



Our Ref: MM/fi/L12-102

Your Ref:

6 September 2012

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Dear Sirs,

MeyGen Tidal Energy – Phase 1 Consents Application

The Scottish Fishermen's Federation (SFF) represents the interests of fishermen in membership of the Anglo Scottish Fishermen's Association, the Clyde Fishermen's Association, the Fishsalesmen's Association (Scotland) Ltd, the Mallaig and North-West Fishermen's Association, the Orkney Fishermen's Association, the Scallop Association, the Scottish Pelagic Fishermen's Association, the Scottish White Fish Producers Association Ltd and the Shetland Fishermen's Association.

With reference to the above application, the SFF welcomes the opportunity to respond on behalf of its membership. The SFF clearly recognises the importance of engaging in this process, but feel that the sheer volume of paperwork involved is bound to be a hindrance to the realistic appraisal of the subject by many stakeholders. We are however cognisant of the real societal and political impetus behind the development of renewable energy both onshore and offshore but remaining conscious of our primary obligation to protect and preserve our indigenous fishing industry have taken on board the need to co-operate in developing practical solutions to enable coexistence with the burgeoning offshore renewables industry.

In respect of the MeyGen application we are aware that the proposed area designated for the tidal generators is not one that is subject to a significant amount of fishing effort. This is not to say that the small local creel boats will not be displaced and their situation needs to be carefully considered by the developers, with a view to mitigating the said displacement.

The SFF's major concerns are primarily over the impacts of this proposed development on the Right of Navigation and the potential safety impacts thereof. The Inner Firth has traditionally been the transit route between East and West coast. The study period may have only picked up 1 vessel per day transiting, but in 2012, for example, the North East of Scotland prawn fleet was forced by circumstances beyond their control to revert to steaming through to the West Coast to fish, as was the case historically, twenty to twenty five years ago. That in itself would have given rise to significantly more traffic than previously recorded, but there are also many occasions when the pelagic fleet has reason to travel between East and West, which may not be picked up by a short time survey.

Members:

Anglo Scottish Fishermen's Association
Clyde Fishermen's Association
Fishsalesmen's Association (Scotland) Ltd

Mallaig & North-West Fishermen's Association
Orkney Fisheries Association
Scallop Association

Scottish Pelagic Fishermen's Association Ltd
Scottish Whitefish Producers' Association Ltd
Shetland Fishermen's Association

VAT Reg. No: 605 096 748

Modern fishing vessels can have draughts up to 8 metre (unladen pelagic vessels) and with any kind of adverse conditions would not be able to safely traverse the array area. The claimed 8 metre clearance for the turbines, in an area of such challenging variable seas, waves and tidal conditions gives the SFF cause for concern as to a realistic expectation of safe transit across the array. This is already noted within the Navigation Risk Assessment, on page 32 where the renowned local skipper Andrew Bremner has stated his reluctance to steam through the array.

The SFF cannot be certain of the analysis in the report of traffic flow, as the fishing industry, as demonstrated above, is of such a dynamic nature that the visual logs referred to can only be taken as a snapshot of activity at any given time.

The SFF is further concerned that the analysis in section 18 of the cumulative and in-combination impacts may be very much under-stated, given the geography and resource in this area and the huge potential for other renewable developments in the near vicinity.

The SFF would expect to be involved in the ongoing consultation process regarding the siting and development of this array, in line with the relevant liaison guidelines as published in the Fishing Liaison with Offshore Wind & Wave (FLOWW), with a view to ensuring that it has a lot less impact on the safe navigation of the Inner Firth. The fishing industry would hope to be involved in the practical aspects of this proposed development, an important part of which will be the process leading to an agreement on how to delineate the area on charts, mark the area at sea and promulgate this information to both the fishing and the wider marine sector.

Although acknowledging the paucity of mobile fishing gear activity in this area, proper consideration needs to be given to the timing of any construction events to minimise disruption.

It is also the stated aim of the SFF that we expect cables to be buried where possible, subject to the suitability of the terrain and after installation should be subject to safety sweeps, by appropriately equipped fishing vessels, again, in line with the FLOWW guidelines .

The SFF would expect a system, similar to that in place with the Oil and Gas sector, be implemented where there is a way of agreeing responsibility for any debris in the sea or any damage caused by that debris.

The SFF also expects that a decommissioning plan will be developed, for which we would strongly expect the outcome to be removal of all infrastructure at the end of its working life.

Without assurances that our detailed concerns will be addressed and actioned to our satisfaction we cannot at this time support the application for consents. If the developers are prepared to give further consideration to the problems highlighted, the Federation is open to dialogue which could lead to our reassurance and remove our current lack of commitment to supporting this development.

Yours faithfully,


Chief Executive
Scottish Fishermen's Federation



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31 August 2012
Reference: 2012/007

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Web www.pentlandcanoeclub.org.uk

Dear Sirs

MEYGEN TIDAL ENERGY DEVELOPMENT:

On behalf of all the Club members, I would like to submit our attached response to the MeyGen Tidal Energy Development Phase 1 Environmental Statement.

We have also attached an extract of an email between our Club secretary and John Beattie concerning the development. We are disappointed that some of our comments and suggested references on sea kayaking appear to have been ignored.

Yours faithfully

[REDACTED]

[REDACTED]

Chairman



Section Title	Paragraph Reference	Comment
Power Conversion Centre	5.45	<p>The Building should be kept as low as possible to minimize visual impact on the area – especially from the main tourist routes. This should include consideration to partly putting the buildings into ground / bedrock</p> <p>Building designs should be in keeping with the area. The proposed roof design looks like it may be susceptible to damage from the wind and corrosion from effects of the sea.</p>
Marine Installation Operations	5.85	It is noted that the proposed time of installation is in the spring/summer at slack water. This is the most likely time that recreational sea paddlers may pass through the development area.
Marine Operations	5.121	<p>The activity planned suggests that this will be throughout the year. However, given the weather conditions especially during the Winter months the Summer months activity is probably higher. Therefore the impact on the flora and fauna maybe underestimated.</p>
Shipping & Navigation	7.40	The small harbours around the Inner sound (Gills; Huna; Stroma; John O Groat etc) are also used as launching/landing locations by sea kayakers.
Scoping & Consultation	Table 15.2	We can confirm that MeyGen consulted with the Pentland canoe Club.
Desk Based Study	15.12	We are disappointed that information supplied to MeyGen (eg Sea Kayaking Guide Books) was not considered during the desk based study. This means that the study in terms of recreational



		navigation is potentially inaccurate.
Field Survey	15.44	This paragraph is incomplete in terms of study as it has missed the use for the area by sea kayakers. Sea kayakers pass over the development site in the Summer months (will not be picked up by radar) and local ports will not have knowledge of the activity. Activity of kayaks will be affected during installation AND maintenance activity.
Field Survey	15.16	Some recreational activity only takes place at the weekend therefore unless the observations took place during these period, the data could be inaccurate.
Navigation Features	15.29	How sea kayakers paddle through the Inner Sound is not recognized by the report. Kayakers will plan different routes in the area depending on the destination (Stroma or travelling through the Sound). This may involve crossing the flow of water (at varying states) taking into account tidal direction and tidal strength), paddling with the tide or against using eddies.
Recreational Vessel Activity Analysis	15.60- 15.64	This section has failed to take account of published guide books on sea kayaking or information supplied on kayaking activity in the area. (See attached email)
	Figure 15.14	This does not include sea kayaking activity which will be missed from method used. Information was supplied on sea kayaking. (See attached email)
Impact 15.1 Collision with Work vessel	Mitigation in Relation	The Pentland Canoe Club would like to be included in the information circulated to recreational clubs. We would suggest that the Caithness Kayak Club should also be included.



	to Impact 15.1	Given that there are a number of sea kayaker who may paddle in the area (eg round Britain paddlers; visitors) we would recommend that the following National Governing Bodies are included: Scottish Canoe Association; Canoe England; Welsh Canoe Association and the Canoe Association of Northern Ireland.
Impact 15.2: Traffic re-routing due to work vessels and associated safety zones	15.82	The standard safety zone of 500m could potentially cause major difficulty to sea kayakers. Sea kayakers can only paddle at an average speed of 3knots. Therefore in planning trip in area with spring rates up to 5 knots (potentially higher at headlands) vectors must be used. Due to the irregularity of flow (depending on a number of factors) the planned route can often vary. Therefore sea kayakers may, through no fault of their own, pass within the Standard Safety Zone.
Impact 15.2: Traffic re-routing due to work vessels and associated safety zones	Mitigation in Relation of Impact 15.2	We welcome that further consultation should be carried out with local stakeholders. We would recommend that the Scottish Canoe Association; Pentland Canoe Club and Caithness Kayak Club are included as stakeholders
Impacts during Operations & maintenance	Mitigation in Relation to 15.4	This appears to focus on mitigation during operation. The impacts during maintenance with increased shipping activity (2.5 times a week) have been omitted. Details of the project should also be included in the Admiralty Pilot. Information should be sent to



		the publishers of sea kayaking guides in order that their guide books can be updated.
Highlands tourism Profile	21.88	Sea kayaking is not confined to Gills Bay and Stroma. Sea kayakers use numerous routes through the Inner sound as part of a day trip / multi day expedition.
	Figure 21.7	Water based outdoor activities have not been included in the tourism receptors. Information was submitted. (See attached email)
	Figure 21.8	Water based outdoor activities have not been included in the tourism receptors. Information was submitted. (See attached email)
Impact 21.5 Recreation Impacts during construction	21.113	Estimates of recreation traffic is considered to be low as the methodology used appears to have missed out recreational sea kayakers.
Impact Significance	21.114	We would ask that the Pentland Canoe Club and Caithness Kayak Club are included in the information circulated. Sports Associations such as the Scottish Canoe Association; Canoe England; Welsh Canoe Association and the Canoe Association of Northern Ireland should be included so that visitors to the area are also made aware of the development. This should also be extended to the RYA and British Sub Aqua Club
Impact 21.8 Tourism and	21.129	Consideration should be giving to reducing the visual impact by lowering the height of the



recreation impacts during operations and maintenance		buildings
Impact 21.8 Tourism and Recreation Impacts during operations and maintenance	21.133	<p>We agree that during operations there will potentially be little impact from the presence of the turbines.</p> <p>The impact during maintenance has been ignored in the report. During routine maintenance, activities will take place 2.5 times per week mainly during slack water (Para 5.126 refers). This means that there will be an increase in shipping activity in the area to undertake this work. This will significantly affect sea kayaking in the area especially when crossing the tidal flow.</p>
Impact Significance	<p>Mitigation in Relation to 21.6</p>	<p>Believe this should read 21.8</p> <p>Mitigation is required given the increased activity during maintenance operations. (See attached email)</p>
Impact 21.13 Recreation Impacts During Decommissioning	<p>Mitigation in Relation to Impact 21.13</p>	<p>We would ask that the Pentland Canoe Club and Caithness Kayak Club are included in the information circulated.</p> <p>Sports Associations such as the Scottish Canoe Association; Canoe England; Welsh Canoe Association and the Canoe Association of Northern Ireland should be included so that visitors to the area are also made aware of the development. This should also be extended to the RYA and British Sub Aqua Club.</p>



Consultation should take place as there may be new stakeholders who could be affected by the proposed work.



24 October 2011: Email Record of Discussion Between John Beattie (Anatec) and the Pentland Canoe Club.

(Wording in blue are the comments back to John Beattie by our Secretary on 24 October 2011)

Thanks again for your time today. As discussed, if you could check my notes below from today's conversation (including some additional questions I've put in asterisks) I'll then forward onto Caithness Kayak Club to see if they have anything to add.

General

- **Pentland Canoe Club activity is mostly organised for weekends when working members are available. Some individual members may occasionally paddle during working days.**
- **Sea Kayaking activity is mostly during Summer months (April to late Sep). Pentland. Occasionally there may be sea kayak trip during the winter months in favourable conditions. Sea kayaking trips** of the Inner Sound would be planned to normally take place during daylight hours.
- **It would be unusual for more than a group of 10 paddlers to participate in a trip in the Inner Sound (– based on current membership and equipment available).** The Scottish Canoe Association (**SCA**) organise an annual **weekend** event that could involve larger numbers of sea kayakers.

Environmental Conditions

- Weather limits would depend upon the composition of the group. **Though it would be unusual for group to be in the inner sound with a wind strength greater than Force 4. Wind opposing a strong tide would normally be avoided. Generally large wave heights have not been encountered by paddlers on trip in the inner sound. Paddles occur at all stages of the tidal cycle (Spring and neap tides). Crossings have occasionally been made in times of poor visibility eg fog, dusk.**

Sea Paddling Routes

- Caithness-Stroma **sea kayaking trips** crossing the Inner Sound is carried out approximately 6 times per year, although fewer this year due to **poorer** weather. This is the only paddle likely to be affected by the MeyGen project. (If transiting off the mainland coast, kayakers would tend to be closer into shore than the MeyGen project area.)
- Routes between Caithness and Stroma depend on tides and other considerations such as parking at launch/egress points. **Over recent years Gills Bay has become a favoured launch / egress point.** John O'Groats tends to be **busier with tourists** and Huna has been used in the past but not as convenient **for the Club.**
- An example route in a flood tide (east-going), would be to launch from Gills Bay ferry terminal, **paddle** towards Scotland's Haven then head north into stream with tide taking the kayakers into Mell Head / Stroma Skerries. On the return trip with ebb tide (west-going), could set off from The Haven or Stroma Skerries, cross near the Spoil Ground marked on charts and end up at Gills Bay. An example during ebb tide would



be to launch from John O'Groats, paddle north and run into Scarton Point, or even drift round to Stroma Skerries.

- There is a guide book with suggested sea kayaking trip – “Scottish Sea Kayaking Fifty Great Sea Kayak Voyages” by Cooper & Reid (2005). One trip in here describes trip involving a crossing of the Inner Sound. This means that other paddlers outside of the local clubs maybe attracted to paddling in the area.

Conclusion & Recommendations

- Should be no impact during operation given the under keel clearance. Only issue would be if the turbines themselves caused a disturbance to the flow. (A specialist study is being carried out into this.)
- The main issue for kayakers is likely to be during Installation & Maintenance when working vessels are in the area. Kayakers may be difficult to spot from the working vessels and although they would not plan to come in close proximity, they could be pushed off their planned course.
- Mitigation should include circulating information on the work activities to the main clubs in the area, who can pass onwards via websites and Facebook, etc. Also useful if kayakers can inform the working vessel(s) about their activity. One method of doing this would be to call up the vessels on a VHF working channel when setting out. Normally the leader of the group will have VHF. **Additionally if there is work going on a notice could be given to the Scottish Canoe Association for an announcement on their website (www.canoescotland.com)** . Announcements of installation work could be made in popular kayaking magazines such as Ocean Paddler; Canoe & Kayak UK; Canoe Focus etc
- Concern was expressed about having to avoid exclusion zones around the Phase 1 area. John explained this would be a rolling zone centred on where activity was taking place rather than covering the whole Phase 1 area. The standard dimension is 500m radius but the Navigation Risk Assessment recommends further consultation on this as a smaller zone may be appropriate for the Inner Sound given the limited sea room. It is also noted that most activity is likely to be around slack water (+/- 60 mins) and at other times the vessel would move away from the site to a safe waiting area. (* Ken, can you clarify would you be crossing the Phase 1 area at or near slack water? - **yes***)
- There would be no intention from the Developer to criminalise any transgressors due to distress or force of weather, **tidal conditions**; the zone is intended to protect the work site from intruders who have wilful intent, e.g., seeking to deliberately disrupt activities.



Association of Salmon Fishery Boards

Response to the marine licence application for the MeyGen tidal power development September 2012

Introduction

The Association of Salmon Fishery Boards is the representative body for Scotland's 41 District Salmon Fishery Boards (DSFBs) including the River Tweed Commission (RTC), which have a statutory responsibility to protect and improve salmon and sea trout fisheries. The Association and Boards work to create the environment in which sustainable fisheries for salmon and sea trout can be enjoyed. Conservation of fish stocks, and the habitats on which they depend, is essential and many DSFB's operate riparian habitat enhancement schemes and have voluntarily adopted 'catch and release' practices, which in some cases are made mandatory by the introduction of Salmon Conservation Regulations. ASFB creates policies that seek where possible to protect wider biodiversity and our environment as well as enhancing the economic benefits for our rural economy that result from angling. An analysis completed in 2004 demonstrated that freshwater angling in Scotland results in the Scottish economy producing over £100 million worth of annual output, which supports around 2,800 jobs and generates nearly £50million in wages and self-employment into Scottish households, most of which are in rural areas.

The evidence available to date strongly indicates that the Pentland Firth is of significant strategic importance as a migration route for Scottish Atlantic salmon. In the absence of site-specific information relating to the use of the development area by migratory fish species and the absence of a suitable monitoring strategy to fill this data gap, we have no choice but to operate under the assumption that the Inner Sound represents the primary migration route for all Salmon returning to North Coast and East Coast rivers and a significant migration route for West Coast rivers.

As stated above, DSFBs have a statutory duty to protect and improve salmon and sea trout *fisheries*. All salmon fishing rights in Scotland (freshwater and marine) are private heritable titles. As the environmental effects of offshore technologies are uncertain, we would expect that developers should be required to remedy any negative consequences of such developments on the heritable assets and the value of those assets (including employment within the fishery) of all fishery proprietors. We therefore believe that, as a condition of consent (should such consent be granted), there should be a requirement for a formal mitigation agreement between the developer and relevant DSFBs.

