of the Outline EMMP;
        - Purpose of the Detailed EMMP;
        - Modelling studies;
        - Population studies;
        - Phased deployment of Morlais;
        - Adaptive management and mitigation;
        - Triggering of management measures;
        - Aims and objectives of the EMMP;
        - Monitoring indicators and questions;
        - Management of the detailed EMMP;
        - Compliance with the detailed EMMP;
        - Precedent for EMMP and adaptive management approach;
    - Benthic Ecology;
        - Survey and characterisation;
        - Assessment of Annex 1 habitats;
        - Preconstruction surveys and micro siting;
        - Invasive non-native species (INNS);
    - Migratory Fish;
        - HRA consideration of migratory fish;
        - Monitoring commitments for migratory fish;
    - Summary and Conclusions.
13. Appendices 1 to 3 consider Statements of Case submitted to PINS which identify issues relevant to the EMMP, Benthic Ecology and Migratory Fish.

## 5. The Environmental Monitoring and Mitigation Plan (EMMP)

### 5.1 EMMP Status

14. The Outline EMMP is one of several outline management plans submitted to support the consent application for Morlais.
15. The applicant is committed to the development of each of the outline management plans as part of the post consent discharge of consent conditions.
16. The Outline EMMP is intended to evolve post consent to become a Detailed EMMP, taking account of consent conditions, agreement of monitoring and mitigation, and finalisation of both project design and installation methods.

17. This approach of Outline EMMP and evolution into Detailed EMMP recognises that the development and understanding of tidal devices continues to evolve, as does the technology for monitoring those devices and mitigating any impacts identified. Therefore, the mechanism for agreement of appropriate monitoring, mitigation and management measures should be able to reflect the most up to date information and understanding, post consent, with mechanisms for agreeing those measures contained within appropriate consent conditions.
18. The Outline EMMP was not intended to be complete at application stage, but rather its purpose is to demonstrate to regulators the applicant's commitment to the management process described in the Outline EMMP, and to the development of a Detailed EMMP post consent.
19. Since submission, there has been regular engagement with the regulators and their conservation advisor (PINS Wales, Natural Resources Wales ('NRW') consenting and NRW Advisory), as well as non statutory third parties such as RSPB. This engagement, and advice and comment received has resulted in ongoing evolution of the Outline EMMP (to reflect the outputs of that engagement), with several updated versions generated and further revised, with the most recent OEMMP circulated in November 2020.
20. As part of regular engagement, constructive advice has been provided by NRW consenting and NRW Advisory regarding changes and improvements that should be made to the contents of the Outline EMMP in order to provide assurance that deployment of Morlais under the EMMP will ensure that there is no adverse effect on site integrity for sites designated under the European Habitats Directive. Most recently, advice has been provided as follows:
    - Marine Mammals. During recent engagement (video meeting and email of 15th October 2020) NRW Advisory provided advice, (advice document MMC368 MOR-RHDHV-DOC-0154 Marine Mammals Revised Collision Risk Modelling [MDZ/A31.17]) on the commitments that required within the Outline EMMP in order to reassure regulators that deployment of Morlais will not result in AEOSI.
    - Benthic Ecology. NRW Advisory provided advice (video meeting of 9th of October) on the clarifications required to address concerns regarding the ability to mitigate potential impacts on Annex 1 benthic habitats.
    - Migratory Fish. NRW Advisory provided advice (video meeting of 7th of October 2020) on their requirement for an HRA addendum providing additional inclusion of a commitment to use of monitoring data from the EMMP in order to increase the evidence base behind the assessment of potential impacts from Morlais.
21. The advice provided through engagement has been incorporated into the current version of the Outline EMMP (Version 6, November 2020).

## 5.2 Precedents providing Outline Plans Pre-Consent

22. Outline or 'In-principle' Management Plans such as the Outline EMMP, are regularly submitted in support of applications for major infrastructure projects.
23. Several examples of Outline Plans can be viewed on the PINS website. Examples include:
    - East Anglia Three Outline Construction Environmental Management Plan (CEMP) (East Anglia Three Limited, 2015), which details the project developer's proposed approach to the management of environmental risks and the mitigation measures they have identified as being required during construction of an offshore wind farm; and
    - Hornsea Project Three In-Principle Monitoring Plan (Orstead, 2018), which details the environmental monitoring works proposed in support of a deemed Marine Licence for an offshore wind farm.
24. Outline or In-Principle Plans demonstrate commitment by the developer to undertaking post consent management measures. Outline plans are intended to be further developed post consent in order discharge a consent condition, with that consent condition and the mechanisms for the condition's discharge formalising management and mitigation commitments made by the applicant.

## 5.3 Contents of the Outline EMMP

25. The main headings of the EMMP are:
    - **Introduction** – detailing the purpose of the Outline EMMP, why it is required, and the principles underpinning its proposed operation (including the phasing of deployment, use of adaptive management approaches, the use of mitigation to avoid significant effects, and the application of trigger points to activate increased mitigation).
    - **The EMMP process** – detailing terms of reference, aims and objectives, the anticipated process of managing the EMMP, discussion of how compliance with the EMMP will be ensures, the use of trigger points during monitoring to 'activate' management measures such as increased levels of mitigation, monitoring questions which the EMMP will seek to answer, and the monitoring indicators which will be used to inform that process.
    - **EMMP roles and responsibilities** – detailing ownership of the EMMP by the applicant, while the management of the EMMP will be undertaken by an Advisory Group with regulator and technical advisor participation. The proposed approach to governance of the Advisory Group is also outlined, as well as mechanisms for regular reporting of findings, and for managing emergencies.
    - **Approach to monitoring and mitigation methods –** provides a review of methods and their suitability for data collection suitable to provide monitoring indicator data and ultimately to address monitoring questions.
    - **Outline schedule of tasks –** provides an indicative timeline for undertaking deployment of the project.
    - **Summary of outline approach** – outlines key elements of the EMMP in brief.

## 5.4 Purpose of the Outline EMMP

26. Understanding of tidal technologies, monitoring methods and approaches to mitigation continues to evolve, and current understanding of mechanisms for environmental impacts will differ from understanding in the years following consent, but prior to deployment.
27. The purpose of the Outline EMMP is to demonstrate commitment to the ongoing management of Morlais in a way that avoids potentially significant environmental impacts on marine mammals and seabirds.
28. The Outline EMMP proposes indicative aims, objectives, monitoring methods and mitigation measures, which will be revised and agreed in a Detailed EMMP post consent, using the most up to date knowledge and understanding at that time.

## 5.5 Purpose of the Detailed EMMP

29. Compliance with the Outline EMMP and the requirement to obtain the approval of Regulators for a detailed EMMP will be secured by a condition on the Marine Licence.
30. The **first purpose** of the detailed EMMP will be to avoid significant adverse impacts from Morlais upon populations of marine mammals during the operation of Morlais, allowing a favourable Habitats Regulation Appraisal (HRA) of Morlais under the Habitats Directive. The applicant is committed to ensuring adequate and effective mitigation and monitoring for marine mammals. This commitment will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.
31. The EMMP will focus on populations of two species of cetacean, bottle-nosed dolphin and harbour porpoise, which are Special Area of Conservation (SAC) features, for which potential AEOSI is currently predicted if a full deployment (240MW) of Morlais were to be undertaken. The applicant is committed to ensuring that no project deployment of a scale which may cause AEOSI occurs.
32. The EMMP will also consider potential for impacts upon populations of grey seal and harbour seal which are SAC features. Note that no potential for AEOSI is predicted for seals at full deployment (240MW) for Morlais.
33. Modelling shows that less than full deployment of Morlais (<240MW) can be undertaken without significant effect on marine mammals. The scale of the 'less than full' deployment will be dependent on the tidal technology type deployed and its characteristics when interactions with marine mammals and birds are modelled.

34. The EMMP will also contain measures safeguarding populations of other dolphin, whale and seal species for which potentially significant effects are not predicted.
35. The **second purpose** of the detailed EMMP will be to avoid significant adverse impacts of Morlais upon seabirds.
36. The EMMP will focus on two species of seabird, razorbill and guillemot. Theses seabird species are part of the population of nearby SSSI seabird populations but are not features of any European site. Potentially significant effects on populations of these seabirds are currently predicted if a full deployment (240MW) of Morlais is undertaken.
37. Modelling studies (see section 3.6, Chapter and Chapter indicate that a smaller scale (less than 240MW) deployment of Morlais would be possible without adverse effects on seabird populations. In particular, the level of deployment proposed to avoid impacts on marine mammals, is not predicted to have any adverse impact
38. The **third purpose** of the detailed EMMP will be to avoid adverse impacts of Morlais upon migratory fish. The potential for such impacts is unknown, with limited data available to support assessments, although the potential for such impacts is expected to be very limited.
39. The applicant is committed to contribute to the knowledge base of regulators by ensuring that data reviewed as part of the monitoring and mitigation of potential marine mammal and seabird impacts, is also reviewed for potential impacts on migratory fish.
40. The applicant will make all data collected by the wider EMMP monitoring programme available to migratory fish researchers as part of a wider commitment to support studies of migratory fish in North Wales, which have potential to inform ongoing management of Morlais.
41. Other elements of monitoring may be included in the EMMP is the Advisory Group considers this to be appropriate, for example modelling of potential noise from devices to be deployed.

## 5.6 Modelling studies

42. Two types of modelling have been used to help predict potential impacts upon marine mammals and seabirds. The types are:
    - Encounter Rate Modelling (ERM); and
    - Collision Risk Modelling (CRM).
43. The ERM and CRM modelling work undertaken for marine mammals and for seabirds, which was included as part of the submission, has been updated to address an error identified in one part of the calculation. The updates have been provided in the Core Documents as clarifications, with updates to Chapters 11 and 12, relevant appendices and supporting documents, including information to support HRA. The updates make no change to either the indicative maximum scale of deployment of Morlais' first phase, or to the approach to management and mitigation of Morlais proposed in the Outline EMMP.
44. Both models give similar, but subtly different results, indicating a level of physical impact by the tidal devices upon marine mammals or birds.
45. The models have been run to consider the effects of arrays of a number of different types of tidal stream devices, at different scales of deployment (varying numbers of tidal devices), on a number of marine mammal and seabird species.
46. The outputs suggest a level of deployment for each type of tidal device, at which no significant effect on marine mammal or seabird species is predicted.
47. In all the modelling undertaken, potential for impact upon marine mammals was predicted at lower levels of deployment (MW or numbers of devices) than it was for seabirds. As a result, any deployment of a scale low enough to avoid predicted impacts on marine mammals, will be also avoid predicted impacts on seabirds.
48. The models are both considered to be precautionary in their approach. In other words, they are thought to make assumptions which overestimate the potential for collision / encounter, as detailed in the relevant

assessment Chapters 11 and 12 of the Environmental Statement (ES) and their supporting Appendices (as revised) and assessment guidance (SNH, 2016). An example of this precautionary approach is the treatment of nocturnal diving behaviour of seabirds as similar to daytime behaviour, when this is not thought to be the case.