Overarching Comments

1. Designated Species

As highlighted in the Environmental Statement 17 Scottish rivers are designated as Special Areas of Conservation (SAC), part of the Natura 2000 network – a series of internationally important wildlife sites throughout the European Union. The conservation objectives for these sites are set out below¹.

To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and

To ensure for the qualifying species that the following are maintained in the long term:

- *Population of the species, including range of genetic types for salmon, as a viable component of the site*
- *Distribution of the species within site*
- *Distribution and extent of habitats supporting the species*
- *Structure, function and supporting processes of habitats supporting the species*
- *No significant disturbance of the species*

¹ <http://gateway.snh.gov.uk/sitelink/index.jsp>

- Distribution and viability of freshwater pearl mussel host species
- Structure, function and supporting processes of habitats

The Habitats Directive (article 6) requires that *Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.*

It also states: *In the light of the conclusions of the [appropriate] assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

If this is not the case and there are no alternative solutions, the proposal can only be allowed to proceed if there are imperative reasons of overriding public interest.

The conservation status of the Atlantic salmon qualifying interest for the salmon SACs in Scotland (First Assessment Cycle) are set out in Table 1 below. In addition, a number of these SACs are also designated for FW pearl mussel.

SAC	Qualifying Interest	Conservation Status
Berriedale & Langwell Waters	Atlantic salmon	unfavourable recovering
Endrick Water	Atlantic salmon	unfavourable recovering
Langavat	Atlantic salmon	unfavourable recovering
Little Gruinard River	Atlantic salmon	unfavourable recovering
North Harris	Atlantic salmon	unfavourable recovering
River Bladnoch	Atlantic salmon	unfavourable recovering
River Borgie	Atlantic salmon	unfavourable recovering
River Dee	Atlantic salmon	favourable maintained
River Moriston	Atlantic salmon	unfavourable recovering
River Naver	Atlantic salmon	unfavourable recovering
River Oykel	Atlantic salmon	unfavourable recovering
River South Esk	Atlantic salmon	unfavourable recovering
River Spey	Atlantic salmon	unfavourable recovering
River Tay	Atlantic salmon	favourable maintained
River Teith	Atlantic salmon	unfavourable recovering
River Thurso	Atlantic salmon	unfavourable recovering
River Tweed	Atlantic salmon	unfavourable recovering

Table 1: Conservation status of SACs for Atlantic salmon in the area of the development.

In all cases, with the exception of the Berriedale and Langwell Waters SAC, the Salmon rod catch trends in these SACs as analysed by Marine Scotland Science, show that the spring stock component is in decline. The second assessment cycle is nearing completion, and the results of this assessment must be taken into account in the licensing decision. We believe that the assessment is likely to show that the early running spring component of many of these Atlantic salmon populations continues to deteriorate.

In addition, District Salmon Fishery Boards have a statutory obligation to protect sea trout. The marine phases of both Atlantic salmon and sea trout have also been included on the draft list of Priority Marine Features drawn together by SNH - the habitats and species of *greatest conservation importance* in inshore waters.

2. Climate Change Mitigation and Adaptation

As for many other species, climate change has been identified as a threat to Atlantic salmon. The species' developmental rate is directly related to water temperature, and increasing temperature in freshwater may result in smolts developing more rapidly and entering the ocean at a suboptimal time in relation to their planktonic food sources.

In addition, as air temperatures warm, much of the snow that feeds the river systems is expected to melt earlier. This will lead to a reduction in the flow of many rivers in the spring and summer, which will increase water temperatures further and may reduce the overall optimal habitat available to the Atlantic salmon. It is also clear that survival of salmon and sea trout during their marine migration phase has fallen over the last 40 years. Some of this reduced survival can be explained by changes in sea surface temperature and subsequent contraction of feeding grounds.

The first priority in mitigating these effects is to control atmospheric concentrations of greenhouse gases and we note that the Scottish Government has committed to meeting a stated target of 50% of Scotland's electricity demand from renewable sources by 2020. However, with further climate change inevitable in the short to medium term, attention is now focusing on the development of accommodation and adaptation strategies, through which adverse effects on species or ecosystems can be minimized. Some of the key needs with respect to developing adaptation strategies for rivers and their biodiversity were summarised by Ormerod (2009 – *Aquatic Conserv: Mar. Freshw. Ecosyst.* 19: 609–613). We would highlight the following key point in particular: *to minimize the adverse effects on river biodiversity of actions taken to mitigate climate change.*

3. Potential Negative Effects of Offshore Renewable Devices

Offshore renewable developments have the potential to directly and indirectly impact anadromous fish such as Atlantic salmon and sea trout. We would therefore expect developers to assess the potential impacts of deployed devices on such fish during the deployment, operation and decommissioning phases. Such potential impacts have been highlighted by Marine Scotland Science and could include:

- Avoidance (including exclusion from particular rivers and subsequent impacts on local populations);
- Disorientation effects that could potentially affect behaviour, susceptibility to predation or by-catch; and
- Impaired ability to locate normal feeding grounds or river of origin; and delayed migration

ASFB therefore recommend to our members that careful consideration should be given to the following activities:

i. Subsea noise during construction

A recent review commissioned by SNH² states that 'Marine renewable energy devices that require pile driving during construction appear to be the most relevant to consider, in addition to the time scale over which pile driving is carried out, for the species under investigation'.

ii. Subsea noise during operation

iii. Electromagnetic fields (EMFs) arising from cabling

The SNH-commissioned review (cited above) has shown that EMFs from subsea cables have the potential to interact with European eels and possibly salmonids if their migration or movement routes take them over the cables, particularly in shallow waters (<20m). Marine Scotland Science are currently undertaking a research programme which aims to investigate electro-magnetic force impacts on salmonids. We would

² Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Available at: <http://www.asfb.org.uk/wp-content/uploads/2011/06/SNH-EMF-Report1.pdf>

hope to have some results from this work later in 2012. It is vital that all cables are appropriately shielded to ensure that EMF effects are below any threshold of effect for salmonids.

iv. *EMFs arising from operation of devices*

It is important to ensure that such effects are quantified and assessed in the Environmental Statement.

v. *Disturbance or degradation of the benthic environment (including secondary effects on prey species)*

It is important to ensure that such effects are quantified and assessed in the Environmental Statement.

vi. *Aggregation effects*

Whilst the aggregation of prey items around physical structures might be seen as a positive effect, possible negative effects might include the associated aggregation of predators.

4. General Comments on the Application

Guidance issued by Marine Scotland Science relating to information requirements on diadromous fish of freshwater fisheries interest states that an Environmental Statement should provide information on the use of the development area by such fish and that if such information was lacking then a suitable monitoring strategy should be devised. No monitoring strategy is set out in the application and we believe that the lack of meaningful monitoring in the present proposal is extremely disappointing and completely inadequate. We welcome the fact that the developers have accepted that there remains significant uncertainty around a number of the potential identified impacts and have committed to conduct monitoring to validate the conclusions in the application. We welcome this undertaking, but we would emphasise that any monitoring strategies must include pre-construction monitoring in order that baseline information on salmon and sea trout movement, abundance, swimming depth, feeding behaviour etc. can be collected. We do not have any strong preference over whether such monitoring should fall under project specific monitoring or strategic, collaborative monitoring as set out in section 2.22.

Specific comments

Our specific comments relate to the potential effects highlighted in Section 3 above and are primarily concerned with Section 13 (Fish Ecology).

13.2 Assessment Parameters (and 2.2 Consideration of Design Options)

As with other applications for offshore renewable energy, the Rochdale Envelope approach is set out in the application. Whilst the developer sets out the legal precedent for such an approach, it must be emphasised that this approach makes it extremely difficult for stakeholders to assess the potential environmental risk as there is little detailed information on: the likely size of the scheme; the type of devices to be deployed; and the degree of confidence attached to the assessment of impacts. Our comments must therefore be viewed on that basis.

13.5 Baseline Description

13.46: This section states: *'Based on the available information and taking a precautionary approach it is assumed that Atlantic salmon do pass through the Inner Sound during their migrations to and from the sea as well as the rest of the Pentland Firth. It is also assumed that both Adult salmon and smolts pass through the turbine deployment area although evidence may point to the contrary; that smolts and adult salmon may pass over the turbines or avoid areas of high current velocities.'* Whilst we welcome the recognition that Atlantic salmon do pass through the Inner Sound, there has been no attempt to assess what proportion of smolts and returning adults use this area. Such an assessment is crucial to many of the assumptions made later in the application, particularly those relating to the probability of fish colliding with devices. No evidence is presented to support the assumption that fish use the rest of the Pentland Firth during their migrations. In the absence of such evidence, and until contrary evidence is presented, we have no choice but to operate under the assumption that the Inner Sound represents the primary migration route for all Salmon returning to North Coast and East Coast rivers and a significant migration route for West Coast rivers.

13.6 Impacts during Construction and Installation

Impact 13.3: Noise

13.157 and *Impact Significance*: We welcome the recognition there are limitations on these assessment criteria and further work in this area is required. However, it is not clear what potential mitigation measures might be available should the assessment prove to be inaccurate. We would expect such mitigation measures to be clearly laid out and, if they prove to be adequate/ appropriate, for these to be set out as a clear condition of consent.

13.7 Impacts during Operations and Maintenance

Impact 13.13: Increase of available habitat

We do not agree with the conclusions of this section. Whilst we agree that the device foundations and cable protection are likely to be colonised by numerous marine organisms and that these structures could act as a refuge for some fish and prey species, we believe that the potential benefits of such effects are overstated. Indeed, in the case of wild salmonids the effect may be negative and significant. It is likely that such structures will act as fish aggregation devices (FADs), rather than actually increasing overall biomass of such species. However, if the structures do act as FADs we would also be concerned that such areas may in fact represent new 'pinch points' for predation of migrating smolts and returning adults. This possibility does not appear to be considered in the application.

Impact 13.14: Noise

13.214: This paragraph asserts that an expected strong avoidance reaction would only occur when fish are in close proximity to the foundations. However, it must be noted that salmonid smolts are physiologically stressed in adapting to the environmental challenge of movement between freshwater and seawater. Simultaneous challenge from noise, EMFs etc. during this transition will constitute a significant additional stressor. Stress leads to increased plasma levels of the stress hormone cortisol. Corticosteroids cause a range of secondary effects, including hydromineral imbalance and changes in intermediary metabolism (Wendelaar Bonga, 1997)³. In addition, tertiary responses extend to a reduction in the immune response and reduced capacity to tolerate subsequent or additional stressors (Wendelaar Bonga, 1997). It is also important to recognise that the significance of such an avoidance effect requires an understanding of its consequences. The ES assumes that the displacement and the adoption of avoidance behaviour by individual or aggregations of salmon and sea trout from their original locations as a result of underwater noise has no implications in respect of fitness or survival. We do not believe that this assertion can be substantiated as it may lead to significant physiological stress or increased risks of predation.

Impact 13.15: Electromagnetic fields (EMF)

The assessment of the effects of EMFs is limited to EMFs related to the cabling. No consideration is given to the possibility of EMFs arising from the operation of the devices themselves. We would seek clear evidence that no such EMFs are generated by the tidal devices proposed for installation, or a clear risk assessment, should such devices generate EMFs. In the absence of such evidence the potential risks to migratory salmonids arising from EMFs cannot be adequately assessed.

13.223: We welcome the recognition that, *'it is still generally considered that the current state of knowledge regarding the EMF emitted from subsea power cables is too variable and inconclusive to make an informed assessment of any possible environmental impact of EMF.'*

13.230: This paragraph makes clear that 'it is not known to what extent the exact magnitude of the iE-field (induced electric field) emissions will be from the cables used for the array but it is considered likely to be low'. However, the basis for this assertion is not clear. We are aware that Marine Scotland Science are currently undertaking a research programme which aims to investigate electro-magnetic force impacts on salmonids. Until this work is completed, we are unable to assess the relative magnitude of any impact. We note from section 1.10

³ Wendelaar Bonga, S. E. (1997). The stress response in fish. *Physiol. Rev.* 77, 591-625.

that each turbine will have its own export cable to shore and that the cables will be laid across the seabed. However, no alternative solutions are assessed. For example, what would be the EMF implications if intra-array cables were utilised, and only one export cable to shore was used? The sea bed geology means that cables cannot reasonably be buried. However, we would expect other mitigation measures, such as rock burial, to be assessed should the MSS study demonstrate likely impacts on salmonids.

13.231: This paragraph is confusing and contradictory. On the one hand the developer asserts that organisms moving *parallel* to the cable will not generate an iE-field. The developer then goes on to assert that as salmon will move with the flow (with cables laid across the flow), the iE-field will be reduced. The developers also state that for other species that are not migrating through the area this will mean that impacts will only occur when fish are orientated in the same direction as the cables. More clarity is required in order to assess the risks to migratory salmonids.

Impact 13.16: Barriers to movement

13.246/ 13.247: No evidence is presented to substantiate the assertion that the Pentland Firth as a whole will be utilised by the east coast population of Atlantic salmon. It would certainly be extremely unlikely, and contrary to any evidence that we are aware of, that the entire width of the Pentland Firth would be utilised evenly. Whilst we accept that any potential barrier effect would only present itself when the turbines are operational, and that other migration routes might be available, we do not accept that such an effect would be of minor significance.

Impact 13.17: Collision with turbines

We have a number of difficulties with the approach employed to determine the risk of collision with turbines. One aspect that is not considered is that fish may pass through the development area on a number of occasions. This is likely to be the case for smolts, for which the maximum swimming speeds are less than the peak tidal flow in the area (as a consequence smolts will conceivably pass through the area on a number of occasions with the ebb and flow of the tide), and for returning salmon, which could reasonably be expected to transit the area as they search for their natal river. Presumably, a number of factors which are not considered in the ES will have a significant influence on collision rate, such as visibility (strongly related to avoidance behaviour, and which will change according to time of day, season and weather conditions), and the speed at which the blades turn. In addition, for the reasons outlined above, we believe that the assumptions used in the encounter model are flawed and are not in accordance with the precaution required by the Rochdale envelope approach. In particular, the assumption in section 13.258 that the area in cross section of the Pentland Firth occupied in the tidal array can be used as a proxy for the proportion of salmon that utilise the Inner Sound is flawed and has no ecological basis. On that basis we do not accept the assertion that the impact significance is not significant.

Conclusion

As stated above, ASFB recognises the importance of offshore renewable energy. However, the environmental statement has failed to demonstrate that the development will not adversely affect the integrity of the SAC rivers around Scotland. Where a Natura site is involved, the onus is on the developer to demonstrate no impact and in the absence of that the precautionary principle will apply. Under these circumstances, we do not consider that the proposed development is compatible with the requirements of the Habitats Directive or Scotland's Marine Nature Conservation Strategy. On that basis, we have no alternative but to formally object to the proposed development, until adequate monitoring and mitigation strategies have been put in place.

It should be emphasised that we have no wish to prevent or delay the proposed development unnecessarily and we remain keen to work constructively with the developers, Marine Scotland and Crown Estate to identify appropriate monitoring programmes which will allow us to be able to assess the acknowledged risks of this development, and other proposed developments in the Pentland Firth more appropriately. We stated in our introduction that we believe that a formal mitigation agreement should be a condition of consent. In addition, there is a clear and urgent need to fund, plan and start strategic research on the movement, abundance, swimming depth, feeding behaviour etc. of salmon and sea trout. Such research would clearly feed into the potential mitigation measures that might be deemed appropriate, and the conditions under which such mitigation should be enacted. One aspect that should be considered immediately is the installation of fish counters, particularly in SAC rivers, to allow the real time understanding of adult salmon abundance (and depending on local conditions, new technology might even allow information on smolt escapement to be

collected). We believe that the installation of such counters, in close liaison with the DSFBs in question and MSS, could potentially be considered as a condition of consent, where appropriate to local conditions, should such consent ultimately be granted. Developers should be encouraged to work together to fund such strategic monitoring, including the on-going costs of operating such counters, in order to allow more certainty for all involved.

The advent of tidal turbines and other technical approaches to marine renewables development represents a step-change in the exposure of marine animals of high cultural and economic significance to attendant risks. In many cases, understanding of the risks is insufficient to support proposals for mitigation even at this late stage when substantial developments are being submitted for licensing. The cumulative impact of the MeyGen proposal and those developments that are likely to follow during the next decade or so is potentially even greater. We would therefore recommend that an expert group is set up to rapidly consider the best way forward to plug the considerable knowledge gaps that remain. It is important that the best scientific and biological talent is made available to find practicable ways to address the unresolved issues. ASFB would be very keen to constructively engage with such a group.

For further information please contact:

██████████ | Policy & Planning Director
Tel: 0131 272 2797 | Email: ██████████@asfb.org.uk

Unknown

From: [REDACTED]@bt.com
Sent: 31 August 2012 10:59
To: MS Marine Licensing
Subject: RE: 009/TIDE/MGIS1 - 6: One Week Before Request For ES Comments Meygen: 31 August 2012
Follow Up Flag: Follow up
Flag Status: Blue

Nil Return

Regards

BTO Service Delivery -Operations Control TM, Radio Frequency Allocation & Network Protection

Tel 0191 2696372

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Let us know how we're doing here in SD Oerations Control... Please take our 30sec Mini-Survey below

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From: Andrew.Sutherland@scotland.gsi.gov.uk [mailto:Andrew.Sutherland@scotland.gsi.gov.uk] **On Behalf Of** MS.MarineLicensing@scotland.gsi.gov.uk
Sent: 31 August 2012 10:58
To: [REDACTED]
Subject: 009/TIDE/MGIS1 - 6: One Week Before Request For ES Comments Meygen: 31 August 2012

Dear [REDACTED],

ELECTRICITY ACT 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000

The Electricity (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND A MARINE LICENCE UNDER PART 4, SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE A TIDAL ARRAY, INNER SOUND OF THE PENTLAND FIRTH

Please find attached the consultation letter for the above application. I would be grateful for any comments you have by **7th September 2012**. If you are unable to meet this deadline, please contact us to arrange an extension to the consultation period. If you have no comments to make please submit a "nil return" response.