## 5.7 Phased deployment of Morlais

49. A phased approach to deployment of Morlais is proposed, over several years.
50. The scale of the phases is not defined at this stage, however, there is a commitment that there will be no deployment at a scale (MW or number of devices) with potential to have a significant effect on marine mammals or seabirds.
51. The scale of the first phase of deployment will be small enough to avoid any potential for AEOSI as a result of Morlais.
52. Deployment at a small scale allows the collection of monitoring data, to inform management of Morlais, allowing the level of precaution in ERM and CRM to be tested, and the behaviour of marine mammals, seabirds and migratory fish around the first deployment to be observed.
53. The efficacy of monitoring techniques and equipment, as well as potential additional mitigation measures will be tested, demonstrated and refined during the first phase of deployment, which the scale of deployment sufficiently small that no significant effect is predicted.
54. Further deployment of phases beyond the first (no effect) phase will not be undertaken without the agreement of Regulators and will be dependent on the monitoring results during Phase 1.
55. An ongoing programme of monitoring and evaluation is proposed throughout the deployment of all Phases of Morlais.
56. Additional mitigation may be required for later phases of deployment, and methods of mitigation, including acoustic and visual deterrents are considered.

## 5.8 Adaptive management and mitigation

57. As described in Section 5.6, the updates made to ERM and CRM modelling provided as clarifications do not change the indicative maximum scale of deployment of Morlais' first phase because there was no error in the calculations for the turbine that gives the maximum first phase scale. The approach to management and mitigation of Morlais proposed in the Outline EMMP remains the same.
58. The deployment of the first phase of Morlais at a scale small enough to avoid significant impact upon marine mammals and seabirds, with subsequent management of Morlais (including deployment of further phases of Morlais, in terms of increased MW and / or increased numbers of devices) or deployment of further mitigation measures, being directly informed by the results of monitoring work, is a process described as Adaptive Management.
59. Adaptive management can be defined as follows *"An iterative process where uncertainty regarding environmental effects is progressively reduced, through managed; science led monitoring. In areas of environmental sensitivity, it may be necessary to put in place short-term precautionary mitigation measures, to reduce potential for effects to a level considered acceptable to regulators and stakeholders."* (Savidge *et al*. 2014)
60. Coastal management guidance from the European Commission (European Union, 2011) outlines how Adaptive Management approaches can be used where because of limits to scientific understanding, it is not possible for the competent authority to fully ascertain the absence of adverse effects on Natura 2000 features.
61. NRW guidance on adaptive management advises that Adaptive Management is *"a structured, iterative approach to environmental assessment, allowing the management of a project to be adapted based on learning once the development has been installed or constructed".* NRW further advises that *"an Environmental Advisory Group made up of a range of stakeholders including developer, regulators,*

*advisors and key stakeholders can be a useful way of implementing and managing an agreed AEMP and providing appropriate governance"*

62. It is proposed that the development of the Outline EMMP into the Detailed EMMP and the management of the Detailed EMMP are overseen by an Advisory Group with membership aligned with NRW's guidance.
63. It is proposed that management of Morlais is informed by monitoring results throughout the phased deployment of the project.
64. The most important Phase of deployment is Phase 1, where mitigation is provided by the scale of deployment only.
65. If required, additional mitigation may be deployed, with 4 tiers of mitigation proposed as follows:
    - Tier 1 – deployment of tidal devices at magnitude (MW) below levels of predicted effect (using best available data);
    - Tier 2 – active deterrence - deployment of mitigation measures (such as acoustic deterrents for mammals or visual deterrents for seabirds) around operating tidal devices, and monitoring of their efficacy;
    - Tier 3 – The slowing or other modification of the operation of installed tidal devices to reduce predicted risks; and
    - Tier 4 – The stopping or removal of tidal devices previously deployed by Morlais.

## 5.9 Triggering of management measures

66. A series of indicative trigger points are proposed at which Morlais would move to a higher tier of mitigation after initial deployment.
67. Trigger points will be confirmed with the Regulator post consent and pre-deployment.
68. The indicative trigger points proposed in the Outline EMMP are related to the proximity of marine mammal or seabird species to operational tidal devices and the proposed mitigation associated with each trigger is tabulated in the Outline EMMP and repeated in Table 1 below.

**Table 1 Illustration of potential use of proximity trigger points**

| **Trigger point** | **Far field**<br>(Wider study area outside array) | **Medium field**<br>(Within array area but not approaching devices) | **Near field proximity**<br>(Approaching device – for example, within 30M) | **Potential collision**<br>(within 10m of device, collision assumed) |
|---|---|---|---|---|
| **Species group** | | | | |
| **Cetacean (bottle nosed dolphin)** | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Activate active sonar | Active monitoring and rapid review of data.<br>Deployment of acoustic deterrence | Cessation of operation.<br>Emergency / incident procedure<br>Review data to determine likelihood of collision and further management actions. |
| **Cetacean (harbour porpoise)** | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Activate active sonar | Active monitoring and rapid review of data.<br>Deployment of acoustic deterrence | Slowing of devices.<br>Emergency / incident procedure.<br>Review data to determine likelihood of collision and further management actions. |
| **Cetacean (other)** | Data form part of standard reporting. | Activate active sonar | Active monitoring and rapid review of data.<br>Deployment of acoustic deterrence | Slowing of devices<br>Emergency / incident procedure. |

| Trigger point | Far field<br>(Wider study area outside array) | Medium field<br>(Within array area but not approaching devices) | Near field proximity<br>(Approaching device – for example, within 30M) | Potential collision<br>(within 10m of device, collision assumed) |
|---|---|---|---|---|
| **Species group** | | | | |
| | Consideration of monitoring questions relating to use of study area. | | | Review data to determine likelihood of collision and further management actions. |
| **Diving seabird (razorbill or guillemot)** | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Deployment of visual deterrence.<br>Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. |
| **Pinniped (grey or harbour seal)** | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Data form part of standard reporting.<br>Consideration of monitoring questions relating to use of study area. | Deployment of acoustic deterrence.<br>Review data to determine likelihood of collision and further management actions. |

## 5.10 Aims and objectives of the EMMP

69. A series of aims and objectives are proposed in the Outline EMMP and will be agreed with Regulators for the Detailed EMMP post consent and pre-deployment.
70. The main aim is to allow development of Morlais to proceed without significant effects upon marine mammals and diving birds through collision with tidal energy converters (TECs).
71. A subsidiary aim is to contribute to the evidence base for the behaviour of marine mammals, seabirds and migratory fish around TECs and arrays of TECs through appropriate monitoring measures.
72. The main objective is to mitigate collision risks through the limitation of deployments of tidal devices to levels (MW) of deployment where no significant adverse effect as a result of collision with tidal devices is predicted;

## 5.11 Monitoring indicators and questions

73. To ensure the EMMP remains focussed on its agreed aims and objectives a series of monitoring questions and related monitoring indicators have been proposed, which relate specifically to the proposed aims and objectives. The monitoring questions and indicators will be agreed with Regulators post consent and prior to deployment.

## 5.12 Management of the detailed EMMP

74. A Detailed EMMP will be submitted for approval to the Regulators prior to the deployment of any phase of Morlais.
75. The creation of an 'Advisory Group' to manage and oversee the operation of the EMMP is proposed, in consultation with the Regulator.
76. An independent chair of the Advisory Group is proposed. It is anticipated that this will be a person with regulatory experience of deployment and the adaptive management of tidal stream projects.
77. Experience from other tidal projects indicated that the Advisory Group would benefit from direct communication with the Regulator and their technical advisors. An appropriate mechanism to facilitate such communication will be one of the first actions of the Advisory Group post consent.

78. NRW's membership of an Advisory Group or equivalent body is recommended within NRW's current advice on adaptive management for marine developments (Natural Resources Wales, 'Using adaptive management for marine developments - Guidance for marine developers', 2020 [MDZ/K1]).

## 5.13 Compliance with the detailed EMMP

79. It is anticipated that enforcement of the detailed EMMP and other marine management measures will be through conditions placed on the Marine Licence, with NRW Licensing as the regulator.
80. NRW Licensing will have the ability to curtail operation of Morlais in response to adverse environmental impacts reported to it through the EMMP.
81. NRW Licensing will control the scale and pace of deployment of phases of Morlais, through application of the detailed EMMP mechanism, with the ability to require cessation of operations and / or removal of technology if monitoring measures indicate potential for adverse effects on integrity of European sites.

## 5.14 Precedent for EMMP and adaptive management approach

82. Several tidal energy projects have proposed the establishment of post consent adaptive management measures to address potentially significant effects in European Sites and European Protected Sites. These include:

- The SeaGen Tidal Turbine Project, Strangford Lough, Northern Ireland.
    - SeaGen was the world's first consented commercial scale demonstration project, with a single 1.4MW device. Consent was granted in 2005 on condition of a detailed adaptive management plan for environmental mitigation and monitoring.
    - A Science Group was established to manage a monitoring and mitigation plan, with deployment in 2008, after agreement of the plan. The device operated from 2008 to 2013, with a reduction of mitigation measures over that time, informed by the output of monitoring works.
    - The Science Group membership included an independent chair, the project developer, the Regulator, Statutory Conservation Agencies, developer appointed Secretariat (environmental consultancy) and technical experts (Queens University Belfast, Sea Mammal Research Unit).
    - A Liaison Group consisting to wider stakeholders and NGOs was established to facilitate transmission of monitoring outcomes and management decisions taken by the Science Group.

- MeyGen Tidal Array Project, Pentland Firth, Scotland.
    - The MeyGen Project was the world's first constructed commercial tidal array.
    - Consent was granted for the full project capacity (398MW) on condition of phased deployment of the project, with the first phase (Phase 1A) of 6MW at a small enough scale that no adverse effect on marine mammals was indicated.
    - Informed by lessons learned from the management of monitoring and mitigation of the SeaGen Project, an Advisory Group was established to oversee adaptive management of a mitigation and monitoring plan for the MeyGen Project, with phases of deployment beyond the initial Phase 1A deployment (6MW) dependent on the outputs of monitoring works.
    - The Advisory Group included an independent chair, the developer, the Regulator, Statutory Advisors, and technical experts (including Aberdeen University and the Sea Mammal Research Unit).
    - On the basis of monitoring data collected the Regulator has released further phases of deployment, with an additional 73.5MW of deployment now permitted.

- The Skerries Tidal Array Project, North Wales.
    - The Skerries Tidal Array Project was consented but not constructed.
    - Consent was granted for deployment of a 10MW array, subject to agreement of an adaptive management plan, supported by mitigation and monitoring.
    - A Science Group was established to oversee the plan, with an independent chair, and members including the regulator, scientific advisors and secretariat.

- Funding for the project was withdrawn after failure of grant applications.

83. In all cases an initial deployment was undertaken or proposed, with mitigation in place to reduce the potential significance of impacts on protected species.
84. In all cases oversight and management by an independently chaired group was agreed, with involvement of the regulator. The most recent example is from the MeyGen Project, where regulators and statutory nature conservation advisors were full members of the independently chaired Advisory Group overseeing the implementation of the management and mitigation plan for the project.

## 6. Benthic Ecology

### 6.1 Survey and characterisation

85. Seabed surveys of the Morlais Demonstration Zone and a surrounding buffer area were undertaken in 2018. An initial geophysical survey was undertaken to map the seabed followed by a 'ground truthing' survey using seabed grabs and drop down camera / video systems.
86. The ability to collect seabed ground truth data via grab systems was severely limited due to the sparsity of surface sediment of sufficient depth to allow successful grab operation. The majority of the ground truth data collected was via drop camera / video transects.
87. 42 ground truth stations were sampled, with each video transect resulting in several images taken as the camera moved along the transect. 277 images were collected from the 42 sample stations, along with 200 minutes of video footage.
88. The applicant considers that the survey is considered sufficient for seabed habitat characterisation as required for EIA purposes, and in a meeting of 9th October 2020, NRW agreed that the survey was a good characterisation survey and the maps generated were suitable for EIA assessment purpose.