Best regards,

Andrew

19/10/2012

Andrew Sutherland

Marine Renewables Licensing Advisor

Marine Scotland – Marine Planning & Policy Division

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Dh'fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chlàradh neo air a sgrùdadh airson dearbhadh gu bheil an siostam ag obair gu h-èifeachdach neo airson adhbhar laghail eile. Dh'fhaodadh nach eil beachdan anns a' phost-d seo co-ionann ri beachdan Riaghaltas na h-Alba.

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Response to Mey Gen Consultation package, Aug/Sept 2012

We are pleased to have the opportunity to further comment on the detailed proposals in the above package. We note that in section 15 the long standing, 1970 onwards, **usage of the Inner Sound of the Pentland Firth by kayaking groups is acknowledged** in one of the tables **as an issue requiring cognisance and possible mitigation.**

We again stress that the Inner sound has regular Kayaking groups from:

Caithness Kayak Club,
Pentland Canoe Club,
Glenmore National Outdoor Centre,
Visiting Groups, British and foreign,
Round Scotland/Britain paddlers.

We note that liaison is planned with local fishing interests. **We suggest that such liaison is formally set up with local paddlers and with the Scottish Canoe Association.** This will allow information reach a wide paddling audience.

(SCA, Caledonia House, 1 Redheughs Rigg, Edinburgh, EH12 9DQ

email for Access person: eddie.palmer@classmail.co.uk

web site: Canoe Scotland.org.uk)

Our current practice is to inform HM Coastguard of any planned activities in the Pentland Firth, liaising with them on the water by VHF radio as required and informing them of when groups are safely off the water.

We have read and endorse the information in the current Pentland Canoe Club response. Sea kayaks are low powered vessels, almost invisible on radar, which are extremely sea worthy, but a times subject to unexpected tidal effects. Groups can be pushed off the planned and anticipated route, and have in our experience been regularly so affected in the waters of the Pentland Firth.

How this sits with any exclusion zones around installation and maintenance vessels will need close liaison and monitoring. We have had no problems with exclusion zones around single point mooring buoys in Scapa Flow, but they are non-tidal waters.

We note the clearance of 8 metres above blade tips, but see no reference or estimate re possible added turbulence to the tidal waters of the Inner Sound. The area proposed is on various traditional routes used by kayaking groups, and the vertical eddies and swirls already there are well known to us. **We are most interested in any further turbulence that may be created.**

To conclude we fully understand the reasons for the “industrialisation” of this area of North Caithness, and trust that the issues are tackled fully, openly and effectively. Reading the EIA one gets the impression that the language used maybe understates the effects the tidal arrays and infrastructure will have. **There is an opportunity here to ensure that all interests are safeguarded in this challenging and exciting endeavour to ensure future energy supplies.**

**The Viscount Thurso MP
Thurso East Mains
Thurso
Caithness
KW14 8HW
01847 894845**

Chairman – Caithness District Salmon Fishery Board

4th September 2012

Mr Andrew Sutherland
Marine Renewables Licensing Advisor
Marine Scotland – Marine Planning & Policy Division
Scottish Government
Marine Laboratory
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ABERDEEN. AB11 9DB

Mr Andrew Sutherland,

Your Reference: 009/TIDE/MGIS1-6

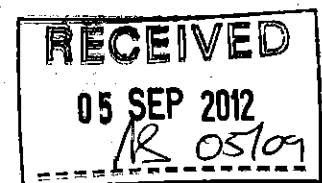
The Caithness District Salmon Fishery Board is charged with protecting salmon and sea-trout in the area that lies closest of all to the location of the proposed MeyGen development. The Board's area contains five major rivers that support migratory salmonids - Forss, Thurso, Wick, Dunbeath and Berriedale/Langwell - and two of these - Thurso and Berriedale/Langwell - are SAC designated for Atlantic salmon. Additionally, the Wester and several smaller streams support, or are likely to support, sea-trout. The Board is therefore at the forefront in having to manage any impacts on migratory salmonids that may arise from marine renewables development in the Pentland Firth, including the current MeyGen proposal.

The Board endorses the response submitted by the ASFB. The Board is fully aware of the potential benefits from marine renewables development but is also mindful of its duties to conserve salmon stocks. The Board therefore welcomes the opportunity to comment on the Environmental Statement and has done so in some detail in the attachment. However, one of the clear overall messages to be taken from the Environmental Statement is that assessment of the possible effects of the proposed development on migratory salmonids in rivers close to the site is hampered by lack of the necessary biological information.

Accordingly, if a survey, deploy and monitor approach is to be adopted, the Board would expect to see a comprehensive monitoring and assessment programme for salmonids incorporated in the Development Plan. Monitoring effort should centre on the Board's area because its rivers are in closest proximity to the development site. The Board wants to cooperate fully in facilitating such a programme in line with its duty to protect migratory salmonids, but is also mindful of the need to ensure costs are appropriately shared.

Our detailed comments in the attachment are confined to the material presented in the Environmental Statement or to issues which it raises. Our comments are necessarily provisional at this early stage in the consent and licensing process, not least because many important details of the development remain to be finalised. Accordingly, the Board would expect to see the Construction Methods Statement and any other relevant material as it becomes available and to comment also on these.


Chairman
Caithness District Salmon Fishery Board



Caithness District Salmon Fishery Board

Comments on Marine License Application by Meygen (July, 2012) re. Inner Sound.

The current Meygen application proposes the installation of an array of tidal turbines in the Inner Sound of the Pentland Firth, between Stroma and the mainland. The Marine License proposal submitted to Marine Scotland relates to the period 2014 – 2020. The proposed installation (Phase 1 of the total 398MW project) is expected to be rated at a total of 86MW which, under current turbine design limitations, equates to 86 units (ie. each unit rated at 1MW). In summary, the turbine units will sit on the seabed, the array of units will occupy an area of around 1.1 km², rotor diameter is likely to be in the range 16-20m and minimum clearance to the sea surface is 8m. Work is intended to commence in 2014 and Phase 1 (ie. 86MW) will be completed over three years.

The following comments relate to only two parts of the application document - (1) the Habitats Regulations Appraisal (HRA) of the risk posed by the proposed MeyGen development for the Rivers Thurso and Berriedale & Langwell, which are NATURA sites and designated SACs for their salmon populations and (2) the Fish Ecology section of the more generally relevant Environmental Impact Assessment (EIA). The documents are treated in this order because themes developed in detail in the HRA can be seen to have been incorporated in summary form in the EIA.

1.a. In Section 7.6 of the HRA report, the personal communication attributed to Youngson is mistaken (see also 13.267 in the EIA). The comment in question was made in the context of the high current speeds present in the Inner Sound and should read “The net movement of smolts in the Inner Sound is expected to be dominated by the effects of the prevailing current since current speed (up to 3 m/s) often grossly exceeds the maximum sustainable swimming speed of smolts (about 0.15 m/s)”. The same consideration of swimming capacity in relation to current speed will apply to smolts originating from west coast rivers.

1.b. In order to justify the exclusion of smolts originating from western rivers from the HRA along the lines attempted in 7.6, it is necessary to establish a connection between the Shelf Edge Current and western origin smolts (eg recaptures of tagged fish) or at least to show that the smolts are capable of moving into the Shelf Edge Current directly from these rivers. Neither has been done and, therefore, the exclusion is not justified. Indeed, examining the pattern of coastal circulation for northern and western Scotland (See eg. Fig. 3.92 in http://chartingprogress.defra.gov.uk/feeder/Section_3.4_Circulation.pdf) suggests that western

origin smolts may well be delivered to the vicinity of the Pentland Firth by the Scottish Coastal Current, depending on the magnitude of its velocity relative to the swimming capacity of the fish. Therefore, this point and Section 7.7 of the HRA report should be re-considered.

2.a. Section 7.5.6 of the HRA report uses a probabilistic approach based on turbine parameters and a set of assumptions on salmon behavioural parameters to consider the risk of collision with turbines. One of the behavioural assumptions is that individuals pass only once through the development area. All of the scenarios described are conditional on single passage although this does not appear to be explicitly acknowledged.

2.b. In fact, some adult salmon may make repeated passages through the area as they search for home river cues. Some aspects of the patterns of recovery of tagged fish reported by Malcolm et al. (2011) are not inconsistent with repeat passage but nor can they demonstrate that repeat passage occurs since fish were recaptured only once after tagging. Repeat passage associated with searching behaviour might be expected to be more frequent for fish returning to rivers in the vicinity of the proposed development since coastal searching behaviours are expected to replace navigational behaviours in the vicinity of the home river. In relation to the Inner Sound, a higher level of collision risk for individuals returning to the Thurso is therefore expected.

2.c. In addition, acoustic tagging studies of adult salmon show that their ground speed and directional progress on the Angus coast is influenced by the speed and direction of tidal flow (Smith et al., 1981. Scottish Fisheries Research Report No. 21). In the more extreme case of smolts, their small size means that their commensurately low maximum sustainable swimming speed (1 body-length or ca. 0.15m /s) is much less than the maximum tidal current speeds that pertain in the Inner Sound (> 3 m/s). At high tidal speeds, therefore, the net movement of smolts (and probably adults, too) will be dominated by the displacing effects of tidal speed and direction rather than by the swimming activity of the fish. In these circumstances, it is conceivable that the same individuals will pass repeatedly through the development area with the ebb and flow of the tide. [As a point of information, this possibility is likely to be susceptible to examination using hydrodynamic particle flow modelling and an evaluation of this approach is on-going at the Environmental Research Institute in Thurso (Prof. Stuart Gibb)].

3. In Section 7.5.6 of the HRA report, avoidance rates have been factored in which have the effect of reducing the expected rates of collision for salmon which encounter turbines. Presumably, avoidance behaviour will be prompted by visual cues meaning that blade speed, blade visibility to

fish, water clarity, light intensity and reaction times will all combine to determine whether avoidance behaviour occurs and whether it occurs quickly enough to be successful. These aspects have not been discussed. More particularly, in relation to light intensity, it should be noted that turbines will be operative at times of low ambient light and during darkness when avoidance rates may well approach zero. This does not appear to have been addressed and, therefore, it must be concluded that the proposed avoidance rates are too high (see also Section 13.273 in the Environmental Statement).

4.a. Section 7.113 of the HRA report concedes that in many respects the biological background is insufficient to support robust impact assessments and specifically identifies turbine collision risk for fish as being in this category. In Section 7.114, the developer expresses a commitment to developing a fish monitoring programme in the context of the "Survey, Deploy and Monitor" strategy without specifying what form this might take.

4.b. In the case of salmon and turbine collision a monitoring programme might be based on surveillance of the fisheries for evidence of turbine-specific trauma using the approach developed for salmonids by Carss (1990) ("Beak-prints" help in war against aerial invaders. Fish Farmer 13: 46-47 and also deployed in relation to the assessment of seal carcasses for evidence of turbine damage in Strangford Lough (as per Section 8.83 of HRA report). It is quite likely that the results of non-lethal blade strike will be characteristic and distinguishable from other forms of damage. For example, injury or scale-loss will probably be restricted to linear damage on either the dorsal or ventral body surface, depending on whether the strike is made on the downwards or upwards passage of the blade. In contrast, non-lethal damage by dolphins, for example, would probably involve opposing V-shaped patterns of injury and evidence of puncture wounds. The profile of the turbine blade edge (when known) might also produce characteristic marks.

4c. The frequency of non-lethal trauma detected in the fisheries could be used to estimate the frequency of lethal trauma knowing the operating parameters of the turbines (ie. proportion of time at given rotation rate). Since the blade mass is high relative to fish mass, presumably the blade speed at the impact point and the point force exerted by the blade edge design will be the main determinants of the magnitude of the trauma caused by a strike. Impact speed will vary with rotation speed and also with the contact point along the blade radius, being near-zero at its origin at all rotation speeds and greatest (but variable) at the tip. [Although the information does not appear to be presented in the proposal documents, the operational blade tip speed value is reported to be ca.12 m/s, or 43 kph (MeyGen, pers. comm.)]. If the energy imparted to strikes made at different

points on the blade radius was known, and knowing the operation characteristics of the turbines, the frequency of non-lethal trauma (ie. survival to fishery) could be used to estimate the frequency of lethal damage (ie. non-survival through direct mortality or consequent predation), knowing also the proportion of the rotor area swept by the (variable) lethal portion of the blade.

4d. It is also important to note that deployment of a formal, expert system for the evaluation of damage recognised in fisheries would preclude the erroneous attribution of trauma to turbine strike when a range of other, unrelated causes of trauma (eg. dolphins, seals) may be in play.

5. In Section 13.280 of the Environmental Statement the personal communication attributed to Godfrey raises the possibility that fish avoid areas of high flow (ie. turbine locations). However, it should be noted that, when the sea floor cannot be seen, pelagic fish are deprived of terrestrial cues. The expectation must therefore be that fish swimming at night, or by day in water > ca. 20m depth, have no ability to evaluate the ground speed of their surroundings and, therefore, no basis on which to avoid regions of high flow.

6a. Section 13.14 of the Environmental Statement, MeyGen accepts that there is uncertainty about some potential impacts from the Project and is committed to undertaking a post installation monitoring programme in order to determine the nature of those impacts. Caithness District Salmon Fishery Board shares this view and recommends a monitoring programme for migratory salmonids centred on those rivers closest to the proposed development and particularly those with SAC designation. The purpose of this programme would be to monitor risks that have been identified but which remain uncertain or to identify emergent risks that may adversely affect salmonids in order to inform mitigation measures.

6b. Paragraph 4b, above, suggests a specific approach to monitoring collision damage.

6c. In relation to more general monitoring of trends for salmonid populations it should be noted that some work of this kind is already conducted in the Board's area and, therefore, that some pre-development data on population abundance already exists. In particular, SNH commissions electric fishing surveys of juvenile salmonid density in the SAC rivers (Thurso and Berriedale/ Langwell) although the work is carried out only intermittently (every five years) in line with the requirements for Site Condition Monitoring. Data exist for 2005 and a report is awaited on survey work carried out in 2011. A total of 15 sites are surveyed for Berriedale/ Langwell and ? for Thurso. In addition, the Caithness Board carries out its own electric fishing programme on the five major rivers in its

area. The resulting data are to be reviewed by the Board before 2013 in order to consolidate and re-focus the programme in line with the Board's other priorities and in line with the Board's resources. Because the drivers differ, the Board's programme is less intensive than the one employed by SNH to fulfil statutory requirements and, in the present context, the SNH approach must be regarded as the appropriate model. In relation to the proposed development, the Board recommends that electric-fishing survey work on the five Caithness rivers should be upgraded to match the SNH standard for density of survey sites and intensified by carrying out annual surveys of each site. This approach will provide formal data for trends in population abundance for juvenile salmonids in relation to the emerging pattern of marine renewables development by MeyGen and others. It will also strengthen the ability to interpret survey data from the two (only) SAC rivers in the area by providing a regional context of similar quality.

6d. While juvenile abundance describes the productive state of the river itself, juvenile densities are insensitive to variations in adult spawner numbers when adults are abundant (as is presently the case for some components of stock) because the limited natural capacity of freshwater to accommodate juveniles has the effect of capping juvenile density at a maximum value. To overcome this insensitivity, statistical analysis of catch data can be used to directly detect variation in trends for adult abundance as demonstrated by Youngson et al (2002) for the spring component of the adult catch (Rod catch trends for early-running MSW salmon in Scottish rivers (1952–1997): divergence among stock components. ICES J. Mar. Sci. 59: 836-849). Additionally, the same approach has been validated for the summer components of the stock in an unpublished follow-up study carried out by MSS [Thorley et al. (2010). Inter-decadal changes in the abundance of Atlantic salmon (*Salmo salar*) in Scottish waters as inferred from patterns of spatial and temporal coherence in catch data (1952-2001)]. In the context of the proposed development, and because of the high level of underlying coherence in catch trends among Scottish rivers, future trends for the Thurso catch, for example, might be compared with those for other rivers that are less likely to be impacted by marine renewables development. This comparative approach has already been developed by Vollestad et al. (2009) (Divergent trends in anadromous salmonid populations in Norwegian and Scottish rivers. Proc. Roy. Soc. B 276: 1021-1027) and used to compare regional trends in adult salmon abundance across the Norway/ Scotland range. The Board recommends that the feasibility of application of a similar comparative approach should be investigated in the context of the proposed MeyGen development.