### 6.2 Assessment of Annex 1 habitats

89. To ensure a worst-case scenario assessment was presented within the ES, all areas mapped as potential Annex I stony, biogenic and bedrock reef were grouped into two Valued Ecological Receptor (VER) categories; VER 9 - High energy infralittoral and circalittoral rock/ coarse sediment with Annex I stony/bedrock reef; and VER 10 (Circalittoral Sabellaria reefs – Annex I biogenic reefs). The impact assessment then assumed that all the subtidal habitat loss occurred within these 2 VER habitat groups.
90. Assumption of all loss in the 2 VER habitat groups is a highly conservative approach, which significantly overestimates the likely significance of Annex 1 habitat loss. This approach was adopted to avoid claims that the assessment was attempting to downplay potential impacts on those habitats.
91. The actual loss of Annex 1 habitat will be less than assessed by the EIA as some of the habitat loss will instead occur in non-Annex I habitats.
92. During the applicant's meeting with NRW on 9th of October 2020, the potential role of biodiversity enhancement in the design of project components, in particular: TEC foundations; cable protection and anchor / mooring structures, was explored. The applicant has agreed to and will commit to exploring this approach with developers where required.
93. The applicant proposes the following wording to be captured in the draft Marine Licence conditions:

    *"Where it is not possible to avoid damage/loss of Annex I habitats via micro-siting, then further mitigation via biodiversity enhancement of seabed structures will be investigated and implemented in agreement with NRW".*

### 6.3 Preconstruction surveys and micro siting

94. The applicant is committed to the completion of preconstruction surveys to map Annex 1 habitats at locations for array deployment to allow micro-siting of seabed mounted infrastructure (including tidal device

foundations, anchors, cables and cable protection) in order to avoid any significant impacts on Annex 1 habitats.

95. The applicant does not consider that a pre-consent survey is required, or that such a survey would change the conclusions of the ES. The applicant is, however, committed to undertaking pre-construction surveys and has included such a condition in the draft Marine Licence conditions.

### 6.4 Invasive non-native species (INNS);

96. The applicant is committed to management of invasive non-native species (INNS) in an appropriate manner. An outline INNS risk assessment (INNS RA) has been provided, as has an outline Construction Environmental Management Plan (CEMP). Measures to manage INNS during construction, operation and decommissioning will be agreed with NRW and included in the detailed INNS RA and CEMP.

## 7. Migratory Fish

### 7.1 Habitats Regulation Appraisal for Migratory Fish

97. An addendum to the Information to Support Habitats Regulations Assessment [MDZ/A31.16] previously submitted by the Applicant was included in clarifications.

98. The addendum presents additional information on Stage 2 (Assessment) of the shadow Habitats Regulations Assessment for Morlais, in relation to migratory fish. This includes:

    An update to Stage 1 (Screening) in relation to Annex II migratory fish species;

    Additional Stage 2 information and assessment.

99. The purpose of the addendum is to allow NRW to reach a conclusion of no AEOSI.

100. The following potential pathways for impact were considered:

- Disturbance of migratory routes by underwater noise;
- Changes in water quality of migration routes;
- Changes in prey availability along migratory routes;
- Barriers to migratory routes; and
- Electromagnetic fields (EMF).

101. The potential for AEOSI was identified as a result of uncertainty as to potential for barriers to migration through potential collision with tidal devices.

102. Due to the limited data available on routes followed by migratory fish species, there is a high level of uncertainty with regards to potential exposure of these species to tidal energy devices. Uncertainty regarding the potential collision risk is the result of from limited understanding of the ability of these animals for long range avoidance, i.e. the potential of the fish to detect the operational noise of the device, and their ability for close range evasion, i.e. - the potential of the fish to visually detect the device.

103. Given this uncertainty, LSEs upon designated Annex II migratory fish populations for collision risk could be excluded without further analysis and further assessment was presented to inform Stage 2 of the HRA process.

104. The assessment focussed upon:

- Identification of conservation objectives for each of the designated sites screened into Stage 2 assessment; and
- Assessment of impact pathways, with a single assessment for all potentially affected sites.

105. A worst case scenario was assumed, that tidal devices are a risk of collision to migratory fish species that occupy the water column and with any interaction resulting in the fatality of the animal involved.

106. This is a highly precautionary assumption that assumes no detection/avoidance of the TECs and also does not take account of the fact that any devices would be installed in an open-water environment where fish passage would not be largely constrained or impeded.

107. Knowledge gaps were identified pertaining to avoidance by migratory fish, with limited available data suggesting avoidance may be significant..

108. The Applicant maintains that the presence of TECs in the MDZ poses minimal risk of collision to migratory fish species. However, in recognition of the knowledge gaps identified above, the Applicant commits to undertaking a level of monitoring that is intended to provide supportive evidence that conclusion.

### Inclusion of Migratory Fish within the EMMP

109. The applicant is committed to the inclusion of migratory fish as one of the species to monitored within the EMMP.

110. The EMMP will collect acoustic imaging data and video footage to assess interactions of marine mammals and seabirds with devices, and when video data are analysed for marine mammal and seabird behaviour, the same footage will also be reviewed and analysed to identify if they also contain potential information on behaviour of migratory fish.

111. This will aim to detect any migratory fish in proximity of the TEC devices; describe any observed avoidance behaviour; identify any interactions between turbine blades and migratory fish, and where possible determine the consequence of any collisions, should any occur.

112. Analysis of the video monitoring data described above for migratory fish, will be in addition to the monitoring of those same data for marine mammal and bird activity. The trigger for analysis will be the proximity of marine mammals or seabirds to the TEC being monitored.

113. The Applicant will also make all data collected during monitoring available for use by researchers with the aim of supporting develop this broader understanding of interactions between TECs and migratory fish..

114. The Applicant recognises the wider need to develop a more strategic approach to developing the understanding of potential interactions between migratory fish and tidal energy projects and will work with NRW to investigate how similar strategic-level work of relevance to management of Morlais could be supported in Wales.

115. The applicant is committed to supporting wider studies and monitoring of migratory fish, which have direct implications for the management of Morlais.

## 8. Conclusions and summary

116. Responses to NRW and RSPB Statements of Case as they relate to the EMMP, Benthic Ecology and Migratory fish are provided in Appendix 1 – EMMP, Appendix 2 – Benthic Ecology and Appendix 3 – Migratory Fish. Responses to the North Wales Wildlife Trust (NWWT) Statement of Case as it applies to benthic ecology and INNS are also provided in Appendix 2 – Benthic Ecology.

### 8.1 EMMP

117. Responses to NRW and RSPB Statements of Case comments on the EMMP are provided in Appendix 1.

118. The EMMP is provided in Outline form to allow for the agreement of devices for initial phases of deployment, ongoing development of tidal technology, development of monitoring and mitigation methods and improved scientific understanding of tidal technology impacts post consent, but pre deployment.

119. There is precedent for the provision of environmental management, monitoring and mitigation plans in outline form, with several examples available from PINS. All such plans are developed in a detailed form with regulators and stakeholders post consent, but prior to deployment / construction.

120. The applicant is committed to the ongoing development of the Outline EMMP post consent, until a Detailed EMMP is agreed by the Advisory Group and approved by Regulators.

121. The project team has consulted with NRW and RSPB throughout the EIA assessment process and development of the Outline EMMP, both pre and post submission. This engagement continues, and NRW has recently provided advice for inclusion in the Outline EMMP to ensure a conclusion of no AEOSI for marine mammals and migratory fish.

122. The EMMP will include, in full, NRW's recommendations made in MMC445 Advice on adaptive management of the risk of collision impacts on protected marine mammal species in Welsh waters from the Morlais Project.

123. The Outline EMMP continues to be actively developed in order to ensure significant adverse impacts on marine mammals, diving seabirds or migratory fish.

124. The Outline EMMP demonstrates the Applicant's commitment to the ongoing management of Morlais in a way that avoids potentially significant environmental impacts on marine mammals and seabirds. It proposes aims, objectives, monitoring methods and mitigation measures.

125. The Outline EMMP will be revised and agreed in a Detailed EMMP post consent, using the most up to date knowledge and understanding at that time.

126. The Detailed EMMP will be used to ensure adequate and effective mitigation and monitoring for marine mammals, which will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.

127. The ERM and CRM modelling work undertaken for marine mammals and for seabirds, has been updated to address an error identified in one part of the calculation. The updates have been provided as clarifications and make no change to either the indicative maximum scale of deployment of Morlais' first phase, or to the approach to management and mitigation of Morlais proposed in the Outline EMMP.

128. A phased approach to deployment of Morlais is proposed, with no deployment at any scale (MW or number of devices) with potential to have a significant effect on marine mammals, seabirds or migratory fish.

129. The EMMP will use appropriate methods to monitor the behaviour of and take appropriate mitigation to avoid, significant impacts on marine mammals, diving seabirds and migratory fish.

130. The creation of an 'Advisory Group' with an independent chair, to manage and oversee the operation of the EMMP is proposed.

131. NRW's membership of an Advisory Group or equivalent body is recommended within NRW's current advice on adaptive management for marine developments (Natural Resources Wales, 'Using adaptive management for marine developments - Guidance for marine developers', 2020).

132. The requirement for development of a Detailed EMMP will be included within conditions under the Transport and Works Act Order, and Marine Licence.

133. The Detailed EMMP will be a 'living' document, and It is proposed that detailed management of the EMMP is conditioned through the Marine Licence, to allow for adaptive management changes to the EMMP over time.

## 8.2 Benthic Ecology

134. Responses to NRW and North Wales Wildlife Trust (NWWT) Statements of Case comments on Benthic Ecology are provided in Appendix 2.

135. The benthic survey and seabed mapping undertaken for Morlais was sufficient for EIA purposes.

136. Annex 1 Habitat impacts have been assessed in a highly precautionary way, leading to a greater level of predicted impact than is realistically expected.

137. Pre-construction surveys will allow micro-siting of seabed infrastructure to limit the significance of any impacts on Annex 1 habitats.

## 8.3 Migratory Fish

138. Potential mechanisms for AEOSI have been assessed, and the potential for barrier to migratory routes as a result of collision was identified as a potential pathway for such impacts.

139. There is uncertainty regarding the behaviour of migratory fish around tidal devices, however, the limited available data suggests that the potential for such impacts is low.

140. In recognition of the uncertainty identified, the applicant is committed to undertaking monitoring work targeted at addressing those uncertainties as part of the EMMP.

141. This approach will allow a conclusion of no AEOSI to be reached, with that conclusion confirmed as a result of monitoring.