6e. Statistical analysis of catch trends has the merit of being relatively inexpensive but it will not support real-time surveillance of adult salmon abundance because of (unknown) inter-annual

variation in exploitation rate. In order to overcome the limitations of the other options for surveillance, the Board recommends that fish counter technology should be deployed to obtain real-time information for adult migratory salmonids. Fish counters are already installed on some Scottish rivers but the nearest existing counter to the proposed development is on the River Helmsdale, ca. 90 km distant. The Thurso is the closest salmon river to the Inner Sound (and other areas of potential development in the Pentland Firth). The Thurso is therefore most at risk from the uncertainties that MeyGen acknowledges are associated with the proposed development and has the additional status accorded by SAC designation. The Board therefore recommends that a fish counter should be installed on the River Thurso. In this regard, an apparently suitable site exists at an existing stone-built weir about 2 km from the river mouth. The Board recommends that real-time abundance of migratory salmonids should be monitored and that this process should be implemented before, or near the beginning of the (phased) Meygen development.

7. The Board recommends that a contingency plan should be prepared in order to pre-determine the conditions under which mitigation would be considered necessary and to consider the range of mitigation measures that might be adopted. As acknowledged by MeyGen, some of the potential measures might be enacted by the developer through design modifications or modification of working protocols. However, fishery management measures such as hatchery work, catch and release or fishery suspension might also be enacted at the Board level in order to ensure the continued well-being of local salmon populations. A contingency plan would also serve to align the interests of the Board and the developer at the outset and to assign provisional responsibilities to both parties.

8. Although the Board has focussed closely on its own areas of responsibility, it should be recognised that it shares many aims with, for example, SNH and MSS. Many of the measures the Board has recommended in pursuit of its own statutory duties would enhance the capacity for management and policy development by organisations such as these.



6th August, 2012.



Delivering for Britain

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7 September 2012

Dear Sir/Madam,

RE: APPLICATION TO CONSTRUCT AND OPERATE A TIDAL ARRAY, INNER SOUND OF THE PENTLAND FIRTH

The Chamber of Shipping welcomes the opportunity to provide comments on MeyGen's application to construct and operate a tidal array in the Inner Sound of the Pentland Firth. While we are happy to accept the application based on the results of the Navigational Risk Assessment (NRA), we wish to raise a number of issues that should be considered by MeyGen and Marine Scotland.

As indicated in our 18 July 2011 comments on the EIA Scoping Document, our primary concern regarding this project relates to the maintenance of sufficient under-keel clearance (UKC) to reduce the risk of collision between vessels and sub-surface tidal turbine structures to tolerable levels. We therefore welcome the focus on this issue in Chapter 15 of the NRA.

We are satisfied with the proposed LAT surface clearance range of 8-12m. The UKC afforded by this level of surface clearance is likely to be sufficient under all conditions for the regular running ferry *Pentalina*. However the presence of vessels with draughts close to 8m in the Inner Sound (as described in Chapter 6 of the NRA), coupled with the impacts of factors such as surge, sounding accuracy and wave motion, indicates that there is a strong risk of collision if detailed and timely information is not promulgated to mariners (see below). We are particularly concerned that the worst case scenario described in Chapter 15 could lead to a collision return period as low as 1 in every 14.5 years if there is no avoidance by east-west traffic. This level of risk would be clearly unacceptable.

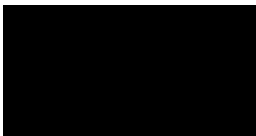
We share the Northern Lighthouse Board view that floating aids to navigation are potentially unsuitable for this area and that direct lighting of the site could inadvertently lead to an increased number of vessels transiting the Inner Sound at night-time. Therefore, the timely promulgation of detailed information, via tools including Notices to Mariners and Navtex, and clear marking of the array (to be agreed with UKHO), including turbine depths, will be absolutely essential in ensuring that vessels can passage plan safely. As noted above, it will be essential that mariners are provided with sufficient levels of information to allow them to safely avoid the tidal array, given that maximum observed vessel draughts in the Inner Sound were recorded as close to 8m.

We support suggestions that construction safety zones smaller than the standard 500m could be applied for if it is successfully demonstrated that smaller zones would reduce navigational risk satisfactorily while allowing a larger proportion of navigable sea room in the Inner Sound to be retained. The relative merits of both 500m zones and smaller zones should be assessed in any future application to the Department of Energy and Climate Change (DECC).

It should be noted that approval for phase one of the project does not automatically constitute approval for phase two. Ongoing monitoring of vessels' interaction with and reaction to phase one will be essential in determining the acceptability of phase two from a navigational risk point of view. Regular consultation with key navigational stakeholders should be demonstrated ahead of application to construct phase two of the project.

The Chamber is willing to provide additional input if required. If you have any questions regarding our comments, please do not hesitate to contact me.

Yours faithfully,

A large black rectangular redaction box covering the signature of the sender.A small black rectangular redaction box covering the name of the sender.

Policy Advisor, Safety & Environment
The Chamber of Shipping

8 August 2012

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Dear Mr Sutherland

MeyGen Tidal Energy Project, Phase 1. Marine Licence and Section 36 Application

I have read the relevant parts of the Environmental Statement and the section 36 application on behalf of RYA Scotland. The Navigational Risk Assessment has been well done and has addressed those issues identified by us such as the effects of swell on the clearance depth.

The application is consistent with the RYA position paper on Tidal Offshore Renewable Energy Installations. We welcome the 'deploy and monitor strategy' to be adopted for phase 1, the continued interaction with NLB and the proposal for an installation specific hazard review workshop.

We therefore have no objection to consent being granted.

Yours sincerely,



PP

RYA Scotland Planning and Environment Officer

Copy To:
Meygen

Meygen Pentland Firth Inner Sound

Taking a recreational vessel or any small vessel of low power through the Pentland Firth especially in an East to West direction needs careful planning. This is due to the Merry Men of Mey tidal race which occurs on the ebb stream (CCC Sailing Directions N. & N.E. Coasts of Scotland and Orkney). At the southern end of the Merry Men the race breaks away from St John's Point at about an hour before the start of the flood. Passage through the Pentland Firth west bound should be taken at this time and this will give an hour of ebb to reach Dunnet. West bound through the Outer Sound on the ebb would be extremely dangerous and on the flood would be impossible for a low power craft.

A voyage plan should take the above into account and this will mean that any low power craft heading from the East coast of Scotland to the West will have to go through the Inner Sound. The Meygen Navigation statement does not indicate whether or not any vessel of the various UK and foreign sail training tall ships or large racing yachts have navigated through the Inner Sound. These craft may have a draught greater than that of the Pentalina.

As stated clearance above the generators is to be a minimum of 8m. The statement although giving a rotor diameter of 20m does not state the hub height. Taking a plausible hub height of 12m and the rotor diameter of 20m then the maximum height will be 22m. Thus a clearance of 8m can only be reached if the unit is in a minimum charted depth of 30m. The plan indicates that there could be units in 25m depth along the southern edge and maybe only 22m close to the Stroma Skerries. If this is to be the case then any unit in less than 30m chartered depth should be marked.

**RESPONSE STATEMENT (RELATING TO TIDAL
STRWEAM ELECTRICITY) ISSUED SEPTEMBER 2012,
BY THE DIRECTORS OF GILLS HARBOUR LTD, (GHL)
GILLS BAY, CAITHNESS KW1 4YB, A COMMUNITY-
OWNED TRADING COMPANY (REG. No 364117)
ADAPTED AS GHL'S STAGE ONE RESPONSE TO
MEYGEN LTD'S TIDAL ENERGY PROJECT, PHASE 1
CONSENT APPLICATION.**

Ambitious, but 'cost-effective and achievable' plans for a major upgrade and expansion at the British mainland's most Northerly seaport are on the cards, its community owners are revealing in an early 'generalised' statement to the Scottish Government's request for response as 'stakeholders' for the MeyGen Ltd's consent application submission.

Those involve a substantial 70+ metre lengthening of the main breakwater/berth at Gills Harbour, on the Pentland Firth coast, primarily using re-cycled materials; dredging to provide a 'turning circle' in quiet waters for 70/90 metre long vessels, plus upgraded facilities in the harbour's Inner Basin to cater at all times for 'tidal stream support vessels' of the 25-metre class.

The chairman of Gills Harbour Ltd (GHL), which belongs to the 600 electors in Canisbay Parish in scattered communities strung along the Pentland Firth's rural southern shore from John O'Groats to just west of the Castle of Mey in Caithness, provided some details.

The first two mentioned are being undertaken by its lessee Pentland Ferries Ltd, while the community company, chaired by Bill Mowat, is to oversee the Basin works.

This comes as a progress report on the largest of the two local-area tidal-stream energy projects was provided by directors and engineers of MeyGen Ltd to local residents at a 'public open day and exhibition' in Canisbay Village Hall.(20.06.12). MeyGen Ltd's presentation of 'consenting documents' for its Pentland Firth Inner Sound project to the Highland Council and to the Scottish Government, with comments called for by the end of September.

The display including artist's impression illustrations of three large proposed new buildings, where MeyGen Ltd intends to 'rectify and transform' the tidal stream electricity generated in the narrow channel between the mainland and Stroma island being brought ashore from 2014 onwards by sub-sea cable to landfalls on Gills Bay.

London-based MeyGen Ltd, owned by investors mainly in the United States, & France (including a big stake by the French Government) as well as the UK, is named after the historic landed estate in Canisbay Parish. Its generating turbines will be fixed to the Inner Sound's seabed, just 1.5 miles from Gills Harbour-mouth. The other tidal-stream energy power-station close to Scotland's North Coast is planned for development from 2015 onwards by Scottish Power Renewables, and it lies just four miles from Gills at Ness of Duncansby, off John O'Groats. Two others, of Cantick Head and Brough Ness are on the Orkney side of the strait. Both of those are within ten miles distance and, if everything goes to plan, all four tidal stream power stations in 'Pentland Firth and Orkney Waters' (PF&OW) should be operational by 2020.

This could be the first phase in the longer-term harnessing of Britain's largest single 'renewables' resource; experts believe that eventually the Pentland Firth could generate as much electricity as six atomic or coal-fired power-stations or more; the Crown Estate has not, to date, made the deeper waters of the Pentland Firth's main international shipping channel available for lease; those are known to contain the largest electricity potential and are conveniently sited in respect of Gills Harbour.

It comes in the season that one of the UK's newest and most versatile 'marine renewables support vessels' has been showing off some of her capabilities at Gills Harbour.

The 24-metre-long 'multi-cat' vessel *Orcadia*, which was reported to have cost £3.5 million when she was delivered in 2011 from Damen Shipyards in the Netherlands, has made two contract calls to the community-owned Caithness harbour in the Summer of 2012.

She is capable of the kind of heavy towing that is likely to be required during the creation of these major sub-sea power stations scheduled to be completed within the next 8 years at a reported cost of over £3 billion (£3,000 million).

The 'out of sight' power stations, constructed as linked 'arrays' on the seabed of the Firth's Inner Sound, at the Ness of Duncansby, & off Orkney's Cantick Head and Brough Ness, will use recently-developed 'horizontal hydro' generating turbines to convert some of the massive amount of 'kinetic energy' in the Pentland Firth's strong tidal streams into electricity for household, business and industrial use.

All are in the Eastern Pentland Firth, the narrowest part of the 16-mile long strait between mainland Scotland and Orkney where the tidal-streams flow most swiftly. The Firth's 30 to 35 metre deep Inner Sound, between mainland Caithness and presently-uninhabited Stroma, is just 1.5 miles wide, while the main much-deeper Firth has an average width of 8 miles.

The combined output by the two groups that have obtained Crown Estate seabed licences off Canisbay Parish for generating 'renewable' electricity+ the two within 10 miles range of the harbour on the Orkney side of the Firth should be c. 800 MW; over three times as much as from Dounreay's now-closed Prototype Fast Reactor, on Scotland's North Coast, just 20 miles from Gills Harbour.

Yesterday Mr Mowat said: "We're very happy to see *Orcadia* using Gills; we have already hosted the broadly-similar *C-Odyssey*, owned and operated by Leask Marine of Kirkwall', also Orkney.

"I'm pleased to say publicly for the first time that our community company intends to develop the Inner Basin of Gills Harbour to allow it to cater for three vessels of this 25 metre class, at all states of the tides

"We anticipate having costings and detailed working drawings to hand within the next few months. We have kept the relevant public agencies informed about this".

The major breakwater extension and the additional 'one-off dredging operation (there is almost no silting in Gills Bay) are both being undertaken by Pentland Ferries Ltd.

Pentland Ferries, whose Managing Director and 'driving force' is award-winning Scottish transport entrepreneur Andrew Banks, operates the successful 15-mile 'short-sea-crossing' from Gills thrice-daily year-round with its 2,382 tonne purpose-designed modern catamaran RO:RO freight and passenger ship *Pentalina*.

The extended breakwater/berth will provide a guaranteed depth of around minus 5 metres LAT (Lowest Astronomical Tides). It will be offset from the present breakwater to allow marine renewables vessels to be berthed at the quayside without interrupting scheduled ferry movements. As with the present breakwater/berth, it will be recycled from an internally and externally strengthened redundant former floating dry-dock, emplaced on a pre-levelled seabed and using rock-spoil dredged from the seabed as gravity ballast.

The planned new c. 100 square-metres dredged 'turning circle' will allow the ferry vessel -- and others of similar size -- to be navigated inward- and outward-bound to/from Gills Harbour in forward motion in full shelter at all times, in all weather conditions,. Turning will involve a combination of ships' rudder, twin or more engines turning propellers in a counter-rotating mode, plus the vessel's side-thrusters (and, on occasions, on-board warping-winch(es)). This will be a considerable asset, especially when strong NW winds are blowing.

The Banks family company's formal application to the Scottish Government's offshore regulation agency Marine Scotland for the Gills works was lodged in Spring, 2012, and it expects to start construction

following late 2012 formal approval in the 2013 season. At present, a sea mammals study as requested by Scottish Natural heritage as part of the application process, is understood to be underway with that company using a suitably qualified chartered environmentalist.

The unremunerated directors of Gills Harbour Ltd have chosen to pitch their main target market for contractors and subcontractors to the tidal stream utilities at the 25-metre-long class of 'multi-task' vessels, following detailed recent discussions.

Mr Mowat said: "The professional advice that we have obtained has underlined our confidence that the Inner Basin can be adapted for this purpose in a very cost-efficient manner.

"Gills Harbour lies at the inland apex of the most sheltered bay on the otherwise 'open' Caithness coast of the Pentland Firth. The port's site is in between the two 'notorious' tidal races that emanate from the Caithness side of the Firth; The Merry Men of Mey, out to the West of Gills Bay and the Bores of Duncansby, lying four miles to the East.

The Merry Men of Mey's 'starting point' is close to the Caithness shoreline c. 1 mile west of Gills Harbour and it veers off in a NW direction as the W-flowing ebb-stream gains momentum to 'span' the 8 mile width of the Firth to Tor Ness on the SW tip of the island of Hoy, Orkney during the twice-daily 12.5 hours ebb-tide cycle.

"Gills Harbour's location means that neither of those potentially-hazardous natural phenomena has to be transited either on the regular ferry routes or by vessels using Gills for operations concerning the sub-sea generating turbines and associated underwater 'infrastructure, in zones where tidal-streams flow at an average rate of around 5/6 miles per hour".

White water breaks every day of the year on the west-flowing ebb-tide at the 'Men', while the Bores, lying off John O'Groats, 'work' on every east-flowing flood cycle. In winter conditions, when those tide-races are opposed by gales and driven waves, multi-directional seas are known to swell up to as much as 12 metres, the equivalent of a collapsing four-storey building.

The former four-term Councillor for NE Caithness on the Inverness-based Highland local authority added: "Gills Harbour is ideally situated to provide both additional safety and comfort for crews, engineers and vessels involved in Pentland Firth tidal stream operations, to substantially enhance overall productivity and to slash costs by allowing smaller vessels to be used than would be the case from other mainland ports, as vessels using those would have to transit the races either inward or outward bound during a normal working day".

“With both seabed licences off Caithness lying so close, there will be considerable fuel savings to be made. This should also be the case for the two seabed lease-holders off Orkney’s south coasts, both of which are within 10 miles of Gills.”

As her name implies, *Orcadia* is owned by a company from the Orkney Islands and she is registered in Kirkwall. Scotmarine Ltd is headed by one of the North of Scotland most prominent entrepreneurs in ‘renewable energy’, Mr Barry Johnston, who has several companies operating in the field.

The nascent ‘marine renewables’ industry is already giving work to over 200 persons in Orkney.

Those involved in tidal stream electricity developments are aware of Mr Johnston as the entrepreneur behind the multi-million pound Scotrenewables prototype SR 250 tidal stream generating set.

Built at the ‘*Titanic*’ Harland and Wolff ship-yard in Belfast, Northern Ireland, Mr Johnston’s Scotrenewables Tidal Stream Ltd’s SR 250 machine, weighing in at 100 tonnes, is the first floating device to send electricity to the National Grid from its sea-floor ‘turret’ anchoring point at the European Marine Energy Centre’s tidal test site, at Falls of Warress, off Eday, Orkney, part of its two years of trials that began 18 months ago.

Already beamy *Orcadia* (she is 9.5 metres wide) has been successfully deployed ‘in challenging conditions’ on installing and maintaining a variety of offshore wind, wave-energy converters and tidal stream devices, and associated sea-bed ‘infrastructure’, including cabling, her owners state.

The vessel has 4 powerful Caterpillar engines giving her a tug’s ‘bollard pull’ capability of 26 tonnes. This allows her to tow barge-mounted heavy equipment in strong currents, which could earlier be only done by using much larger ships.