# Appendix 1 – Responses to Outline EMMP in NRW and RSPB Statements of Case

### Table A 1 – EMMP related responses to NRW Statement of Case – Outline EMMP

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 14 | *"The proposal has the potential to have an adverse impact on marine mammal species listed in Annex II and Annex IV of the Habitats Directive. The proposal would be situated within the North Anglesey Marine Special Area of Conservation (SAC) which is designated for harbour porpoise and it could also affect other species of marine mammals, including those with demonstrated connectivity to other SACs."* | As outlined in the marine mammal PoE and in Section 5.5 of this EMMP PoE, there is a commitment from the applicant to ensure adequate and effective mitigation and monitoring for marine mammals, which will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.<br><br>The MDZ was identified and agreed prior to designation of the North Anglesey Marine SAC.<br><br>Advice has been provided by NRW (NRW 2020) as to the commitments required within the Outline EMMP, to ensure no AEOSI. These requirements will be incorporated in the Outline EMMP in full. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 15 | *"NRW considers that the risk of marine mammal mortality from collisions with operational tidal devices is unacceptably high. Due to the existing impact of human activity e.g. bycatch from fishing, uncertain population estimates and small, declining populations, NRW will argue that it is not possible to rule out an adverse effect on site integrity (AEOSI) and/or significant impacts on these populations from the predicted project mortality levels."* | As outlined in the marine mammal PoE and in Section 5.5 of this EMMP PoE, there is a commitment from the applicant to ensure adequate and effective mitigation and monitoring for marine mammals, which will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.<br><br>Advice has been provided by NRW (NRW 2020), as to the commitments required within the Outline EMMP, to ensure no AEOSI. These requirements will be incorporated in the Outline EMMP in full. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 16 | *"The applicant has presented an indicative first phase of deployment from calculating the maximum number of devices and megawattage (MW) for each device type that could be deployed with a collision risk below 0.7 bottlenose dolphin per year assuming an avoidance rate of 98%. NRW will argue that the assessment places an over-reliance on the outputs of the quantitative predictive collision risk modelling with very little appreciation of the uncertainties inherent in this approach. There* | A detailed response is provided in Section 6 of the Marine Mammals POE.<br><br>As outlined in Section 5.5 of this EMMP PoE, the applicant is committed to ensuring adequate and effective mitigation and monitoring for marine mammals, which will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.<br><br>The EMMP will be developed alongside the detailed design of the project, in |

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| | | | *remains a significant risk that unsustainable mortality of Annex II and IV marine mammal species could occur from the first phase alone (and that AEOSI cannot therefore be ruled out), and a precautionary reduction in scale of the first phase would reduce this risk".* | consultation with NRW to ensure no population level effects or AEOSI of designated sites where marine mammals are a qualifying feature. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 17 | *"The applicant proposes to implement an Environmental Monitoring and Mitigation Plan (EMMP) as part of an adaptive management approach. Whilst NRW does not object in principle to an adaptive management approach, NRW will argue that further information and commitment is required to demonstrate that adaptive management can be justified in this case and that the proposed monitoring and mitigation will be deliverable and effective in avoiding significant impacts and AEOSI.*<br>*For example:*<br>*• How would real-time monitoring of marine mammal movements and a rapid response to any detected collisions be achieved? Several monitoring and mitigation options are described, but evidence of their effectiveness for the range of device types proposed, and in relation to all species, is limited.*<br>*• There needs to be a commitment not to operate devices until it has been demonstrated and agreed in writing that marine mammal movements and collisions can be detected.*<br>*• There needs to be a clear commitment to cease operation should collisions reach a pre-agreed limit."* | As outlined in the marine mammal PoE and in Section 5.5 of this EMMP PoE, there is a commitment from the applicant to ensure adequate and effective mitigation and monitoring for marine mammals, which will be implemented through the EMMP and legally secured through a consent condition, to ensure no AEOSI for any SAC with harbour porpoise, bottlenose dolphin, grey seal or harbour seal as designated features.<br><br>Development of the EMMP post-consent and prior to deployment will allow the latest information and technology to be used to ensure no risk in real time of animals colliding with the devices and an adverse effect occurring.<br><br>Advice has been provided by NRW (NRW 2020) as to the commitments required within the Outline EMMP, to ensure no AEOSI. These requirements will be incorporated in the Outline EMMP in full.<br><br>The requirements of the EMMP will be secured in the TWAO and Marine Licence consent conditions. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 18 | "*The assessment of whether the operational tidal devices would generate underwater noise causing disturbance to marine mammals is deficient. In particular, there are aspects of the underwater noise modelling which are not adequately explained, and which do not appear to consider the full complexity of the project design envelope (PDE). For example:*<br>*The source of the operational noise characteristics for the noise modelling is not identified or adequately explained.*<br>*• The assumption that the sound level of a large rotor device can be obtained by scaling up from a small rotor device has not been demonstrated to be sound.*<br>*• It has not been explained how the sound emanating from a single rotor is extrapolated to an array of* | Further detail is provided in the Marine Mammals PoE.<br><br>Underwater noise modelling will be conducted when information is available on types of devices and noise levels, number of devices, array layout, etc. This is expected to form part of the detailed EMMP (as discussed in Section 5.5 of this PoE), and if assessments indicate the potential for any significant disturbance from device type this will be reviewed as part of the EMMP process.<br><br>Potentially 'noisy' tidal devices will not be deployed if there is unacceptable risk of adverse effects. |

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| | | | *120 or 620 devices for the large and small rotor turbines respectively.*<br>*• It has not been explained how the use of two noise levels from a small and large rotor source adequately considers the multiple different device types within the PDE.*<br>*• No estimate is given of what the maximum noise disturbance range would be for an array of either small or large turbine. However, the noise model plots appear to show that it could range to approximately 17km from the centre of the array. Continuous noise disturbance at this range could potentially cause AEOSI on North Anglesey Marine SAC for the duration of the project operation.*" | |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Marine Mammals<br>Paragraph 19 | "*The applicant proposes to use Acoustic Deterrent Devices (ADDs) as possible mitigation to deter marine mammals from colliding with the turbines. NRW will argue that the potential disturbance from ADDs has not been adequately assessed, for example:*<br>*• There is strong evidence to support the use of considerably larger noise ranges.*<br>*• The noise modelling is based on a single ADD, but the applicant has suggested deployment of an array of up to 40 ADDs. There is no assessment of how disturbance from a single device might be extrapolated across the array.*<br>*• There is no information on how the ADDs will be configured in an array, and it is unclear how they might be triggered (and therefore how often and for how long they will cause disturbance on each occasion).*" | A detailed response on the use of ADDs is provided in the Marine Mammals PoE.<br><br>Use of ADDs as part of an adaptive management approach to mitigation through the EMMP is discussed in section 5.8 of this PoE.<br><br>Developing the detailed EMMP pre-construction will allow the latest technology and information to be taken into account, including lessons learned from other projects and how to develop the most effective deployment of ADDs for Morlais, to allow for the types and layout of the tidal devices for each phase of deployment. |

## Table A 2 – EMMP Responses to RSPB Statement of Case - OEMMP

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Mitigation and Monitoring<br>Paragraph 52 | *The Applicant has provided some information as to potential monitoring and mitigation plans. However, there are now 4 versions of the Ecological Monitoring and Mitigation Plan (EMMP)*<br>*(please note that confusingly the 4th version is numbered (03)). The first version was submitted* | Development of the outline EMMP has continued after submission, in order to capture the comments from RSPB and NRW. This has resulted in several versions as the document has evolved. |

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| | | | *alongside the ES in 20196. At that stage the Environmental Statement was jointly produced for both the TWAO and Marine Licence applications* | |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Mitigation and Monitoring<br>Paragraph 53 | *Since then a revised version dated 25 March 2020 was submitted again for both the TWAO and Marine Licence applications. However, the two further updates to this important plan first in May and then in July of this year have only been submitted to NRW for consideration with Marine Licence Applications.* | Development of the outline EMMP has continued after submission, in order to capture the comments from RSPB and NRW. This has resulted in several versions as the document has evolved.<br><br>NRW consulted with RSPB on the revised plan. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Mitigation and Monitoring<br>Paragraph 54 | *The RSPB wishes to highlight at the start of this section that no satisfactory answer has been provided as to why there is not just one EMMP covering the whole project and strongly recommends that the latest version of the draft EMMP is required as a condition for both the TWAO and the Marine Licence.* | The EMMP is a living document and one EMMP will apply to the whole project.<br><br>Conditions relating to implementation of the EMMP may require evolution over time. Measures under the TWAO cannot be revised without a new order, while Marine Licence conditions can be revised via a simpler process. For this reason, the Marine Licence is proposed as the mechanism to manage the EMMP.<br><br>The requirement for an EMMP will be captured under both TWAO and ML.<br><br>The Order will require submission of an EMMP prior to each of the following activities:<br>- the commencement of any tidal works; and<br>- the repowering of any tidal works<br><br>The term 'commencement' is defined to comprise any material operation onshore or offshore but does exclude some works.<br><br>The requirement to submit a single EMMP for approval pursuant to the Order can be contrasted to the requirement to submit an updated navigational risk assessment prior to the construction maintenance repowering or decommissioning of a tidal device, and the requirement for DPP submission prior to deployment of tidal devices in specified circumstances.<br><br>The Order therefore requires that an EMMP is submitted before the commencement of any tidal works, and its terms, including how it can evolve, will be approved by the Welsh Ministers (article 3(4)) and the Order |

| Reference | Document | Section | SoC Comment | Response |
|---|---|---|---|---|
| | | | | also secures implementation (article 3(6)). The Marine Licence can secure further detail as to the management of the EMMP process, through Phased deployment and repowering. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Mitigation and Monitoring<br>Paragraph 55 | *Despite the updated versions, the detail provided is still limited.* | The plan is in outline form. Detail will continue to be limited until detail of technology and location of phase 1 is known post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | The First EMMP<br>Paragraph 56 | *While the RSPB welcomed the initial EMMP, we noted that in it there was scant detail provided as to how the proposed collision and avoidance monitoring scheme would work. It merely stated that monitoring would provide data allowing for a recalculation of the correction factor for the collision risk modelling process, ("Avoidance Rate", as discussed above), and according to the Applicant this recalculation would result in the revised impact predictions being negligible.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | The First EMMP<br>Paragraph 57 | *It is important to highlight that there is no precedent for existing technology that is capable of carrying out such monitoring and it will be extremely difficult to develop. Lessons can be learned from the offshore wind industry where there has been a concerted effort to improve the evidence base underpinning Avoidance Rates for collision models. This effort was initially brought about by an analysis carried out by Chamberlain et al., (2006) 7 to examine the sensitivity of the outputs of the Band Collision Risk Model to variation in the input parameters, including Avoidance Rates. This showed that the Avoidance Rate used had an overwhelming influence over the predicted mortalities, and so there was a focus on improvement on estimates of this rate. However, a review (Cook et al., 2012) carried out under the Strategic Ornithology Support Services project found that there was insufficient evidence to determine a revised Avoidance Rate.* | The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>The examples used by RSPB relate to offshore wind.<br><br>The problems involved in determining avoidance rates are recognised, and this will be recognised in the further development of the Outline EMMP. However, gaining insight into some elements of avoidance behaviour would be tractable (e.g. macro-avoidance of the development site), whilst monitoring will provide data on other key input parameters of the ERM and CRM. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate | The First EMMP<br>Paragraph 59 | *Subsequently, under the direction of Offshore Renewables Joint Industry Partnership (ORJIP), a Bird Collision Avoidance study was designed, with the specific aim of defining Avoidance Rates* | The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and |

| Reference | Document | Section | SoC Comment | Response |
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| | Reference:<br>DNS/3234121 | | *for a number of bird species (Skov et al., 2018)9. This multimillion-pound study was commissioned by eleven offshore wind developers, The Crown Estate, The Crown Estate Scotland and Marine Scotland, and supported with funding from the UK Government. The work was undertaken at the Thanet Offshore Wind Farm, UK between July 2014 and June 2016. However, because of difficulties extrapolating the calculated avoidance rates onto other wind farms, and problems with how avoidance rates are expressed to include variability, uncertainty and model error (Bowgen and Cook, 2018)10, the calculated "empirical" Avoidance Rates have not been accepted for use in subsequent wind farm applications, and a subsequent study, using similar technology has been commissioned by the European Offshore Wind Deployment Centre*<br><br>*(EOWDC) and has just begun to make a further attempt at answering questions around bird avoidance behaviour and collisions.* | academia, through the mechanism of the EMMP.<br><br>The examples used by RSPB relate to offshore wind and not tidal stream. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | The First EMMP<br>Paragraph 59 | *Clearly it is considerably easier to monitor collisions and bird behaviour above the surface of the water, but as these cases indicate there are considerable difficulties in determining avoidance rates, even with widespread support and large amounts of investment. The development of technologies to carry out similar monitoring in the sub-surface environment is still in its infancy. A recent review of video monitoring of tidal devices highlighted the difficulty in monitoring interactions with devises and that there was no technology that could identify the avian species involved in the interaction to the species level, frequently being only able to record as "possible bird"11. As such, even if such technologies become available it is unclear whether they would be able to provide evidence of avoidance behaviour, as the attempts to do so for offshore wind developments show. Therefore, the Applicant's advocacy of mitigation by monitoring avoidance behaviour is not only lacking in any detail but is very likely to be unachievable.* | The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>The outline EMMP identifies several potential monitoring methods which may be used to collect data pertinent to agreed monitoring requirements. It is unlikely that one method, for example video, will be deployed singly, and more likely that a combination of methods, for example, video, active sonar, tag-based tracking and possibly visual observations may be used. |

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| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | The Second EMMP<br>Paragraph 60 | *A second revised EMMP was provided to the RSPB on 25th March 2020. While the RSPB welcomed more being provided the monitoring section of the plan remained very scant in detail with the onus being placed on an advisory group to provide more detailed methodology proposals.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The role of the Advisory Group is to agree approach and methods appropriate to the most up to date technologies and scientific understanding at the time of deployment. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | The Second EMMP<br>Paragraph 61 | *While the role of an advisory group is to be welcomed, little thought has been put into the fundamental feasibility of the suggested approaches and whether they will be able to provide answers to the important questions inherent in a novel technology. As considerable uncertainty exists around the effects of these devices, it is crucial that the monitoring methods are more clearly delineated, with evidence that they will be possible and effective, before any consent is granted.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>The methods and approaches to monitoring described in the EMMP have been considered for or applied to equivalent projects. The EMMP will require efficacy to be considered before their deployment. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | The Second EMMP<br>Paragraph 62 | *The RSPB's concerns are detailed below under the following headings:*<br>*• Colony counts*<br>*• GPS tagging*<br>*o Species*<br>*o Tag technology*<br>*o Capture methods*<br>*o Data retrieval*<br>*o Timing of study*<br>*o Collision monitoring*<br>*o Baseline* | Noted. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Colony Counts<br>Paragraph 63 | *Colony counts*<br>*The EMMP suggests colony counts as a mean of determining the numbers of birds "active within the colonies of interest". Such counts are a fundamental component of any monitoring scheme and so the inclusion is welcomed. However, a more detailed approach of enhanced monitoring, rather than simple counts, is required to capture any sub-lethal impacts of the devices, such as displacement or changes in prey availability. Enhanced monitoring of seabird productivity and population size based at monitoring plots should be conducted on the key seabird species annually from early April to the end of August. Monitoring should closely follow the JNCC* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>Further discussions on the subject of colony counts were held with RSPB during the meeting of 04/08/2020. The Project is broadly supportive of RSPB's suggestions regarding colony counts and productivity, and (as detailed in Section 6 of the Ornithology Proof of Evidence) can commit to developing, in conjunction with RSPB and NRW, a programme of colony counts and productivity monitoring<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. |

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| | | | *Seabird Monitoring Handbook12 but be conducted at an increased frequency (i.e. when required multiple visits per week) to the regular monitoring conducted within the colonies to ensure egg-laying, hatching, fledging and possibly nest failure dates can be derived from the data as accurately as possible. The enhanced monitoring plan should be drawn up, in consultation with any site wardens following preliminary site visits. These discussions and visits should tailor the monitoring to the specific logistical considerations of each site including topography, location of nests and existing work and monitoring plans. An absolute minimum of two years pre-construction monitoring data is required to capture the natural demographic variability.* | It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Colony Counts<br>Paragraph 64 | *As well as ensuring a baseline demographic data set any EMMP must include an analysis of the power to detect change. This power analysis will determine the sample size and frequency of monitoring required to detect an impact of a given magnitude arising from the deployment of the tidal devices.* | The Detailed EMMP will be developed post consent and the colony count monitoring will be designed with account taken of the power to detect change as a result of Morlais.<br><br>Constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | GPS tagging<br>Paragraph 65 | *Tracking by fitting birds with GPS tags is suggested for "diving birds", without details provided as to which species will be tagged. We presume this refers to guillemot and razorbill, but it is unclear if Manx shearwater will also be included (they are known to dive to at least 55m13). It is critical that this information is provided as considerations such as capture method, tag type, attachment method, and data retrieval will differ depending on species and thereby understanding whether the approach is justified or not will be species specific* | It is not be the intention to include Manx shearwater in the EMMP at this time. The reason for this is that the MDZ does not make up a substantial proportion of the foraging grounds for this species, it does not breed at/near South Stack, and significant effects have not been predicted by the ES or HRA.<br><br>Constructive advice, such as that proposed is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Tag technology<br>Paragraph 66 | *In the EMMP, the data derived from these studies is said to provide "location, height, depth, speed and acceleration." However, only the first of these, location, is directly obtainable from GPS tags (flight height can be modelled from GPS data to some extent using a Baysian approach14, but this will not provide the location specific data required for monitoring). The rationale also claims that other relevant parameters "such as dive depths and durations" will be obtained. These parameters are also not obtainable from GPS tags.* | Constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. The type of tagging deployed and the associated technology will be reviewed post consent and closer to deployment to take full advantage of all developments in technology.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP. |

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| | | | | While GPS tags may not be able to currently collect all of the parameters detailed, this is expected to change over time, and currently other tag technologies can collect those other parameter data. The applicant wishes to be as open as possible to new developments of technology and understanding.<br><br>To monitor behaviour at the individual level, it is proposed to tag breeding guillemot and razorbill from the South Stack and Penlas colonies. Preliminary advice from RSPB indicates that approximately 15 individuals of each species could be caught and tagged each year, which would likely occur during the early chick rearing phase.<br><br>Two types of tag would be employed; Global Positioning System (GPS) tags, which measure the spatial location of the bird, and time depth recorders (TDR) tags, which provide data on diving behaviour (e.g. dive duration and depths). In both cases, birds must be caught in order for tags to be fitted. The tags would generally be designed to collect data for a period of several days, after which they would fall off. The aim would be to capture data using remote base stations installed at the colony, enabling automatic download to the base station when birds return to the colony after foraging trips.<br><br>Studies of the foraging behaviour of both guillemot and razorbill are being undertaken in other UK projects involving the combined use of GPS and TDR devices, and with automated data download incorporated. However, it is recognised that this is still novel technology, with the success of these systems still to be fully established, and further details of such work will be obtained before finalising the tagging methods.<br><br>The Project team have recently held discussions with key staff on the SEACAMS project, who have successfully tagged guillemots at Puffin Island with GPS tags and accelerometers. Further discussions are planned to ensure that all available options for the EMMP are thoroughly explored to enable the production of a high quality evidence base by the monitoring programme. |
| SOC004 | RSPB Statement of Case<br><br>Planning Inspectorate Reference:<br><br>DNS/3234121 | Tag technology<br><br>Paragraph 67 | *It is possible to obtain these data from other additional devices that can be used in addition to GPS tags, for example time depth recorders (TDR) or accelerometers. TDRs, which record dive parameters and accelerometers, which will provide accurate quantification of movement, can be integrated into* | See earlier response to Paragraph 66.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. The type of tagging deployed and the associated technology will be reviewed post consent and closer to deployment to take full advantage of all developments in technology. |

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| | | | *GPS tags and such devises have been fitted to both razorbill and guillemot15, although no tags as yet integrate all three sensors. It is unclear whether such methods will provide the data required for a comprehensive monitoring scheme, in particular in relation to data retrieval, capture methods and the limited period over which tracking can be carried out.* | The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Capture Methods<br>Paragraph 68 | *All tagging studies require capture of the individual being tagged. As such, consideration is needed in determining capture method to minimise the potential negative impacts of the capture on the bird being studied, both for ethical reasons and to prevent altering the behaviour of the study bird. It is also crucial to consider the safety of the people capturing the birds. These considerations are especially pertinent with cliff nesting species such as razorbill and guillemot, as the risks of injury or causing nest failure are high. Before any work is carried out it is important that a feasibility study is carried out, to determine the accessibility and safety of catching (and potentially recapturing) the birds as this will be very site specific. None of the versions of the EMMP contain such details. The feasibility study should be carried out and fed into the EMMP rather than leaving its important results for later especially if some methods are not feasible and alternatives required, with the consequence of delays to the start of the pre-construction monitoring.* | See earlier response to Paragraph 66<br><br>The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent.<br><br>Feasibility of all methods will be reviewed post consent, as detailed in the outline EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Data retrieval<br>Paragraph 69 | *No detail has been provided in the EMMP as to how the data collected by the tags will be retrieved. Essentially there are two methods, in situ or remote downloading. In situ retrieval requires recapture of the bird and removal of the tags, while remote retrieval can be via, for example, satellite, GSM network or using a base station. Satellite and GSM tags are currently too heavy to be used on auk species, including guillemot and razorbill, so the only suitable methods for data retrieval are by using a base station or by recapturing the bird. Careful, site specific consideration is required as recapture carries similar risks to capture, with the added complication that a bird is much harder to recapture than it is to capture.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent.<br><br>Feasibility of all methods will be reviewed post consent, as detailed in the outline EMMP. |

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| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Data retrieval<br>Paragraph 70 | *The use of a base station requires knowledge of the local topography as the station needs to be located in line of sight of the birds' nest in order that data can be downloaded while the bird is on the nest. Clearly such considerations must be made before the monitoring plan can be finalised. And as mentioned above we are concerned that this information is not currently available.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Timing of study<br>Paragraph 71 | *Currently for razorbill and guillemot, capture methods are largely restricted to a narrow window in the breeding season, early to mid chick-rearing period. Capture of these species should not be undertaken during incubation because of the risk of dislodging the egg. Late chick-rearing period should also be avoided because the chicks are mobile and can potentially move away from the nest site and be at risk as a result. Such phenological constraints mean that any data collected cannot be representative of the whole year and will not include periods when the birds are vulnerable, such as for razorbill and guillemot, post moult. The EMMP should account for these limitations and explore any means by which they can be overcome.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Collision monitoring<br>Paragraph 72 | *The EMMP lists collision of diving birds with tidal devices as one of the indicators to form part of the monitoring scheme examined via tagging. However, there are no suitable tags available that will provide this information. The reason for this is that, as noted above, data from the tags needs to be downloaded and it is impossible to do this unless the tags itself is retrieved from the collision victim. As the only method of remote downloading suitable for these species requires the bird to return to the colony, it is impossible for a fatal collision to be recorded. For non-lethal encounters, the bird may abandon the breeding attempt, in which case it also may not return to the colony. It should be noted, therefore, that there is no means of recording collision of diving birds with tidal devices included in the EMMP, and as detailed in our previous written submission, there is little practical chance of the* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Tagging methods are unlikely to be used in isolation.<br><br>Work undertaken by Marine Scotland has shown that active sonar currently used to detect marine mammals is also able to detect diving seabirds, and such active sonar. The use of video may also be indicated, as well as other visual methods if location of the device array allows. |