***Orcadia*’s tasks also involve her use as a floating base for measuring the strengths of tidal streams using ‘Acoustic Doppler Current Profilers’, while she has a through-deck ‘moonpool’ that allows her to act as a diving support vessel, again a task which previously required a substantially larger vessel.**

She can also be configured as a supply vessel, capable of carrying and handling several shipping containers on deck, as well as over 60 tonnes of fuel oil.

The cost of fully harnessing MeyGen Ltd’s Inner Sound concession and Scottish Power Renewables’ Ness of Duncansby sea-bed site + the two

Orkney PF & OW sea-floor lease-sites could exceed £3 billion. (£3,000 million)

“There will only be a viable future for tidal stream electricity as a new industry here, if costs can be reduced, along the lines suggested in the recent report of the UK Parliamentary Select Committee on Energy & the Environment, which took detailed evidence on this issue.

" My fellow-directors believe that Gills Harbour will have a significant role to play in this cost reduction” said GHL’s chairman.

Looking further into the future, Mr Mowat stated that it was quite possible to envisage ‘a completely enclosed Gills Harbour’ with the largest ‘ship-pool’ of quiet waters on the Pentland Firth coast, but so far no firm plans exist for this and will almost certainly be 'need-driven'.

This would add to location’s natural shelter from St John’s Point/Head o’Crees from the prevailing Westerlies; its screening from ‘fetch waves’ by nearby Stroma and the Orkney Islands strung along its whole Northern horizon and the configuration of the coastline eastwards past Canisbay Kirk to the Ness of Huna that ensures that Gills Bay is almost completely free of North Sea origin ‘easterly’ swells, which can close exposed Scottish East coast ports from Wick to Aberdeen.

Gills Harbour had by far the lowest 'wave fetch vector' (at c. 25 degrees out of 360) of any mainland port in the Far North of Scotland; this only direction to which it is exposed is to the NW and this is what the new breakwater extension's alignment is aimed at combating.

And it would also be possible to excavate a deep channel using a large back-hoe dredger to give a guaranteed water depth of minus 7 or minus 8 metres or even more at lowest tides right up to the quay-head at the seaward end of the breakwater extension, where a second Gills link-span 'bridge' could be affixed. Tis is likely to be a safety-driven future feature of the port.

Gills Harbour Ltd is the modern incarnation of two previous un-incorporated local bodies that have run facility since the site and foreshore on which the original 150-yard long pier was built in 1905 was donated to the original Gills Bay Pier Committee by the then-owners of the Mey Estate. Its construction was specifically aimed at diversifying the local economy away from perceived over-reliance on small scale crofting (i.e. peasant) agriculture and it was to have been the first phase of what was described as a 'steamer terminus for the Orkney trade'.

It leases part of its site to Pentland Ferries which has created a modern transport hub there. Its sailings connect with service buses/coaches to/from Inverness, Wick and Thurso.

Gills Harbour's official planning status is:-'Identified as an area to support renewable energy'. As such, it is rated as 'Tier 1' by Government agencies Highlands& Islands Enterprise/Scottish Development International for 'Regional Selective Assistance funding'. This can cover up to 40% of capital costs.

All investments there to date have come from the private sector via Pentland Ferries Ltd or from local community money. ENDS.

Some additional points/specifics for interpretation:

[REDACTED].

a) Pictures of vessel *Orcadia* on www.scotmarine.net etc. Gills Harbour views on www.Caithness.org. Photographer Susan 'Susie' Swanson, (nee MacKenzie) who lives locally on Gills Bay at Warse Mains Farm, should have up-to-date pictures, also from Pentland Ferries Ltd, (both on web;SDM Photographers. See also photo-sequence below.

b) Gills Harbour Ltd (reg. no. 364117) is the modern community-owned incorporated successor to two earlier bodies starting with the Gills Bay Pier Committee over a Century ago. The land (including inter-tidal foreshore) on which the original 150-yard-long pier was built in 1905 was donated by the then owners of the local Mey Estate.

c) This body (GHL), which leases part of its land-holding to Pentland Ferries Ltd, was re-constituted as a 'incorporated' trading business following an address in Canisbay Village Hall by a senior official of Dr John Watt's 'Lands Unit' of Highlands & Islands Enterprise, the Scottish Government's Inverness-based jobs agency, which encourages community land-owning trading companies.

d) Pentland Ferries Ltd, whose managing director is Andrew Banks, also leases adjoining seabed to the North of the historic Gills low-water (LWOST) tide-line from the Crown Estate. The present 116-metre long breakwater and its planned 70+ metre extension will be on this seabed; both are-internally and externally strengthened re-cycled redundant floating dry-docks, emplaced on a pre-levelled seabed, and using many thousands of tonnes of dredged bedrock 'spoil' as gravity ballast.

e) Pentland Ferries Ltd carried over 100,000 passengers (31.03.2011 to 31.03.2012) plus much 'essential' freight (e.g. inward ensuring that islands supermarket shelves remain fully stocked, providing materials

for the important island building and construction trades; outward exports of foodstuffs including live shellfish in aerated salt-water 'vivier' trucks & farmed salmon both for UK and European markets, prime chilled Orkney beef products and live lamb consignments), on its modern purpose-designed 2,382 tonne catamaran ROPAX ship *Pentalina*.

She provides a year-round, thrice-daily, service (4 return crossings daily in summer) across the channel's historic 'short sea route' to St Margaret's Hope, on Orkney's main roads network, 15 miles away. This is Scotland's most successful mainland to islands service as it has not had any capital nor revenue support from UK taxpayers money. It is the shortest, smoothest and quickest trans-Pentland route, as only 2.5 miles of this seaway (between the mid-Firth islands of Stroma and Swona) is exposed to the full force of incoming prevailing Westerly gales and swells.

The medium-speed vessel's open aft-deck configuration allows 'volatile' loads of 'lifeline' road-tanker petroleum fuel products also to be regularly carried.

f) Its rival is the 28-mile crossing from Scrabster in Caithness to Stromness in Orkney and sailed by the 8,780 tonne *Hamnavoe*. She carried 130,000 passengers in the same time-period on a seaway that has been used for scheduled trans-Pentland trips since 1945. It is correctly described by Rob Gibson, the local MSP (Member of the Scottish Parliament), as an 'open ocean route', as almost the entire *Hamnavoe*'s crossing is exposed to the prevailing Westerlies, winds and swells driven by 'atmospheric lows' sweeping in from the Atlantic.

This route, operated by SERCO plc (trading as NorthLink Ferries Ltd) from July 2012 will be massively subsidised for the next six years. It could not continue in its present form without regular infusions of taxpayers' money. Recently a well-respected Scottish transport consultant put this at c. £230:00 per passenger return trip, based on the SERCO tender figures of c. £13 million per annum for its Pentland Firth route.

This compares with a commercially-set return fare of £28:00 on the Gills route. Freight on the trans-Pentland crossing is not subsidised by Government revenue support.

The (presently-unused) route from Gills Harbour to Stromness is six miles shorter than the above and is far less exposed, as half the journey's length is through Scapa Flow, an 'inland sea' surrounded by islands, including Hoy, that shelter it from Atlantic storms.

g) Gills Harbour Ltd's (GHL's) company articles closely reflect the 'aims' of the Committee behind the original Edwardian 150-yard-long

Pier. It was specifically built to provide job opportunities to diversify the base of the local economy from 'crofting'. (i.e. peasant-scale agriculture).

The original pier was envisaged then as being the first phase of 'a steamer terminus for the Orkney trade'. It also aimed at providing enhanced facilities for local 'crofter-fishermen and better goods-transport to then-inhabited Stroma Island.

Providing or enabling 'sustainable' employment opportunities locally and in the wider North of Scotland community and beyond', remains GHIL's watchwords. It sees 'tidal stream electricity' as a one-off opportunity for long-term, not just construction, skilled employment.

The electricity from the Firth's turbines is expected to be sent, perhaps by underground cable, from Gills Bay to nearby Philip's Mains in East Mey, where SHETL (Scottish Hydro Electric Transmission Lines) plans an electricity 'sub-station', in a new building 180 metres long.

The power will flow from there by wooden-poles lines to an upgraded pylons Grid from Britain's now-shut 'Prototype Fast Reactor' at Dounreay (20 miles west of Gills Bay) to Beaulieu, near Inverness and then on to Denny, near Stirling. Longer-term, there are plans for a HVDC (High Voltage, Direct Current) grid-line cable laid on the seafloor of the Moray Firth from Caithness to near Elgin, Moray and tying-in with 'renewable' electricity from Scotland's Northern Islands. HVDC substantially reduces transmission losses on long lines from the more familiar AC (alternating current), but with initially higher capital costs. Early electricity from the Firth may be sent via the wooden-poles line from Upper Gills to Hestigrew (Bower, Caithness) where an upgrade to boost its capacity 33kV is proceeding.

h) Canisbay Parish, which contains John O'Groats, is the most remote 'unit' on the UK Mainland. This is a traditional 'crofting' (i.e. peasant-scale agriculture) rural area of scattered homes and small communities. Its 350-year-old 40-pupil parish Primary School, established in 1642, is under current threat of closure from the local education authority, the Highland Council.

De-population of rural areas in the North of Scotland has continued apace, and there are now just over 30% of the total of Canisbay parish residents than was the case when the 'Edwardian-era' original' Gills Bay Pier was built specifically to diversify the local economy from perceived over-reliance on small-scale agriculture in an area remote from major populated markets.

j) Gills Bay played an important, if little-known, role in kick-starting Britain's -- and the World's -- first Industrial Revolution for a century onwards from the early 1700s. This was from its exports of semi-

manufactured blocks of soda ash. Seaweed was carefully harvested annually by sickle mainly by local women-folk from its broad inter-tidal zone (c. 200 metres wide, locally known as the 'Braid Ebb'), air-dried and then molten in Bay-side kilns, fired by locally-available high-quality peat deposits. The resulting, cooled and solidified alkaline blocks, sent out directly by sailing ship, played a key part in the establishment of Britain's earliest chemicals industry, used in the production of 'fast' dyes for textiles and for soap-making, both essential for cloth weaving/clothing manufacture. Gills Bay soda-ash was also used in early commercial-scale British glass-making.

k) Historians believe that around 50 persons were employed there from c.1720 onwards. GHL's directors have a target figure of replicating this number of employment opportunities created or enabled in and around the modern and upgraded Gills Harbour in the first quarter of the 21st Century.

Tourism at Gills Bay dates back to the Medieval era, when it was an important departure-point for pilgrims to the relics of St Magnus the Martyr in his shrine, the magnificent Norman-arched Viking-era Cathedral in Kirkwall, Orkney, 18 miles away. Crossing the 'tempestuous' Firth then was said to be an Earthly metaphor for the final journey from mortal life to Heaven. From time to time 'Indulgences' were sold at 'Mansie's Kirk' (as it was known in Canisbay and the neighbouring Dunnet parishes, which provided revenues for the fabric and complement of the great Church through grain export) to supposedly speed-up that 'after death' experience.

In 1496, Scots King James IV, granted a ferry monopoly to the Dutch-origin Groat (originally de Groot) family and arranged for the local Earldom to 'convey' to that family two small estates at the narrowest eastern end of the Pentland Firth at Warse and Duncansby, both in Canisbay parish, Caithness. The Duncansby sailing point became known as John O'Groats House, after the ferry inn (i.e. 'house') kept there for 250 years by members of the Groat family. Warse Haven is the second inlet at the inward head of Gills Bay, just 200 metres east of the present Gills Harbour and remained with the trading family until the mid-18th Century.

Orkney had been incorporated into the Scots King's realm less than three decades earlier as a result of a deal brokered by the King of France. The Danish Crown could not come up with a promised golden marriage dowry to accompany its Princess as Scots Queen, and instead 'pawned' its Orkney and Shetland lands.

In common with other non-urban public transport services in the North of Scotland, there is a very distinct skewing of demand on the Gills crossing in favour of summer use, in comparison to February.

l) A photo-sequence showing a 34 m trawler battling though one of the tide-races is available. The sequence of 4 shots illustrates the potential hazards and discomfort to those on board of having to transit through one of the Firth's tide-races in winter conditions with tidal streams opposing incoming swells and high winds; the one in question from the mid-1990s shows the homeward-bound (from Iceland fishing grounds) Belgian *Amandine* battling though the Bores of Duncansby during an east-flowing flood-tide stream flowing fast into the teeth of a SE gale and the resultant 'short-sharp' swells rolling in from the North Sea. The first three pictures are taken from low cliff-top above Sannick Bay, near Duncansby Head, and the fourth shows the vessel (now a museum ship in Ostend, Belgium) wallowing in the high seas after she had rounded Duncansby Head.

Conditions at the Merry Men of Mey can be worse than portrayed in the sequence. This is because the prevailing Westerly air-flow, carrying atmospheric-depression 'lows', regularly sweeps in from across the Atlantic to blow over the North of Scotland. The 'fetch' of incoming swells from the wide Ocean is much longer than from the North Sea. This natural phenomenon spans the entire width of the Pentland Firth from c. 1 mile west of St John's Point (the Western extremity of Gills Bay) to Tor Ness in Hoy (Orkney) during all west-flowing, twice-daily, ebb tidal streams for c. 12.5 hours every day. There is no direct road access to St John's Point (which, in any case is at a much lower elevation than Duncansby Head, so no equivalent land-based 'action' pictures of the Merry Men of Mey are available.

The point however is clear; with white-water breaking or over 12 hours on every day of the year in either 'race' on the tide-cycle, those do no need to be transited by any vessel using Gills Harbour, coming or going to any of the four Crown Estate tidal stream seabed concession in the East Pentland Firth, where all are sited.

This is not the case for vessels using any other port on the Scottish mainland.

m) Gills Harbour and Bay is widely acknowledged (including by some relevant official bodies) as having an important safety, cost-effective and convenience attributes for servicing the two near-shore tidal-stream seabed sites so far leased by the Crown Estate for electricity generation off Canisbay, Caithness. This could include possible emergency turbine-retrieval facilities. Its use could also provide cost-savings for the operators of the Firth's two tidal stream 'arrays' off Orkney, as some components needed there can sensibly be transported via Gills.

n) For more than 250 years, the Pentland Firth has been the main 'choke-point' on the 'great circle' cargo-shipping lanes between NW Europe/The Baltic ports/Eastern UK and the Americas and sometimes beyond. As such, it is an important conduit for national and international

trade, including those liquid chemical cargoes judged by the European Commission as being too hazardous for inland rail or road transport.

The Firth's main channel is 4 miles wide between Duncansby Head & the mid-Firth Pentland Skerries (two miles from the latter to South Ronaldsay, Orkney), narrowing to 2.5 miles on the principal through shipping lane between the mid-Firth isles of Stroma & Swona, with water-depths down to 90 metres.

In the 18th and 19th centuries there was much interaction between transit shipping and local seafarers, through (usually compulsory) pilotage.

Marine insurance underwriters, mainly in London, demanded that shipping companies employed a local pilot to take temporary command of a windjammer and sail her safely through the Firth's hazards, on pain of removing insurance cover from that part of the voyage. Such cargo ships could be sailed (by tacking, despite the confined width of the Firth) against the wind, but never against the tidal streams.

This was the 'golden rule' of pilotage, an enterprise that gave rise to a great body of local knowledge of the Firth's widely-varying tidal characteristics in all weather conditions. Most of the seafarers involved in this valuable trade to the local economy then lived on crofts and many also participated in various fishing activities locally and (seasonally) beyond).

Further know-how about the Firth's tide-streams came from experience gained by local men in the historically important Firth hand-line fishing for cod (for sun-dried export to the Mediterranean lands often, but not invariably salted after on-board bleeding (to ensure white flesh texture) from local clinker-built 'dories' known as yoles. Those wood-built little boats (often 6 m or even less) were built 'beamy' to counter multi-directional sea-states and were also used to access the sailing cargo-ships (as above). The Pentland Firth, including Inner Sound, cod-fishing was most productive in the short periods of 'slack water' when the lines' stone (or later) lead sinkers would drop vertically, plumb to the sea-floor.

This was even then known to be mainly swept bare by the currents; the lead-cast ones had to be protected on the lower side by a tougher metal to stand up to the repeated impacts with the bare bedrock (flat scraps of old iron or coins were used).

From there, lines had to be hauled back one or two fathoms (c. 2-4 metres) to get the hooks into the main 'catching zones' with (waterproof) seabirds' feathers often used as 'flies' to lure the swimming cod; ling, a related white-fish, was a useful by-catch. It was less valuable in the export markets when preserved similarly to cod, but was a valued key food in the local diet.

Good cod-fishers were able to move the positions of their yoles quickly (by rowing fast) to maximise the period over 'slack water' parts of the Firth or its Inner Sound. Pentland Firth cod are renowned for their firm white flesh, said to be caused by the 'exercise' that the fish's muscles had to use in swimming against the tide-streams.

Some of this residual knowledge persists amongst modern-day folk, including several associated with GHL. Cod could also be caught in shallower waters (off the SW tip of Stroma was a favoured spot) but fish from there tended to be discoloured brown by regularly swimming amongst kelp-fronds (local dialect 'reid-waar' cod) and were less valuable. Those were also prone to worm infestation of their flesh, correctly blamed on seals, with the cod eating the mammals' droppings.

O) If the Pentland Firth is to make a substantial (e.g. 6,000MW to 8,000 MW or more) contribution to Scotland's and the UK's affordable, carbon-free, electricity needs from (say) 2030 onwards, then the ports' infrastructure, (including Gills Harbour/Bay with its unique Mainland position adjacent to and with convenient all-weather access/egress to/from all the likely East Pentland Firth 'tidal stream electricity 'fields') being provided or upgraded in the first half of the 21st century's second decade must be proven able to safely and successfully 'service' the early years of near-shore subsea power-stations, such as at Inner Sound and Ness of Duncansby.

This must be in all weather and sea-swell conditions, particularly as the early generating devices may be emplaced with as little as two winter-seasons of prior sea-water immersion in realistic conditions. This should be regarded as the minimum period before any substantial turbines deployment.

This is Gills Harbour Ltd's 'official' position, as enunciated by our director William Simpson to the Crown Estate's Alasdair Rankin, during the sea-bed leasing process, but before it was finalised. Mr Simpson is the sheep farmer on Stroma Island and operates a registered fishing boat from Gills Harbour. Descended from many generations of Stroma seafarer/ crofters, he is one of the most knowledgeable persons on tidal streams on the Southern shores of the Pentland Firth. He is the chosen skipper of the m.v. *Aurora*, the research vessel operated from Gills Harbour by The Environmental Research Institute at the Thurso, Caithness, campus of the University of the Highlands & Islands. As such, he has got to know personally many of the 'academic' scientists, engineers etc. involved in tidal stream electricity-related research in the Pentland Firth and has, as appropriate, shared his knowledge with them.

All marine energy device design teams want to provide turbines that have only to be removed from the sea during planned summer maintenance 'outages', being perhaps monitored from 'screens' in shore buildings by 'remote' sub-sea cameras at all other times.

But the Pentland Firth's natural environment is challenging, so utilities should perhaps consider a need to plan for 'quick intervention' to stabilise turbines, costing as much as £6 million/£8 million each, by 'events' that have not been anticipated; e.g. collision with substantial pieces of flotsam/jetsam, including loose fishing nets/ropes, damage by unexpectedly-strong lateral wave-forces or metal fatigue, perhaps involving shearing of components. The weather events of December 2011/January 2012 were extreme by recent standards, driven by a quick succession of atmospheric pressure 'lows' tracking in from the Atlantic Ocean in quick succession for c. 55 days continuously and the resultant prolonged heavy Westerly swells with maximum disturbance in the Merry Men of Mey on the ebb-tide cycle.

All of this begs the question as to whether an emergency near-site 'device-retrieval facility' (or plural) with direct access from the sea (e.g. by scuppered slipway or hydraulic 'link-span' bridge or both) should be made available from the start, one that could double with (and thus have costs partially-shared with) those planned for routine summer maintenance programmes, or be common-user facilities amongst the Firth's tidal-stream utilities. This would also be sited so as to eliminate the need for a damaged turbine to be towed (on a barge?) through one or other of the tide-races. The early MeyGen Ltd. official consents should lay down a parameter pattern applicable to all following, to ensure best, most economical and safest practice is followed subsequently by all parties concerned for it or for developments by it or by other PF & OW seabed electricity lessees in future.

All of the above should be done by Marine Scotland in a manner that gives confidence to the really important key third-party 'players', including modern-day marine insurance underwriters, the Government's Health & Safety Executive (HSE) and the UK's Maritime & Coastguard Agency (MCA,) and, not least, to the on-board crews and engineers serving/servicing the sub-sea turbines. Such well-qualified persons will require as much sea-comfort as possible, as this will act as an aid to the recruitment and retention of skilled staff by the tidal stream developers and their contractors..

It is reasonable to anticipate that much practical learning by engineers and technologists will follow-on directly from the early device emplacements in the two Crown Estate leased sites off Canisbay.

As Mr Simpson, (as above) also stated as regarding tidal stream developments 'it is more important to get it right than early'.

p) In an era of near instant communications, public relations (PR) is near-certain to become an issue, whether one approves or not.

This is especially as 'world-first' claims to 'excite' media outlets are likely to be made by various companies involved, as electricity

generation commences from the technology of today's tidal stream turbines. Good PR implies keeping unnecessary 'carbon-miles' to the absolute minimum. But this is a benefit, as it will result in real savings in sea-trip miles and thus cut the costs of fuel burned.

Cost reduction will be vital if the Pentland Firth is to fulfil the 'electric' role that playwright/philosopher George Bernard Shaw foresaw for it back in 1908, in his Fabian Society pamphlet, following a crossing to Kirkwall (Scapa Bay) from Caithness for an Orkney trout-angling holiday.

The sales-price of tidal stream electricity is near-certain to be key to the Pentland Firth's 'green energy' future from c. 2018 onwards. (i.e. as in the recent House of Commons Energy and Environment Select Committee's cost-reduction recommendations).

This means, amongst other things, the regular use of smaller, more fuel-efficient vessels throughout the process plus perhaps experimentation with adapted but innovative mid-water or flotation turbine-emplacement technology to slash to zero (or near-so) the need/desire to hire 'Giant-class' offshore oil & gas industry 'well intervention' ships, that can cost up to \$140,000 per day-rate charter.

But this need not compromise safety. Although no-one would wish to be serving on board 25m long vessels, ploughing through the Merry Men of Mey in the 'not uncommon' winter eight-metre confused-direction swells (the height of two double-decker buses), such a scenario should never be necessary.

There should no be such a thing as awaiting 'slack water' and 'the flood-tide setting-in', as this would be a recipe for diminishing productivity and thus adding un-necessarily to costs, if other Scottish mainland ports other than Gills Harbour are to be routinely used.

Such smaller powerful vessels can and should be available ex-Gills Harbour to avoid either of the above scenarios in safety and with reasonable on-board comfort.

Q) There is perhaps a useful analogy to be drawn here with Pentland Firth ferries. The fuel-efficient *Pentalina* (70 m) never has to transit a tide-race, yet she is capable of carrying almost as much cargo of the 119m *Hamnavoe*, which broadly burns as much fuel in a three-trips day as does the former in a week.

The latter is much larger because, if she is to keep to an all-year-round timetable schedule, she has to be capable of negotiating not only the Merry Men of Mey (on the c. 40 occasions per annum when she is sailed via Cantick Head/ Scapa Flow to escape a 'pounding' West of Hoy) but to regularly face 26+ miles of the type of heavy Atlantic swells on her regular seaway that excite innovators in 'wave energy converters'.

In vicious winter conditions, she can find no respite with the onset of the west-flowing ebb-stream. In the waters of Pentland Firth to the east of the Merry Men of Mey, that active phenomenon acts as a 'floating breakwater' to dissipate and take the force right out of the Atlantic-origin waves.

In extreme conditions on 21.01.12, the master of *Hamnavoe* had to use the 'Short Sea Route' for his return trip to Stromness, his vessel having suffered a vicious pounding on the inward trip to Scrabster. For the first time since the introduction of RO;RO ferries in the early 1970s, the vessel used the Inner Sound (c. 0.8 miles off Gills H) and continued Eastwards until Duncansby Head prior to crossing to Scapa Flow via Hoxa Sound (east of Swona island & the Cantick channel) and from then on in sheltered to Stromness.

The smoothest ferry route to Orkney (i.e. ex-Gills Bay) is also the quietest seaway from the Scottish mainland to any of the four Crown Estate tidal stream seabed leases in the Firth so far awarded.

I) The unremunerated directors of GHL eschew 'protectionism', recognising that devices are near-certain to be assembled with components from 'the world-wide supply-chain'. They have consciously decided to place 'employment opportunities locally' in front of any payments for disturbance etc that are a feature of wind-farm developments. This is in recognition of the fact that electricity generated locally in the initial years is likely to be comparatively expensive.

They would not necessarily regard Pentland Firth energy-related jobs elsewhere in Highland (i.e. Cromarty Firth/Thurso Bay) as being 'local' in the context of its 'company articles'. The same may apply to Lyness, in Hoy, although Mr Banks told select committee Westminster MPs that he would consider sailings to there from Gills H 'when demand materialised'. Future trans-Pentland commuting from Gills harbour may be possible.

S) The 'Magee Hypothesis' postulates that advantage can be taken by tidal-stream electricity generators of the widely-varying high-water times in short distances both laterally along the Caithness coastline as well as outwards from the shore to the mid-Firth.

Named after Gills Harbour's Billy Magee (who has spent a lifetime operating traditional yoles in the Inner Sound) it postulates that advantage can be taken of the above by linking arrays in judiciously chosen, but separate, sea-bed locations to produce 'base-load' electricity. Such an output is considerably more valuable than supplies liable to interruption, albeit at known times. (e.g. at 'slack water')

If fully proven, this could be an important factor in the longer-term future potential of Pentland Firth electricity, although significant additional technological challenges need to be overcome to provide robust generating sets for seabed installation in 80/90 metre deep waters beneath its major international shipping lane.

However, ‘templates’ for such future developments should be set during the harnessing of the two Crown Estate lease sites off Canisbay.

GHL directors believe that Gills Harbour and Bay will have a significant long-term role to play in helping to secure ‘affordable’ renewable electricity firstly from the two local sites, followed by the main Pentland Firth later.

t) Gills Harbour, otherwise known as Gills Bay Harbour, is locally sometimes called ‘Canisbay’s People’s Port’, because it belongs, through the ‘mutual’ company Gills Harbour Ltd, to the 600 electors living close to the Pentland Firth’s Caithness (i.e. south) coast, in Canisbay parish.

It is the most Northernmost sea-port on the British mainland and thus it is right on the ‘front line’ of tidal stream electric sub-sea power-station developments. ENDS

The Scottish Government
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AB11 9DB

Hazardous Installations Directorate

Dean Moffat

Chemical Industries Division
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Tel: 0131 247 2000
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<http://www.hse.gov.uk/>

HM Principle Inspector of Health & Safety
Mrs Jo Walker

Date 23 August 2012

Our Ref. DM/EIA/Inner Sound Pentland Firth/4.2.1.1701.

Your Ref. 009/TIDE/MGIS1 - 6

Dear Sir or Madam

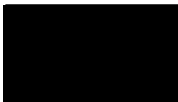
**ENVIRONMENTAL ASSESSMENT FOR PROPOSED CONSTRUCTION OF A TIDAL ARRAY INNER
SOUND OF THE PENTLAND FIRTH**

Thank you for your letter enclosing a copy of the environmental statement for the proposed development.

Environmental Impact Assessments are concerned with projects which are likely to have significant effects on the environment. HSE's principal concerns are the health and safety of people affected by work activities. HSE has no comments on this environmental statement.



Yours faithfully



Dean Moffat
HID CI1B Edinburgh

Mr Andrew Sutherland
Marine Scotland
Scottish Government

By email:
ms.marinelicensing@scotland.gsi.gov.uk

Longmore House
Salisbury Place
Edinburgh
EH9 1SH

Direct Line: 0131 668 8657
nicola.hall@scotland.gsi.gov.uk

Our ref: AMN/16/H
Our Case ID: 201202759

12 September 2012

Dear Mr Sutherland,

**The Electricity Act 1989
The Electricity Works (Environmental Impact Assessment) (Scotland)
Regulations 2000
Section 36 Application for the Inner Sound of the Pentland Firth Tidal Array
Marine (Scotland) Act 2010**

Thank you for your letter of 19 March 2012 and the Environmental Statement (ES) for the above development proposal. For information, we were also consulted directly by Highland Council under the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2008 on the land between Ness of Quoyoys and Hill of Rigifa Huna and I am therefore sending them a copy of this letter for information.

This response covers our comments under the terms of the above regulations and concentrate on our statutory remit for scheduled monuments and their setting, category A listed buildings and their setting, Inventory gardens and designed landscapes, Inventory historic battlefields and designated wreck sites (Protection of Wrecks Act 1973). In this case, our advice also includes matters relating to marine archaeology outwith the scope of the terrestrial planning system. The relevant Council's conservation and archaeology services will also be able to advise on the adequacy of the assessment, the likely impacts and the mitigation proposed for the historic environment.

Historic Scotland's position

In summary, we agree with the findings of the assessment that there will be a significant impact on Canisbay parish church/kirk and graveyard (HB Num 1795). However, we have concluded that impact is not at such a level to warrant an objection. We are also content that impacts on other terrestrial cultural heritage features within our statutory remit are not likely to be significant. In addition, we are broadly content with the findings and approach of the assessment on marine archaeology, providing a reporting protocol is put in place for handling any archaeological discoveries. Our detailed comments on the ES and application are attached as an annex for information.

I hope this response is of assistance to you.

Yours sincerely,



Nicola Hall
Senior Heritage Management Officer, Strategic Team

CC The Highland Council, Glenurquhart Road, Inverness

Annex

The Environmental Statement (ES)

I welcome that the ES is clearly presented and with the level of information contained in it. I have concerns however with some of the statements made in the criteria for assessing the sensitivity of sites. For example, the assumption that cultural heritage features that are sub-surface or do not show on the ground and those which are not highly visited, are not sensitive to impacts on their setting.

Simply for information, the Scottish Historic Environment Policy (SHEP) was updated in December 2011: <http://www.historic-scotland.gov.uk/index/heritage/policy/shep.htm>

The Planning Application

I understand that the development proposal comprises phase 1 of the on and offshore elements of a tidal array which will be located 2 km from the coast of Caithness. The array comprises up to a total of 86 turbines which will be fully submerged, with each turbine having its own export cable to shore. Cable landfalls will comprise sub-surface Horizontally Directionally Drilled (HDD) and an onshore Power Conversion Centre (PCC) comprising 3 buildings will house the infrastructure necessary for converting the electrical output from these cables. I note that the landfall and onshore infrastructure will be located either at the Ness of Huna or the Ness of Quoys, and that underground onshore cables will export the power to the grid.

Onshore Cultural Heritage – Ness of Quoys

Canisbay parish church/kirk and graveyard (HB Num 1795) [ORCA 53]

The ES considers that potentially the greatest impact is likely to be on this site. It is identified specifically because of the potential impact on subsurface archaeological remains identified by geophysical survey south of the building and east of the kirkyard and on site ORCA 54 which site ORCA 53 is built. I understand that targeted geophysical survey is proposed to manage or mitigate the impact.

Impacts on the relationship between kirk and the B listed East Canisbay Manse [ORCA 59] are also considered in the ES, and I note that the design ensuring there will be no interruption of the key view between these two is considered to be appropriate mitigation for any impacts.

Viewpoint 11 (Figure 19.10) illustrates the view towards the 3 PCC buildings from the graveyard at a distance of 100m and the ES considers the impact to be significant. The siting and design of these buildings is considered in the ES to be appropriate mitigation, although I note that the residual impact on the kirk from development located in the Ness of Quoys remains significant in the ES. The potential operational noise levels from the 3 PCC buildings on the church are also considered.

As the development will be clearly visible from the kirk and burial ground at a distance of approximately 200m, we consider that there will be an adverse impact on its setting. However, we welcome the changes in the design of the onshore infrastructure in this area following the EIA assessment to ensure that Canisbay Parish Church is not challenged by the scale of the proposed buildings in the local landscape, and when viewed from the sea. Therefore, we agree that there will be a significant impact on Canisbay Parish Church, but consider that the impact is not at such a level to warrant an objection to the proposal.

Other cultural heritage features assessed in the ES

I note that significant impacts have been identified for the following sites:

- St John's Point, fort & site of St John's Chapel (Index No. 2689) [ORCA 21 & 22]
- Castle Mestag, fortified sea-stack, Stroma (Index No. 9763) [ORCA 486]
- Girnieclett, mound 300m ESE of Mell Head, Stroma (Index No. 9764) [ORCA 487]

I also note that no significant impacts on the following sites have been identified in the ES as they lie outwith the ZTV:

- Castle of Mey (HB Num 1797) and its Inventory designed landscape [ORCA 0]
- Warth Hill, cairn 2000m N of Freswick (Index No. 503) [ORCA 475 & 476]

Onshore Cultural Heritage – Ness of Huna

I note that no significant impacts on cultural heritage features have been identified in the assessment from development in this location.

Offshore Cultural Heritage

I note that no significant impacts on submerged landscapes or prehistoric cultural remains have been identified in the assessment area. I also note that no shipwrecks or aircraft crash sites with known locations have been identified in the development area, and that none have been identified through analysis of the geophysical survey data. In addition, no significant impacts on the survival of wreckage have been identified within the lease area due to the conditions and through analysis of the geophysical survey data, although a large number of anomalies with medium to high potential of being cultural have been identified across the whole of the survey area.

The assessment concludes that only 34 geophysical anomalies may be significantly impacted, directly and/or indirectly by the development proposal. If they cannot be avoided, the assessment recommends that these are investigated further before offshore construction commences in order to evaluate their cultural heritage significance and, if necessary, devise appropriate mitigation strategies. I note that this includes scour monitoring, the reporting protocol for accidental discoveries, and (if necessary) wreck survey, salvage, or intrusive archaeological evaluation.

In summary, we are broadly content with the findings of the assessment and with its approach, providing a reporting protocol for the accidental discovery of marine archaeology during development, maintenance and monitoring is put in place as it is it slightly unclear from the ES if this is a commitment or just a recommendation.