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| | | | *development of device mounted sensor capable of recording bird collisions.* | |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Baseline Paragraph 73 | *The EMMP suggest that tracking data will be used to monitor any "change in use of tidal device deployment area pre and post installation". However, the outline schedule of EMMP tasks shows that the monitoring work will only commence after construction has begun, so it is impossible for any change in behaviour due to the presence of the tidal devices to be described. As mentioned above, an absolute minimum of two years pre-construction monitoring data is required to capture the natural spatial variability in at sea distribution. Such variability can arise as a result of, for example fluctuations in prey density, and so a robust baseline is needed in order to disentangle such biological stochasticity from the effects of the devices.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition. Further details of the monitoring approach and methods will be progressed post-consent in consultation with NRW and RSPB.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Baseline Paragraph 74 | *As well as ensuring a baseline spatial data set any EMMP must include an analysis of the power to detect change. This power analysis will determine the sample size and frequency required to detect an impact of a given magnitude arising from the deployment of the tidal devices* | Noted, further details of the monitoring approach and methods will be progressed post-consent in consultation with NRW and RSPB.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | The Fourth EMMP Paragraph 75 | *Whilst we welcome the fourth version of the outline EMMP and the further detail it contains on the use of trigger points and monitoring requirements, including measures which are now incorporated re the stopping or removal of tidal devices if monitoring indicates adverse effects. We continue to have concerns on a number of aspects.* | Noted. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | The Fourth EMMP Paragraph 76 | *First, for further legal certainty we think the proposed phased approach needs to be included within both consent documents namely the TWAO and the Marine Licence. Currently as discussed above this revised EMMP is only being suggested for the Marine Licence even though no justification has been provided as to why.* | Noted.<br><br>See earlier response.<br><br>The Outline EMMP has been submitted to both applications and is a condition of both the draft TWAO and Marine Licence. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | The Fourth EMMP Paragraph 77 | *Second, although the further work undertaken on identifying potential monitoring methods has been presented, there is still insufficient information on how the methods will be developed and applied.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improving the evidence base to allow the development of tidal stream energy through the collection of suitable data. |

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| | | | | It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | The Fourth EMMP<br>Paragraph 78 | *Therefore, as mentioned above, we welcome the inclusion of a Phased approach to the deployment of devices within the EMMP. However due to many remaining areas of uncertainty, to ensure that this Phased approach adequately addresses the principles of adaptive management enshrined in NRW's guidance we would like to see the phases tied more directly to monitoring methods and technology that encapsulate both potential population and collision impacts on birds, focusing on razorbills and guillemots.* | Noted.<br><br>The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Proposed adaptive management approach<br>Paragraph 79 | *The RSPB contends that further work needs to be undertaken on identifying potential monitoring methods which the Applicant is currently proposing as there is insufficient information and evidence on how these methods will be developed and applied (as discussed in detail above). It is important to note that the technology proposed by the Applicant both does not currently exist in a form that can be readily and easily used and what technology does exist at present is too imprecise and problematic logistically to be of use. Also in the RSPB's view the data proposed to be collected, does not establish the impact of the technology on the bird colonies or the risk of collision.* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The Applicant considers that there is considerable potential for valuable monitoring to be undertaken which will enable refinement of collision estimation and inform the likely effects of the initial deployment (and potential increases in the extent of deployment) on the breeding guillemot and razorbill populations at the South stack and Penlas colonies.<br><br>Whilst uncertainty exists over some of the potential approaches and methods, others are clearly viable. This provides the foundations from which further progress on the monitoring approach and methods can be made post-consent in consultation with NRW and RSPB.<br><br>The applicant is committed to improve the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Feasibility of all methods will be reviewed post consent, as discussed in the outline EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Proposed adaptive management approach<br>Paragraph 80 | *The RSPB fully supports the vital monitoring and research that is proposed, if achievable, as it would increase our understanding of how seabirds interact with, and are impacted by, tidal devices. The evidence that could be gathered, if this proposal was to go ahead would provide* | The plan is in outline and its purpose is to demonstrate commitment to the approach detailed and agreement to enforcement through consent condition.<br><br>The applicant is committed to improving the evidence base to allow the development of tidal stream energy through the collection of suitable data. It is proposed that this is done in |

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| | | | *much needed clarity on how, and if, this technology can be deployed, increasing certainty for developers and investors whilst ensuring that both nature and the environment is protected. However, as mentioned above the necessary monitoring techniques being in their infancy, further development and testing is required before they can be relied upon to form the basis of an Adaptive Management Agreement.* | partnership with regulators, RSPB and academia, through the mechanism of the EMMP.<br><br>Such constructive advice is welcomed and will be essential to the development of a detailed EMMP post consent.<br><br>Feasibility of all methods will be reviewed post consent, as detailed in the outline EMMP. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Proposed adaptive management approach<br>Paragraph 81 | *Whilst the EMMP, as submitted for the TWAO application, references the potential phasing of deployment, the very nature of this document means that it is a living document and therefore subject to continual revision. It is the potential for this Phasing, as outlined in the EMMP as currently drafted to be amended which is of major concern.* | Noted.<br><br>Mechanisms for agreement of Phasing are proposed in the Outline EMMP. Indicative levels are provided for illustrative purposes.<br><br>The phased deployment of tidal devices will be at a magnitude below levels that could result in significant population level effects on seabirds.<br><br>The Advisory Group will agree the scale of all Phases of deployment, subject to approval by regulators. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Proposed adaptive management approach<br>Paragraph 82 | *We believe that in order for Adaptive Management principles to be comprehensively assessed at each Phase, those Phases need to be legally binding by way of a Schedule within the Order or as a minimum, enshrined within a condition. This would ensure that Phases are specific, limited and immoveable in nature to prevent the creep of deployment without due scrutiny and confirmation that actual and potential impacts are not of an unacceptable level.* | The applicant proposes that the Phasing is agreed through the EMMP, using the most up to date information to make an informed decision. The requirement for an EMMP enshrined by the TWAO, and the detailed management of it through Marine Licence condition will allow regulators the ability to ensure ability to deploy each phase is scrutinised and no potential for significant adverse impact is allowed. |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Proposed adaptive management approach<br>Paragraph 83 | *The need for the EMMP to be a living document is widely accepted as a vehicle to deliver adaptive management in novel developments, however we strongly recommend that the failsafe, protective measures contained within the latest version to prevent significant impacts on wildlife and the environment need to be legally binding and applicable to both consents.* | The outline EMMP proposes that final agreement of all management measures is managed directly by regulators. It is difficult to see what better failsafe is possible?<br><br>As noted above the Order secures that the EMMP must be submitted to and approved by the Welsh Ministers before commencement of any tidal works, and that it must be implemented, including any proposed management measures, as approved |
| SOC004 | RSPB Statement of Case<br>Planning Inspectorate Reference: DNS/3234121 | Proposed adaptive management approach<br>Paragraph 84 | *Whilst not formally submitted to the TWAO application the latest EMMP submitted to the Marine Licence application does address some of our issues by way of inclusion of a 'Stop' clause and also a 'Removal' clause should an impact, significant or otherwise, be noted through agreed monitoring results. We would therefore welcome the* | Noted.<br><br>The adaptive management approach will be secured through a consent condition, such that no tidal devices may be constructed or repowered until a Detailed EMMP is agreed with NRW, supported by an Advisory Group of relevant stakeholders.<br><br>Adaptive management of the EMMP scan be afforded the adaptability |

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| | | | *following points to be included within the Order;* | necessary through Marine Licence condition management.<br><br>The requirement for EMMP is ensured via TWAO and ML.; article 3(4) requires its submission prior to the commencement of any tidal works by reference to Part 4 of Schedule 1. Article 3(7) provides that where an equivalent documents is approved pursuant to the conditions of a marine licence then this is deemed to be approval by the Welsh Ministers. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Mitigation<br><br>Paragraph 85 | *Mitigation to take several forms during the implementation of the EMMP to prevent significant impact on marine mammals and birds occurring. These routes should include, but not be limited to;*<br>*• Mitigation through Phased Deployment*<br>*Initial stages of deployment should be limited to a level of no discernible impact on sensitive receptors are predicted. Deployment should be limited and phased not only through initial deployment but for the life of the project up to full capacity. Each Phase of deployment needs to be monitored and mitigated for with agreement by all parties within the Advisory Group that a further Phased deployment is permitted.*<br><br>*• Mitigation through Corrective Measures – Stopping or Removal of Devices*<br>*Should an impact occur at any stage, the temporary and / or permanent stopping or removal of the deployed tidal devices needs to be undertaken in a timely and agreed manner with all parties within the Advisory Group.* | Noted.<br><br>While the Advisory Group will recommend management, monitoring and mitigation measures within the EMMP, the final agreement of all such measures is the role of the regulators.<br><br>The phased deployment of tidal devices at a magnitude below levels that could result in significant population level effects on seabirds provides an opportunity to provide information which could be used to improve the modelling of collision risk from multiple devices, and further test and develop technologies to determine if a collision event occurred.<br><br>In terms of the phasing of the deployment, the details of the Phase 1 deployment will be developed post consent. This is necessary as the number of devices and capacity of the array is subject to the type of device(s) to be deployed and their associated collision risk.<br><br>Phasing of the device deployments will only be allowed at scales at which Regulators agree that the best available scientific understanding does not predict adverse effects upon marine mammals or diving seabirds. Phase 1 will be installed at a capacity (MW) at which no significant impact is predicted on marine mammals or diving birds using the MDZ. This commitment ensures an initial level of mitigation in place at the start of the EMMP through the limitation of the scale of the development. Further details of the proposed approach to phasing are provided in the OEMMP (MDZ/A10)<br><br>Adaptive management of the EMMP is afforded the adaptability necessary for implementation through Marine Licence condition management.<br><br>The requirement for EMMP can be ensured via TWAO and ML. |
| SOC004 | RSPB Statement of Case | Mitigation | *The RSPB will show that it is necessary for the mitigations the applicant has submitted to the* | Adaptive management of the EMMP scan be afforded the adaptability |