**Historic Scotland
September 2012**

Marine Scotland
Licensing Operations Team
MS-LOT
PO Box 101
375, Victoria Road
ABERDEEN
AB11 9DB

September 3rd, 2012

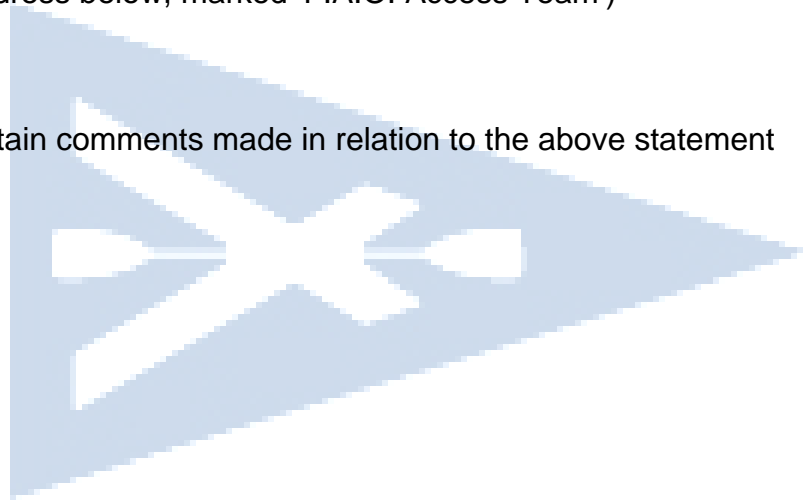
Dear Sirs


**MeyGen Tidal Energy Development Phase 1 Environmental Statement
Tidal Array, Inner Sound of the Pentland Firth**

(Please note that further communications relating to comments by the SCA should be sent to the address below, marked 'F.A.O. Access Team')

The following pages contain comments made in relation to the above statement

Yours sincerely




SCA Board Director
Access and Environment

MEYGEN TIDAL ENERGY DEVELOPMENT

The SCA fully backs up the detailed comments made by Pentland Canoe Club, who submitted a very comprehensive letter date 31st August, posted 3rd September.

It is not intended to repeat all of the comments here, as the club is in a very good position to comment, due to their geographical location.

We would, however, stress the point made about the depth and variety of information concerning sea kayaking in Scotland, which is an enormous activity in terms of numbers, with the Orkney/Shetland area a close third in terms of numerical sea kayak activity after the Argyll coast, and the Skye area, in Scotland.

It has appeared in many other consultations that developers HAVE NOT availed themselves of current and published information with regard to sea kayaking, including this proposed development.

This issue refers to;

Desk-based study – Para. 15.12

Field Survey – Para. 15.44

Navigation features – Para. 15.29

Recreational Vessel activity Analysis – Para. 15.60 – 15.64, and Figure 15.14

There are also unresolved issues in relation, we suggest, to;

Impacts Nos. 15.1, 15.2, 15.4

Overall, we would like to state authoritatively that sea kayaking is an all-year round activity, although predominant in summer months; it does not follow either routes or ports as with larger, either sailing or motor craft ; it takes place in shallow water; in areas of rough water; and hugging the shoreline is often an absolute necessity.

As stated, areas of sea kayaking interest have been included in comprehensive guidebooks (mainly published by Pesda Press, covering all of the British coastline). These guides are read by kayakers from all over the world, and each year many British and European sea kayakers come to Scotland to sample the challenging conditions. Therefore, the information available on any dangers or restrictions, both in construction and maintenance, has to be directed at these members of the public.

The SCA can do its best in attempting to publicise such by way of its website, but as a Sports Governing Body, this is not our main role, and we are not funded to carry this out either.

Points have also been made about contact with Governing Bodies in the other Home countries of the U.K., and this is also a useful idea.

Finally, the importance of casual and informal kayaking to the general tourism trade cannot be stressed enough, and issues of access, temporary prohibition, and up-to-date information warrant future in-depth discussion.

MeyGen Inner Sound ES - Section 9 physical environment and sediment dynamics


This section of the ES was very comprehensive, interesting, and was a pleasure to read. The modelling results presented are by far the most comprehensive of any wave and tidal ES received to date. This is welcomed as it provided a solid evidence base by which to make impacts assessments. The professional presentation of the results gave me confidence in the methodology and results. I therefore have no major comments or concerns. Below are some comments which may help with the decision making process within LOT.

I was particularly impressed with the wave modelling and analysis which included wave-current interactions. At first look this may appear to be a change in the wave climate (Figure 9.17). I agree that on average, across the sound, this is not the case and that it is the spatial distribution of wave heights that is changed. This is pointed out in the ES. It is also worth noting that the 2D, depth average, nature of the model is likely to overestimate any change to the spatial distribution of wave heights due to wave-current interactions. It is possible that the change in the spatial distribution of wave heights may lead to wave driven sediment transport processes occurring under long wavelength waves over the sediment patches in the area. It would have been interesting to see an equivalent table to Table 9.16, but any changes are likely to be negligible. These very minor, but interesting, points are addressed by the impressive sediment transport modelling work. Whilst there does appear to be changes in the sediment transport during storms, it is important to realise that these are relatively small changes predicted using very conservative (overestimated) model outputs (due to the depth average assumption) simulating a rare, and extreme, storm event. I therefore agree with the ES in that any changes are negligible.

Having looked briefly at other sections within the ES, I was pleased to see that there is some reference to the findings of the physical processes sections. For example in 10.87 the results from the hydrodynamic modelling are used as evidence for the impact on the benthic community being minimal.

Minor points

- Figures 9.6 and 9.7 – The elevation is probably relative to mean sea level rather than LAT as quoted.
- The deployment of an ADCP for monitoring and data collection to validate the modelling of energy extraction is a good idea.


31 August 2012

009/TIDE/MGIS1 - 6: MSS comments to MS LOT: Marine Licence And Section 36 Application For MeyGen Tidal Array and associated appendices

Chapter 9. Physical environment and sediment dynamics

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- The deployment of an ADCP for monitoring and data collection to validate the modelling of energy extraction is a good idea.

Chapter 10. Benthic habitats

10.57 (Page 16)

The removal of the kelp should be considered a significant local impact

10.97 (Page 20)

The accumulation of dead bivalve shells (*Mytilus*) at the foot of the structures may be problematic. What are the antifouling treatments and are they 100% effective?

10.7.5 Impact: Antifouling (Page 20)

The statement that the effects of the antifoulant system is negligible cannot be supported until the details of the antifoulant system to be used are known or decided upon

10.121 (Page 22)

Reef habitats and other UKBAP habitats are present and may require protection. These may qualify for formal designation, has this been discussed with relevant advisors?. The contractor keeps stating that there are no areas of conservation interest or any that require protection in the development area. This may be true but the habitats are of importance locally.

Benthic Survey for Phase 1 Report

Section 2. Methods

2.1 Introduction

Point 3 Why are they using a pipe dredge? A mini Hammon grab or possibly a Shipek grab would be more appropriate.

2.3.2

Again, why are they using a pipe dredge? Two replicates seems a bit low, I would suggest. a minimum of 3

2.7 Data Handling and Analysis

Remove name "Christine Howson". Details of the univariate and multivariate tests to be applied should be provided here.

Which versions of ArcView and Excel were used?

Figure 3 (Page 8)

There is a gap in the sampling from the SW of the lease area. I can see that the substrate in this area is the same as that covered by other transects in the area but there should have been some sampling - one transect at least.

5.2 (Page 31)

Last paragraph The unidentified amphipod should be classified as far as possible, especially if it is a member of the Bogidiellidae. The amphipod may be of conservation value.

Chapter 13. Fish ecology

In general the developer as adequately assessed the potential impacts and we agree with the mitigation measures proposed as a conservative approach. However we do have the following comments to make.

Introduction and baseline

There are several discrepancies in Table 13.2

- Spurdog and Spiny dogfish are the same species and do not need to be mentioned twice.
- Several species are missed off the PMF list. These include cod, herring (juveniles and spawning adults), sea trout, spurdog, whiting (juveniles).

13.5.3

The developer has assessed spurdog and spiny dogfish separately but these are in fact the same species.

Noise – Installation and operation

Do to the considerable number of unknowns in this field, we welcome the developers commitment to continually assess the noise produced by the project during construction and operation to help validate the noise model presented.

Increase of available habitat – Operation and maintenance

The developer has drawn analogies with wind turbines but these will not be producing the same degree of noise that would be associated with tidal turbines so the positive aggregation affect assessed here may not occur.

The developer has not assessed whether the increased aggregation around the tidal turbines may have an increase in the number of collisions with the turbines.

Potential variances in environmental impacts

The developer has not presented what the assessed impacts of these potential changes would be, therefore it is difficult to see whether these changes would be deemed as acceptable.

Proposed monitoring

We recognise the developers commitment to develop a meaningful fish monitoring programme which would help validate some of the data gaps highlighted. We also recognise the willingness of the developer to work collaboratively with regulators, stakeholder and the wider industry to try and improve the understanding of how these devices interact with the environment in a real world situation.

In addition it may useful to consider EMF measurements as there is the potential for sections of the cable to be placed in natural seabed formations. As this would imply that the cable will not be fully buried it would be useful to see what level of EMF/iE/E fields are detectable above the cable.

Atlantic Salmon Encounter Rate Report (Xodus 2011)

2.4.3 and 2.4.4

The swept area of turbine should also account for the additional rows of turbines behind the first 2 rows as the probability of encountering a turbine will increase with the numbers of rows of turbines that fish must swim through.

Diadromous species

The Environmental Statement and HRA have appropriately identified the main sources of risk and attempted to identify the baseline situation from available literature and other sources. Particular emphasis is correctly placed on the potential impacts of EMF, noise and strike. These are discussed below.

This response attempts to identify some of the uncertainties associated with the MEYGEN E.S. in order that MS-LOT can make an informed decision on development where risks and unknowns are clearly understood.

Baseline

The baseline information is largely correct and draws heavily on a previous review conducted by MSS (Malcolm *et al.*, 2010). There are however, a few areas where the description is inaccurate or does not make best use of available information. Specifically, the estimates of repeat spawners are not directly applicable to Scottish rivers (13.39), it is uncertain from available data whether smolts from either east or west coast rivers pass through the Pentland Firth (13.43) and the E.S. should not assume that smolts always swim at shallow depths given the likely non-transferability of data from other locations as cautioned by Malcolm *et al.*, (2010).

The description of sea trout suggests that they have a similar life strategy to salmon. However, it should be noted that brown trout exhibit much more highly variable life strategies to salmon including prevalence of repeat spawners, use of coastal habitat for extended periods for feeding and frequent fresh water to marine movements. As such the life histories of the two species can be markedly different. These differences in ecology could affect susceptibility to renewable developments as salmon are likely to be in the locality of developments only during migration, whereas some populations of sea trout may be in the vicinity of the same developments over prolonged periods when feeding at sea.

In the case of European eel, it is suggested in paragraph one (13.52) that the life cycle is well known. Unfortunately there remains considerable uncertainty over the migration of eels at adult and juvenile life stages and the precise location of spawning. The ES states that there is little information to indicate eels pass through the inner sound. However, there is also no information to say that they don't and indeed the likelihood is that at least glass eels move through the Pentland area given their small size and therefore large dependency on tidal currents.

Noise

It is useful that the ES notes the un-validated nature of the thresholds used to assess the likely impacts of noise (13.157). The E.S. also identifies that the Pentland Firth is a noisy environment where anthropogenic activities are likely to be masked by background noise. Given limited information on the noise sensitivity of salmon, sea trout and eels (Gill *et al.*, 2012) the ES groups these species into the hearing generalist category and concludes that a behavioural response would only occur within 1m of the tidal array and that as such it is unlikely to pose a particular problem for the species in question. This conclusion should be placed in the context of the uncertainty in noise levels associated with the development, the hearing abilities of the fish concerned and uncertainty of thresholds for behavioural response, although the general approach that has been taken seems reasonable given the absence of better data.

EMF

The E.S. provides a reasonable summary of EMF and current understanding of the effects of EMF on fish. Unfortunately the E.S. seems uncertain as to the strength of likely EMF associated with the project, but suggests it would be less than Earth's magnetic field (quoted as 30-70 T). The E.S. also identifies that EMF will not be produced during periods of slack water, that much of the cable routing will be within boreholes created by directional drilling and that cables will be bundled together to minimise EMF. Although considerable uncertainty remains over the potential impacts of EMF on diadromous fish (Gill *et al.*, 2012), the mitigation proposed here is to be welcomed and forthcoming research by MSS on A.C. EMF responses should better inform the risk associated with EMF in due course.

Strike

Probably the greatest risk associated with this project is the risk of strike. In recognition of this issue, the E.S. has attempted to carry out some strike risk modelling with the stated intent of assessing potential impacts on salmon populations. While it is readily possible to estimate the physical parameters in the model, current scientific knowledge does not permit reasonable biological parameterisation. As such the outputs, which are not based on the full range of potential parameter values (for example repeat transits of the site or all fish passing through the turbines), are very variable, highly uncertain and have little real value for decision making.

In particular the model requires the following biological data:

- Swimming depths – although the E.S. and HRA documents emphasise that smolts and adult salmon are likely to swim at shallow depths, the recent review by Malcolm *et al.*, (2010) cautioned that transfer of data from other locations was not appropriate and that further data on swimming depths in Scottish coastal water was required. This is of critical importance because it would make the difference between zero and potentially much higher impact. It should be noted that attempts by MSS (funded by Crown estates and MS) to obtain data on adult swimming depths from satellite tagging were delayed in 2012. However, it is hoped that the first such data can be obtained in 2013, at which point such strike models could be considerably better informed.
- Migratory habitat use within the Pentland Firth – Unfortunately there is no information on how fish migrate through the Pentland Firth. It could be that fish make use of the areas of strong currents or avoid them. This would greatly affect strike risk. At present the developers assume uniform distribution in the water column. However, there is no basis for assessing the validity of this assumption.
- Avoidance rates – There is currently no data on rates of avoidance associated with the type of tidal turbines or high velocity environments involved with this project. As such the decision to use values of 50-99.5% (e.g. Table 13.15) are somewhat arbitrary, producing widely varying model outputs, none of which have any more factual basis than another.
- Number of encounters – At present the E.S. seems to assume that fish will only transit the site once. However, it is unclear that this is the case; depending on fish behaviour and swimming speeds and tidal currents, fish could transit the site more than once and indeed many times. As noted earlier, sea trout may forage for extensive periods in coastal zones and hence may transit past turbines on numerous occasions.
- Consequences of strike – In cases where strike does occur it is uncertain what the consequences are for fish survival. Indeed, disorientation from near misses may also have consequences for survival if the fish are thereby rendered more vulnerable to predation than would otherwise have been the case.
- It is uncertain what proportion of Scottish salmon pass through the Pentland Firth – The E.S. includes a pers. Comm. from Jason Godfrey where it is suggested that 90% of salmon could pass through the Pentland Firth. It should be noted that this pers. Comm. seems to have been taken out of context and in fact there is no scientific information on the numbers passing through the Pentland as identified by Malcolm *et al.*, (2010) as such this choice of value is also somewhat arbitrary.

- The model assumes that smolts from the west coast do not pass through the Pentland Firth, but those from the east do. There is currently no scientific evidence about the proportion of smolts from either coast passing through the Pentland Firth.
- Swimming speeds are required in order to assess strike risk and it is assumed that fish travel passively with the tide. This may not be the case where fish are attempting to travel in the opposite direction from the tidal current.

The E. S. states that it explores a worst case scenario. However, this does not appear to be entirely correct. For example, a worst case could involve all fish passing through the Pentland Firth multiple times, travelling at speeds slower than the tidal current and travelling directly through the sweep of the turbine arrays. Although this is unrealistic, it is not markedly less realistic than any other scenario given available data. One further area of concern over the strike model is that it only appears to consider the first two rows of turbines, when in fact it appears that fish could risk encountering multiple rows of turbines, thereby an individual could presumably face a multiple strike risk passing through the array.

Having calculated highly variable risks of encounter the E.S. then goes on to attempt to assess the actual numbers of fish (salmon only are assessed) that could be affected by the proposal. In the case of smolts this is done by attempting to scale the estimated number of smolts leaving the River North Esk up to the Scotland scale using estimates of wetted area. This is known to be fraught with scientific and technical problems and as such the numbers obtained should be viewed with extreme caution. For adult fish, estimates of 1SW (1 sea winter) and MSW (multi-sea winter) fish were obtained from ICES reports.

Having produced a risk of strike and estimate of fish numbers the E.S. then goes on to try and assess the impact on salmon populations. It does this by estimating the total number of fish that could be affected which varies substantially depending on the assumptions made in the modelling, which as identified previously may be incorrect.

Putting potential impacts in context

The E.S. repeatedly refers to effects at the population level, but does not appear to know what this means in the context of fish and fisheries. Populations generally refer to distinct breeding groups. It may be that the E.S. is intended to refer to stocks (which would be groups of fish with similar intrinsic characteristics e.g. sea age, growth rates etc) or simply to numbers of fish from geographic areas (East Scotland), regions or rivers.

Regardless of this particular issue, the E.S. cannot fulfil the stated aim of assessing impacts on salmon populations (or stocks or rivers) without also considering the status of the affected salmon stocks / rivers / regions. This is because the level of losses that could be tolerated depends on the initial health of the stock in question, so for example smaller losses can be tolerated when population levels are suppressed compared with when they are healthy. Assessment of the status of affected salmon is currently missing from the E.S. but represents both a scientific and management challenge. Information sources on the health of salmon stocks could include, rod catch, counter data, stock-recruitment relationships (for data rich location) or site condition monitoring data (for Habitats Directive) among other sources.