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| | Planning Inspectorate Reference: DNS/3234121 | Paragraph 86 | *Marine Licence application to be incorporated and built up on within the TWAO to be legally binding and enforceable* | possible through Marine Licence condition management.<br><br>The requirement for EMMP can be ensured via TWAO and ML. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br><br>Paragraph 87 | *We welcome the Applicant's reference within the EMMP for a phased deployment of the tidal arrays linked to the mitigation, monitoring and measurable outcomes of the DEMMP to be overseen by the Regulators and Advisory Group. However, for this to be enforceable both by way of the TWAO and Marine Licence this phased approach needs to be present within the Order and the Licence (if approved) as both grant permission.* | Noted.<br><br>Adaptive management of the EMMP scan be afforded the adaptability possible through Marine Licence condition management.<br><br>The requirement for EMMP can be ensured via TWAO and ML. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br><br>Paragraph 88 | *The indictive phases (as set out in the EMMP for the Marine Licence (version dated July 2020) are welcomed in principle by the RSPB however we contend that at this consenting stage greater clarity needs to be given to the number and capacity of arrays envisaged as being deployed at each phase.* | The phasing example provided is indicative and illustrative.<br><br>We do not wish the number of phases to be in any way prejudged as either too many or too few. The EMMP is the appropriate mechanism for determination of appropriate phasing. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br><br>Paragraph 89 | *Whilst we recognise the need for flexibility in Phase 1 deployment and, to a point, accept that Phase 1 will be installed at a capacity that has no significant impact, the range of devices between 5 to 28 (6 –12MW) when the type of array to be used is unclear in addition to our concerns about the monitoring technology, needs to be tightened in scope.* | The phasing example provided is indicative and illustrative.<br><br>It is unclear what is meant by "to a point".<br><br>We do not wish the number of phases to be in any way prejudged as either too many or too few. The EMMP is the appropriate mechanism for determination of appropriate phasing |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br><br>Paragraph 90 | *This tightening of the scope of each Phase is essential in the early stages especially as the EMMP states that for Phase 2; "An example of a commercial level of deployment for a second phase of deployment is suggested in the ES, Chapter 25, Socio-economics, Tourism and Recreation as 40MW"* | The phasing example provided is indicative and illustrative.<br><br>We do not wish the number of phases to be in any way prejudged as either too many or too few. The EMMP is the appropriate mechanism for determination of appropriate phasing. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br><br>Paragraph 91 | *We contend that 4 Phases of deployment of novel technology with no confirmation of monitoring technology at consenting stage is too few Phases. This is especially concerning given the applicants statement within Phase 3 of the Phasing Deployment Strategy within the EMMP states that;*<br><br>*"If the monitoring and mitigation requirements are still required these would continue. Note it is the Applicants intention to remove monitoring and mitigation requirements as soon as it is* | The phasing example provided is indicative and illustrative.<br><br>We do not wish the number of phases to be in any way prejudged as either too many or too few. The EMMP is the appropriate mechanism for determination of appropriate phasing. |

| Reference | Document | Section | SoC Comment | Response |
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| | | | *possible to do so."* | |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br>Paragraph 92 | *From Phase 3 of up to 100MW to Phase 4 full deployment of 240MW is a large uplift in potential number and increase in area of deployment and as such monitoring and mitigation needs to be maintained and the impact of full commercial deployment assessed.* | The phasing example provided is indicative and illustrative. |
| SOC004 | RSPB Statement of Case Planning Inspectorate Reference: DNS/3234121 | Phasing of deployment<br>Paragraph 93 | *Indeed we contend that it is necessary, as a Demonstration Zone to test the commercial viability of this novel technology, the monitoring and mitigation of impacts needs to be maintained for the life of the project or until long term potential impacts on birds and mammals have been adequately assessed as agreed by the Advisory Group.* | Noted. |
| | | | | |

# Appendix 2 – Responses to benthic ecology issues raised in NRW and North Wales Wildlife Trust Statements of Case

### Table A 3 Responses to NRW Statement of Case – Benthic Ecology

| Reference | Document | Section | SoC Comment | Response |
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| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Benthic and intertidal habitats<br>Paragraph 28 | *NRW considers that the habitat characterisation surveys undertaken to inform the ES are inadequate to enable accurate assessment of the potential effects on marine benthic ecology. Therefore, it is not possible to assess with any certainty the full extent of potential marine benthic habitat loss and/or alteration as a result of the proposal. Furthermore, there is high uncertainty over the validity of proposed mitigation measures (i.e. micro-siting) to avoid loss and alteration of sensitive habitats as this information has not been accurately presented in the ES.* | The objectives and methodologies of the 2018 EIA characterisation survey were discussed further in a call with NRW on benthic issues on 9th of October 2020.<br><br>The 2018 survey was not intended to provide a formal baseline but to characterise the site to enable EIA to be undertaken. A standard approach was taken, and in line with EIA characterisation surveys undertaken for other marine energy projects, including Perpetuus Tidal Energy Centre (PTEC), Gywnt y Mor Offshore Wind Farm (OWF) and Burbo Bank Extension OWF.<br><br>NRW reiterated their concerns over the number of failed grabs and the small number of DDV ground-truthing locations (42 stations).<br><br>The applicant clarified that 42 ground-truthing stations were sampled but that this number was judged by the experienced survey contractor (Ocean Ecology Limited (OEL) ) to be sufficient to identify the spatial distribution of all seabed habitats and to characterise the site sufficiently for EIA purposes.<br><br>The number and location of these ground truth stations was based on the following:<br>(a) an initial diamond grid of stations based on relevant guidance documents;<br>(b) revision of this original grid following an initial interpretation of side-scan sonar (SSS) and multibeam echosounder (MBES) backscatter data that existed in this region. These revisions resulted in additional stations being added and located at potential transitions between substrates, at key areas of development (along the cable corridor and Abraham's Bosom), and within a 1 km buffer zone up- and down-stream of the development; and<br>(c) further review of updated SSS and MBES backscatter data collected in the first phase of the 2018 survey (Partrac, 2018) to sense check the proposed survey design.<br><br>From the 42 stations sampled, a total of 277 still images were collected along |

| Reference | Document | Section | SoC Comment | Response |
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| | | | | with over 220 minutes of video footage as shown in Figure A1.<br><br>Menter Mon confirms that micro-siting can and will be applied to all seabed project components, i.e. cables, tidal device foundations, anchors etc. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Benthic and intertidal habitats<br>Paragraph 29 | *Surveys confirmed that the subtidal environment within and surrounding the MDZ constitutes a complex assortment of subtidal biotope mosaics, including Annex I stony reef, biogenic reef and bedrock reef. These three habitats are protected under the Habitats Directive, the Environment (Wales) Act 2016, and the OSPAR Convention. NRW will argue that a lack of data on the distribution of these habitats within the MDZ means that it is not possible to assess accurately the full extent of potential habitat loss and/or alteration as a result of the proposal.* | The primary objective of the 2018 benthic/Annex I habitat survey was to characterise the site so that EIA could be undertaken.<br><br>To ensure a worst-case scenario assessment was presented within the Morlais ES, the areas identified as potential Annex I stony, biogenic and bedrock reef were grouped into two Valued Ecological Receptor (VER) categories; VER 9 - High energy infralittoral and circalittoral rock/ coarse sediment with Annex I stony/bedrock reef; and VER 10 (Circalittoral Sabellaria reefs – Annex I biogenic reefs).<br><br>The impact assessment undertaken assumed that all the subtidal habitat loss occurred within these 2 VER habitat groups (judged to be the most sensitive to habitat loss). Assumption of all loss in the 2 VER habitat groups is highly conservative but was adopted to purposefully avoid claims that the assessment was attempting to downplay potential impacts on those habitats. In practice, the actual loss of those habitat will be less than assessed by the EIA as some of the habitat loss will instead occur in non-Annex I habitats, i.e. non VER 9 / 10 habitats. |
| SOC008 | NRW Statement of Case<br>Planning Inspectorate Reference:<br>DNS/3234121 | Benthic and intertidal habitats<br>Paragraph 30 | *The applicant proposes that the baseline characterisation information would be supplemented by a post-consent/pre-construction Annex I reef survey and assessment. There is also an assumption that any outstanding issues, including a commitment to micro-site project infrastructure, would be dealt with via the marine licensing process. However, NRW will argue that it is not clear where micro-siting would be applied and whether it would be implemented for the tidal devices as well as the cable route.*<br><br>*The applicant states that: "micro-siting of the cable route would be used to mitigate impacts to these receptors where possible" and "It is important to note that the ability to micro site Tidal Energy Converters (TECs) is more limited than for Offshore Wind Farms (OWFs)".*<br><br>*Due to this limited scope to adjust the placement of the TECs and the potential scale of benthic habitat loss (c. 2.3km2) NRW will argue* | Menter Mon confirms that micro-siting can and will be applied to all seabed project components, i.e. cables, tidal device foundations, anchors etc.<br><br>NRW's point about inability to potentially avoid Annex I habitats, even with micro-siting applied, is noted and accepted. However, it is important to highlight that the amount of habitat loss presented in the ES was a precautionary (large) value, assuming maximum possible footprint that could result from use of gravity foundations and also included areas of seabed "swept" by the catenary of mooring chains, which are in reality likely to be affected to a much lesser degree.<br><br>The total habitat loss figure also assumes that the entire area ($m^2$) of gravity base foundations would lead to habitat loss, whereas the design of many gravity base foundations includes relatively small contact points with the seabed (to maximise grip / downward force at point of contact) and so, habitat loss is expected to be much lower.<br><br>Menter Mon makes the commitment that the need to potentially micro-site |

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| | | | *that, in the absence of detailed pre-consent habitat surveys, it is not possible to adequately assess whether this proposed mitigation would be feasible and effective in avoiding impact to the habitats of conservation importance identified.* | and/or reduce impacts on seabed habitats will drive the final design of TEC foundation options if required, to minimise benthic impacts.<br>Menter Mon will work closely with device developers to factor footprint into final foundation design for locations where impacts on sensitive habitats are predicted.<br><br>The Morlais project will be developed in a series of phases, enabling pre-construction survey data on the distribution and status of Annex I habitats to be collected prior to each deployment, further enabling micro-siting, where required.<br><br>Menter Mon notes NRW's comment that even with phased deployment and continued gathering of information on seabed habitats, the ability to mitigate through micro-siting may still be limited. In such cases additional mitigation may be required (and would be agreed pre-consent).<br><br>Through discussion at the 09.10.20 meeting, the potential role of biodiversity enhancement in the design of project components, in particular: TEC foundations; cable protection and anchor / mooring structures, was explored. Menter Mon will explore this approach with developers where required. The ongoing EcoStructures project http://www.ecostructureproject.eu was discussed as a source of information.<br><br>The applicant proposes the following wording to be captured in the draft Marine Licence conditions:<br><br>"Where it is not possible to avoid damage/loss of Annex I habitats via micro-siting, then further mitigation via biodiversity enhancement of seabed structures will be investigated and implemented in agreement with NRW". |
| SOC008 | NRW Statement of Case Planning Inspectorate Reference: DNS/3234121 | Benthic and intertidal habitats<br><br>Paragraph 31 | *NRW considers that undertaking additional pre-consent baseline characterisation surveys is required to understand better the location of potential sensitive habitats and the full extent of potential habitat loss and/or alteration as a result of the proposal. This additional survey work would provide a basis for more meaningful dialogue about feasible and sufficiently effective mitigation measures.* | The applicant does not consider that a pre-consent survey will change the conclusions of the ES.<br><br>The applicant is, however, committed to undertaking pre-construction surveys and has included such a condition in the draft Marine Licence conditions (see above). |
| SOC010 | North Wales Wildlife Trust | Introduction.<br><br>Benthic Ecology | *We remain concerned about potential damaging effect of unintentional introduction of INNS into this crucially important coastal and marine environment during the deployment and servicing of tidal devices.* | The applicant is committed to management of invasive non-native species (INNS) in an appropriate manner. An outline INNS risk assessment (INNS RA) has been provided, as has an outline Construction Environmental |

| Reference | Document | Section | SoC Comment | Response |
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| | | | | Management Plan (CEMP). Measures to manage INNS during construction, operation and decommissioning will be agreed with NRW and included in the detailed INNS RA and CEMP. |
| | | Section 3) Benthic Ecology | *In the documents on the physical and biological aspects of the seabed in the Morlais area there are statements that more detailed surveys will be undertaken if the project is approved. Based on a MAG Member's own experience of the benthic environment in the tide swept areas off Anglesey, including surveys with side-scan and remote cameras we are fully aware of the difficulties of adequately interpreting the benthic biotopes in the area W of South Stack. However, we consider there were flaws in the original surveys and the interpretations. Full use does not seem to have been made of pre-existing experience of benthic environments in this general part of the Irish Sea, including the series of Biomor surveys led by National Museum of Wales and an SEA6 project to search for patches of Modiolus off Anglesey.*<br><br>*The benthos in these tide-swept areas was shown by earlier work to comprise several components: (A) The soft epifauna on the rocks or on boulders that stand far enough above the lag gravel surface to be less influenced by scour from the grit and shell fragments in the bed load transport. (B) Hard epifauna such as barnacles and tube worms more resistant to the scour. EUNIS and other classification schemes as well as predictive models did not take account of the importance of bed load scour on the benthos. (C) A crevice fauna occurs between the lag that armours the seabed, with the crevices partly packed with both sand and cohesive fines. (D) Sometimes glacial till exists quite closely underneath the lag veneer with a specialised fauna burrowing into the stiff clay. (E) On top of this there are local and variable accumulations of sand in the lee of protruding objects or biogenic features and veneer sand sheets.*<br><br>*Owing to the fact that the hard seabed grabs do not take adequate and representative samples, any grain size analyses* | The applicant maintains that the survey method used was sufficient for the purpose of seabed characterisation required for EIA.<br><br>The method used incorporated review of existing data, geophysical survey and ground truthing of the geophysical survey using drop video systems and grab for the limited areas of survey.<br><br>See preceding responses to NRW Statement of Case for details.<br><br>42 video transects, with 277 still impages were used for ground truthing.<br><br>The location of seabed video transect sampling is provided in Figure A1.<br><br>The applicant is committed to the use of pre-construction surveys to inform development of the project and avoid impacts upon Annex 1 Habitats. The constructive survey design advice provided is welcomed and will be considered during scoping of those surveys. |

| Reference | Document | Section | SoC Comment | Response |
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| | | | *will be unrepresentative. The present data on the Morlais project area seems to be based on a side-scan survey and some drop-down video. In the experience of the MAG member, the best chance of locating any small biogenic reef features requires that the side-scan tow fish is flown at about 5-8m above the seabed and on a slant range setting no more than 150m. Tows with the fish on a shorter umbilical are less likely to detect biogenic features. To adequately characterise the benthic epifauna it would have been better to deploy cameras on a sledge and to take long series of digital stills as well as video. Camera systems have been shown to give better and partly quantifiable results with still cameras shooting at 10 sec intervals with the sled being towed at <0.5 Kt against the current. This means that the towing vessel can steer while stemming the current and any disturbed sediment cloud does not obscure the field of view. Neap tide periods are essential with tows limited to either side of slack.*<br><br>*In reference to an exchange between the developer and NRW about Sabellaria (MOR/RHDHV/DOC/0113), the Biomor and other surveys showed that as a species, Sabellaria spinulosa is very common in the lag gravel areas of the Irish Sea. It often occurs between the cobbles and helps the armouring of the bed by cementing them together. Only occasionally do the worms aggregate together to form masses that can be considered biogenic reefs. Work elsewhere under a CEFAS project where substantial reefs were found, showed that these are short lived features. Modiolus reefs by contrast have life spans measured in centuries.* | |
| | | | *In the MOR/RHDHV/DOC/0111 document there is mention of drilling to install anchoring points for the structures, with some consideration of rock fragments. This needs some further explanation with regard to cuttings, jetting of superficial deposits and drilling muds or grouts, as well as noise and holding the drilling vessel in position.* | Drilling may be used for foundation installation.<br><br>Rock fragments will be discharged to the seabed.<br><br>No drilling muds will be used.<br><br>Noise impacts are considered in the Marine Mammals Statement of Case. |
| | | | *We believe that procedures need to be clarified for limiting the chances of Invasive Non-Native Species (INNS) being brought in either on the devices themselves or* | The applicant is committed to management of invasive non-native species (INNS) in an appropriate manner. An outline INNS risk assessment (INNS RA) has been provided, as has an outline |

| Reference | Document | Section | SoC Comment | Response |
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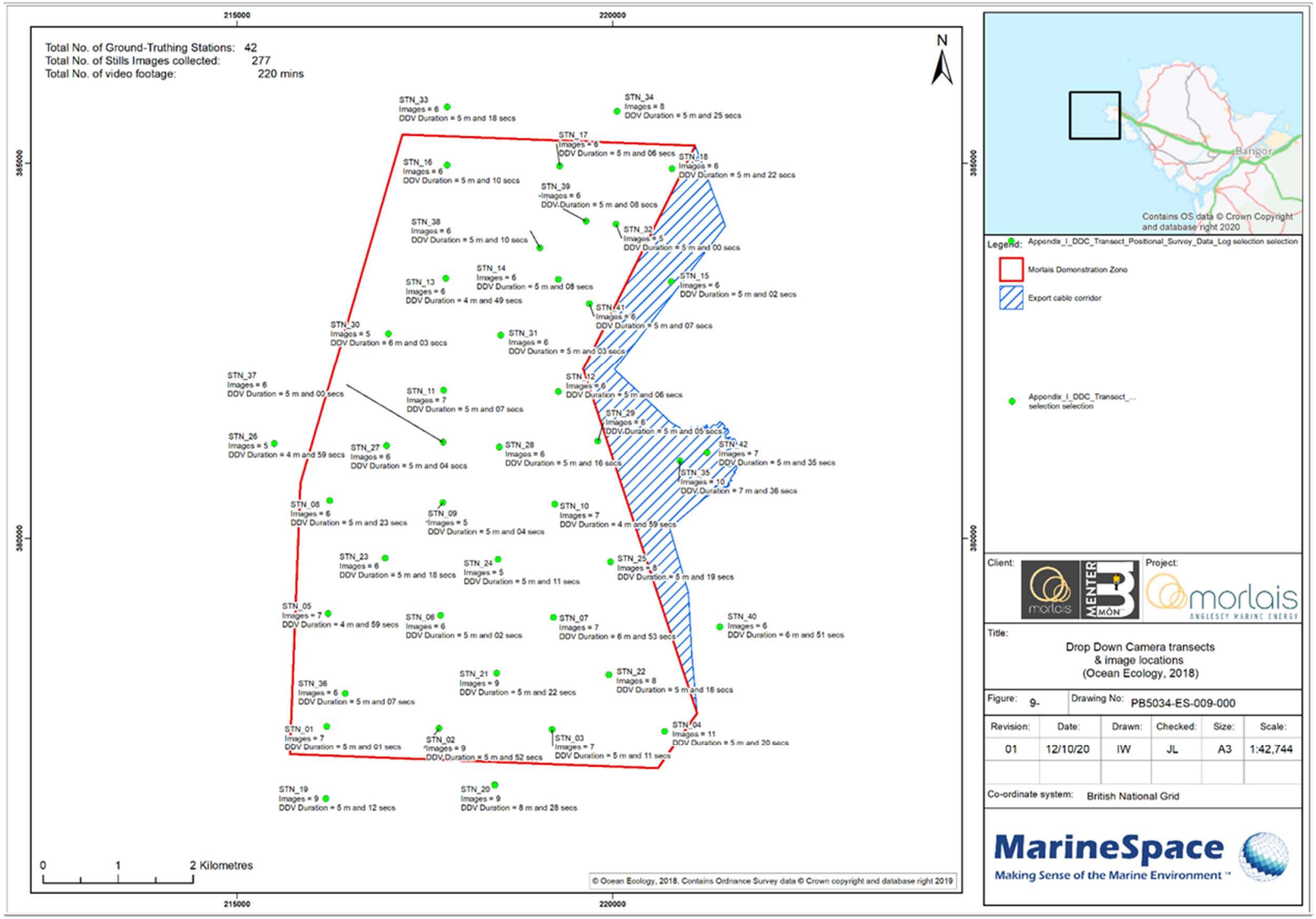
| | | | *more likely on vessels used to carry and fix them in place. We are of the opinion that this has not been clarified in the Additional Information supplied.* | Construction Environmental Management Plan (CEMP). Measures to manage INNS during construction, operation and decommissioning will be agreed with NRW and included in the detailed INNS RA and CEMP |

## Figure A 1 Drop down camera transect and image data from 2018 benthic EIA characterisation survey



# Appendix 3 – Responses to migratory fish issues raised in NRW Statement of Case

### Table A 4 Responses to NRW Statement of Case – Migratory Fish

| Reference | Document | Section | SoC Comment | Response |
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| | | Migratory Fish<br><br>Paragraph 21 | *The ES recognises the potential for collision risk between migratory fish and tidal devices. Given the high levels of uncertainty in fish distribution and behaviours around marine renewable energy devices, it is not currently possible to model their interaction and the consequences of any such interaction. Therefore, NRW considers that a precautionary approach should assume that such collisions would result in fish mortalities.* | The applicant has included of Migratory Fish within the monitoring proposed within the updated (October 2020) Outline EMMP. This is discussed in this PoE, in particular in Sections 5.5 (Purpose of detailed EMMP), 5.10 (Aims and Objectives), 7 (Migratory Fish), and 8 (Conclusions). |
| | | Migratory Fish<br><br>Paragraph 22 | *NRW will argue that the proposal could cause adverse effects to migratory fish species listed in Annex II of the Habitats Directive of designated sites in north Wales, particularly the Atlantic salmon of the Afon Gwyrfai a Llyn Cwellyn SAC. The Afon Gwyrfai is approximately 30km from the proposal and it is likely that juvenile and returning adult salmon will pass through the Morlais Demonstration Zone ("the MDZ") during their outward and return migration to/from the north and north-west Atlantic. NRW accept that the spatial extent of the proposal is limited. However, there is a high degree of uncertainty in the migration routes and NRW considers that there is a potential for migrating salmon to be at risk from collision with operating devices. NRW are currently not able to reach a conclusion on AEOSI based on the information presented.* | The applicant has included Migratory Fish within the monitoring proposed within the updated (October 2020) Outline EMMP. This includes discussion of proposed approach to use of monitoring data to identify Migratory Fish data, as well as a wider commitment to support migratory research undertaken with direct relevance to Morlais.<br><br>An addendum to the HRA has also been provided with a greater degree of assessment of potential for migratory related AEOSI (MMC367 MOR-RHDHV-DOC-0067 (02) Information to Support HRA. Core Document MDZ/A31.16). |
| | | Migratory Fish<br><br>Paragraph 23 | *NRW will argue that there is significant uncertainty regarding fish mortality from collision during the project's operation and that fish-specific monitoring of collisions should therefore be included in the OEMMP.* | The applicant has included of Migratory Fish within the monitoring proposed within the updated (October 2020) Outline EMMP (MDZ/A10). |