Strike, sea trout and eels

Sea trout and eels are only considered in passing in the E.S. and it is stated that effects are likely to be less than for salmon. It is not clear that this is true. In the case of sea trout the effects are more likely to impact on local than distant rivers, but sea trout could be impacted by repeat encounters due to local habitat use. In the case of adult eels, these are generally considered to use greater depths and as such may have a relatively high risk of encounter. In the case of eels and sea trout there is no consideration of local population health (sea trout) or European stock health (eels) in which context to consider overall risk.

Cumulative Impact

Given the highly uncertain assessment of strike risk for this proposal, it is surprising to see the potential for cumulative effects so readily dismissed. It is important that these comments are recognised as also being similarly uncertain as a series of turbine projects clearly pose progressively greater risk for fish migrating through a particular area and cumulative impacts are a distinct risk.

Monitoring

MEYGEN acknowledge the very considerable uncertainty associated with their assessment of strike risk and suggest that monitoring of local scale impacts may be possible as part of the development. This would seem extremely sensible and opportunities for deploying DIDSON cameras or other similar technologies would be worthy of consideration in order to assess avoidance / strike. Furthermore, the developers note that effects of this and other renewables proposals may be expressed on a number of rivers. As such LOT may wish to consider whether a network of counters should be supported on a number of Scottish rivers for assessing population status and change. This would obviously have to be a wider scale initiative than MEYGEN involving multiple developers or other funding sources.

Finally MEYGEN identify that they could also collect data on underwater noise of candidate turbines to validate current noise models. It is suggested such opportunities should be pursued to inform future development.

Summary

The MEYGEN tidal turbine proposal is proposed for the inner sound of the Pentland Firth an area that is thought to be extensively used by juvenile and adult salmon, sea trout and eels. In the case of eels, these could be heading to / coming from a range of European countries as well as Scotland. In the case of salmon, the proposal could potentially affect all major Scottish salmon rivers. In the case of sea trout the proposal would be more likely to affect nearby than distant rivers based on current knowledge of sea trout behaviour.

The main risks were identified by the developer and considered in the E.S. and HRA document (in the case of the salmon SACs). The E.S. suggests that none of the potential impacts are likely to have a significant effect on diadromous species. However, particularly in the case of strike, the uncertainties involved are very substantial and as such the findings have to be considered with great caution. The risks associated with this proposal will be greatly informed by the programme of work underway at MSS-FL which in the coming 12-18 months should provide information on adult salmon swimming depths and behaviour in relation to EMF.

The suggestion by the developer to carry out monitoring as part of the project and to contribute to a wider package of monitoring as part of an industry wide response to risks should be given serious consideration.

Chapter 14. Commercial fisheries

Although the developer has stated that there are only 3 fishermen with a total of 4 vessels that regularly work the area. The assessment of the economic importance of this fishery for these local fishermen has not been presented.

MeyGen Limited
27 Lauriston Street
Edinburgh
EH3 9DQ

Our ref: EIA/MEYGEN/4.2.1.1701

Hazardous Installations
Directorate

Kirsten Laidlaw

Chemical Industries
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59 Belford Road
Edinburgh
EH4 3UE

Tel: 0131 247 2000
Fax: 0131 247 2041
kirsten.laidlaw@hse.gsi.gov.uk

<http://www.hse.gov.uk/>

HM Principal Inspector of Health &
Safety
Dr G. A. Cook

Date: 26 July 2012

Dear Sirs

**ENVIRONMENTAL ASSESSMENT FOR PROPOSED DEVELOPMENT OF PHASE 1, MEYGEN
TIDAL ENERGY PROJECT AT PENTLAND FIRTH AND ORKNEY WATERS.**

Thank you for your letter of 13 July 2012 enclosing a copy of the environmental statement for the proposed development by Meygen at Pentland Firth and Orkney Waters.

Environmental Impact Assessments are concerned with projects which are likely to have significant effects on the environment. HSE's principal concerns are the health and safety of people affected by work activities. HSE has no comments on this environmental statement.

Yours faithfully



Kirsten Laidlaw
Admin Support

Mr Andrew Sutherland
Marine Scotland
Marine Laboratory PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

Tel: +44 (0)23 8032 9191

E-mail: Graeme.proctor@mcga.gov.uk

Your ref: 009/TIDE/MGIS1-6

Our ref:

31st August 2012

Dear Andrew

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1998 AND A MARINE LICENCE UNDER PART 4, SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE A TIDAL ARRAY, INNER SOUND OF THE PENTLAND FIRTH

Many thanks for your letter of 27th July inviting comment on the Environmental Statement (ES) for the proposed MyGen Marine Licence application to construct and operate a tidal array in the Pentland Firth Inner Sound.

The MCAs remit for offshore renewable energy development is to ensure that safety of navigation is preserved, as progress is made towards government targets for renewable energy. The full ES is a necessarily large and wide ranging series of documents, this response is focused on the shipping and navigation elements of the ES, primarily the Navigation Risk Assessment (NRA).

This letter covers details against phase one of the development proposals, subsequent phases will be subject to a revised NRA submission. It is noted that the ES covers the development under the broad basis of the Rochdale Envelope approach, which naturally impacts on the response methodology, reflected in the conclusions drawn. Some concerns remain within the ES which will need to be addressed prior to any consent conditions being provided.

Navigable Depth

This development will see the available depth of water be reduced by some 75% down to the quoted 8m above LAT, potentially a significant impact on current and potential future traffic trends, UKHO to be consulted to address how this information is promulgated to the mariner, particularly in the early stages of development before information finds its way onto admiralty charts.

Safety Zones

The restricted sea room of the Inner Sound creates a significant impact on the provision of a 500m construction and maintenance safety zone, section 17.4 of the

NOT PROTECTIVELY MARKED

NRA addresses this with proposed mitigation measures, reducing the safety radius down to 100m and implementing for essential operations only. This approach is supported, free navigation through the sound needs to be maintained at all times.

Cable Routes

Export cable routes, will be subject (2.4) to extreme wave and tidal conditions with extreme hydrodynamic forces likely to be experienced, cable burial is not an option due to the seabed conditions. However due cognisance needs to be taken addressing cable protection, particular where this impacts shallow water.

Survey Data

MGN 371 Annex 2 Paragraph 6 iii requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. This information is yet to be submitted, Failure to report the survey or conduct it to Order 1a might invalidate the Navigational Risk Assessment if it was deemed not fit for purpose.

Emergency Response & Co-operation Plans

An approved ERCOP provides an essential element of the development planning, and will require to be agreed and in place prior to consent.

MGN 371

In order for MCA to complete a detailed assessment of the NRA, developers are required to submit an MGN 371 checklist, although an interim review has been completed the submission of the checklist remains an extant requirement of our approval for the development, which MCA will be content to review upon receipt.

Conclusion

It is noted that the NRA does not draw any formal conclusions from its assessment; it has been used as a tool to outline impacts on traffic, its purpose purely to highlight risks, and consider any mitigation that may be appropriate in ensuring shipping will not be adversely impacted from the safety of navigation perspective.

The comments detailed above are not considered to be blocks to development, but provided to highlight concerns which will need to be addressed prior to any consent conditions being provided. Subject to the developer meeting requirements addressed in this letter, it provides a cautious acceptance of the licence request.

Yours sincerely



Graeme Proctor
MCA
Navigation Safety

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INVESTORS
IN PEOPLE



Northern Lighthouse Board

CAPTAIN PHILLIP DAY
DIRECTOR OF MARINE OPERATIONS

Your Ref: 009/TIDE/MGIS1 - 6
Our Ref: SD/OPS/ML/O8_04_076

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Email: enquiries@nlb.org.uk



Mr Andrew Sutherland
Marine Renewables Licensing Officer
Marine Scotland – Marine Policy and Planning
Scottish Government
Marine Laboratory
PO Box 101
375 Victoria Road
Aberdeen
AB11 9DB

4 September 2012

Dear Andrew

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1998 AND A MARINE LICENCE UNDER PART 4, SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE A TIDAL ARRAY, INNER SOUND OF THE PENTLAND FIRTH

Thank you for your correspondence dated 27 July 2012 regarding the application submitted by **MeyGen Ltd** for a Marine Licence to construct and operate Phase One of a tidal array in the Inner Sound of the Pentland Firth. Subsequent phases will require separate consultation and permissions.

We note that the Navigation Risk Assessment produced by **Anatec Ltd** in April 2012 on behalf of **MeyGen Ltd** is in accordance with the requirement of MCA Marine Guidance Notice 371, and specifically with regard to reduced clearance depths between the device and Lowest Astronomical Tide (LAT) levels.

Northern Lighthouse Board has no requirement to mark the devices but require:-

- 1) All turbines to be installed at a depth to ensure at least 8 meters minimum clearance relative to LAT above the turbine blades as per section 2.2 of the NRA.
- 2) During the device(s) preparation, installation, operation/maintenance and decommissioning phases we would require that adequate notice is given to the mariner in consultation with HM Coastguard. We would recommend that all Notices to Mariners or Local Radio Navigation Warnings clearly state the nature and duration of these works, especially in the early stages of development before relevant information is published to the admiralty charts.
- 3) Whilst the device(s) are in their operation/maintenance phase, the condition of the device(s) should be actively monitored, and a contingency plan be in place to respond to any reported catastrophic failure events which could see the device(s) or parts of the device(s) breaking loose and coming to the surface as a buoyant hazard. This should include the prompt transmission of local Radio Navigation Warnings.

For the safety of

Certified to: ISO 9001:2000 · The International Safety Management Code (ISM) ·

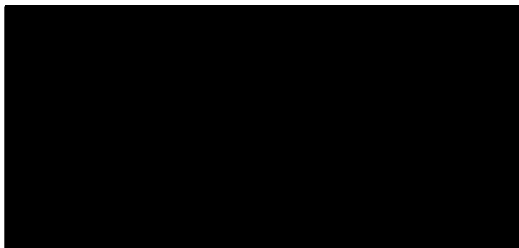


- 4) We would require that the Hydrographic Office be informed of the device(s) location and minimum depth of water in order that the Admiralty Chart 2581 is updated to give information of the installation.

Any requirements pertaining to the cables and landing site(s) will be recommended once the final location(s) have been identified and all relevant information passed to Northern Lighthouse Board.

The requirements given above is only relevant to the information provided by the developer to date. Alterations may be necessary as further and more detailed information from the developer becomes available.

Please advise if we can be of any further assistance, or you require clarification of any of the above.



Unknown

From: orkneyfisheries [REDACTED]
Sent: 03 September 2012 11:20
To: Sutherland AI (Andrew)
Cc: [REDACTED]@sff.co.uk
Subject: Re: 009/TIDE/MGIS1 - 6: One Week Before Reminder Request For ES Comments Meygen: 31 August 2012

Good morning,

Our response will be covered by that submitted by SFF.

Rgds

Fiona Matheson

From: Andrew.Sutherland@scotland.gsi.gov.uk
Sent: Friday, August 31, 2012 11:29 AM
To: orkneyfisheries@scotland.gsi.gov.uk [REDACTED]
Subject: 009/TIDE/MGIS1 - 6: One Week Before Reminder Request For ES Comments Meygen: 31 August 2012

Dear [REDACTED]

ELECTRICITY ACT 1989

The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000
The Electricity (Applications for Consent) Regulations 1990

MARINE (SCOTLAND) ACT 2010

The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)

APPLICATION FOR CONSENT UNDER SECTION 36 OF THE ELECTRICITY ACT 1989 AND A MARINE LICENCE UNDER PART 4, SECTION 20 OF THE MARINE (SCOTLAND) ACT 2010 TO CONSTRUCT AND OPERATE A TIDAL ARRAY, INNER SOUND OF THE PENTLAND FIRTH

Please find attached the consultation letter for the above application. I would be grateful for any comments you have by **7th September 2012**. If you are unable to meet this deadline, please contact us to arrange an extension to the consultation period. If you have no comments to make please submit a nil return response.

Best regards,

Andrew

Andrew Sutherland

Marine Renewables Licensing Advisor
 Marine Scotland Marine Planning & Policy Division
 Scottish Government | Marine Laboratory, PO Box 101 | 375 Victoria Road | Aberdeen AB11 9DB
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<http://www.scotland.gov.uk/topics/marine/licensing/marine>
<http://www.scotland.gov.uk/topics/marine/science/msinteractive>

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Dh fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chl radh neo air a sgr dadh airson dearbhadh gu bheil an siostam ag obair gu h-ifeachdach neo airson adhbhar laghail eile. Dh fhaodadh nach eil beachdan anns a phost-d seo co-ionann ri beachdan Riaghaltas na h-Alba.

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has been swept for the presence of computer viruses.

Unknown

From: Gethin, Toby [Toby.Gethin@thecrownestate.co.uk]
Sent: 03 September 2012 13:50
To: Sutherland AI (Andrew)
Subject: RE: 009/TIDE/MGIS1 - 6: One Week Before Reminder Request For ES Comments Meygen: 31 August 2012

Dear Andrew

Thank you for consulting the Crown Estate on this. We have no comments to make.

Regards,

Toby

Toby Gethin (MRTPI)
 Consents adviser (wave & tidal)



The Crown Estate
 16 New Burlington Place
 London W1S 2HX
 Tel: 020 7851 5216
 Fax: 020 7851 5125
 Mob: [REDACTED]

Email: Toby.Gethin@thecrownestate.co.uk
www.thecrownestate.co.uk

Please think - do you need to print this email?

From: Andrew.Sutherland@scotland.gsi.gov.uk [mailto:Andrew.Sutherland@scotland.gsi.gov.uk]
Sent: Friday, August 31, 2012 11:10 AM
To: Gethin, Toby
Subject: 009/TIDE/MGIS1 - 6: One Week Before Reminder Request For ES Comments Meygen: 31 August 2012

Dear Mr. Gethin,

ELECTRICITY ACT 1989

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Please find attached the consultation letter for the above application. I would be grateful for any comments

19/10/2012

you have by **7th September 2012**. If you are unable to meet this deadline, please contact us to arrange an extension to the consultation period. If you have no comments to make please submit a "nil return" response.

Best regards,

Andrew

Andrew Sutherland

Marine Renewables Licensing Advisor

Marine Scotland – Marine Planning & Policy Division

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Dh'fhaodadh gum bi teachdaireachd sam bith bho Riaghaltas na h-Alba air a chlàradh neo air a sgrùdadh airson dearbhadh gu bheil an siostam ag obair gu h-èifeachdach neo airson adhbhar laghail eile. Dh'fhaodadh nach eil beachdan anns a' phost-d seo co-ionann ri beachdan Riaghaltas na h-Alba.

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Unknown

From: Ferguson V (Val)
Sent: 31 July 2012 10:32
To: MS Marine Licensing
Subject: 009/tide/mgis1-6 - MeyGen Inner sound Tidal array
Follow Up Flag: Follow up
Flag Status: Blue

Andrew,

Thanks for sight of this application – I have no comments to make and assume you will have included Pentland Ferries in your consultation.

Val Ferguson

Ports and Harbours Branch

Area 2G North

Victoria Quay

Edinburgh

EH6 6QQ

0131 244 7878

val.ferguson@transportscotland.gsi.gov.uk

Our ref: PCS/121552
Your ref: 009/TIDE/MGIS1-6

Andrew Sutherland
Marine Scotland

If telephoning ask for:
Cerian Baldwin

By email only to: ms.marinelicensing@scotland.gsi.gov.uk

7 August 2012

Dear Mr Sutherland

The Electricity Act 1989

Town and Country Planning (Scotland) Acts

Section 36 consent and Marine licence On shore infrastructure to support 86 MW tidal energy project (MeyGen Project - Inner Sound of the Pentland Firth) - Canisbay, Caithness

Thank you for your consultation letter of 27 July 2012 which SEPA received on 30 July 2012. We note that this application is solely for the marine elements of the proposals.

As the Environmental Statement usefully covers both the marine and terrestrial elements we have taken this opportunity to provide our advice on both elements as there are number of issues where further information will need to be submitted in support of planning application when that is submitted. The planning authority and the applicant are copied into this response.

For the Section 36 application, we ask that the **condition** in Section 1 be attached to the consent. If this will not be applied, then please consider this representation as an **objection**. Please also note the advice provided below.

Advice for the Section 36 and Marine Licence application

1. Environmental management

- 1.1 We welcome the general mitigation principles and pollution prevention measures set out in Environmental Statement. As the works will not be regulated by us they need to be covered by condition. Therefore, we request that a **condition** is attached to the consent requiring the submission of a site specific environmental management plan (EMP). If this is not attached, then please consider this representation as an **objection**. To assist, the following wording is suggested.
- 1.2 At least two (2) months prior to the commencement of any works, a site specific environmental management plan (EMP) must be submitted for the written approval of the planning authority [in consultation with SEPA] [and other agencies such as SNH as appropriate] and all work shall be carried out in accordance with the approved plan.
Reason: to control pollution of air, land and water.
- 1.3 Details of what should be included in the EMP can be found on our [website](#). The EMP should also include details relating to prevention of the spread of non-native species. We appreciate that large ships and vessels will be following protocols for preventing the spread of marine non-native species, but would recommend that a specific protocol be drafted for



Chairman
David Sigsworth

Chief Executive
James Curran

Dingwall Office
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Dingwall Business Park, Dingwall, IV15 9XB
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www.sepa.org.uk

this project. This specific protocol should include measures to minimise the risk of bringing marine non-native species into the area on construction equipment before the works begin and should include measures that will be adopted to minimise the risks of introducing marine non-native species from marine plant and specialised equipment transported to the area during constructional phase, any maintenance works commence during the operational phase of the project.

1.4 Guidance that maybe drawn on to inform the development of the protocol is listed below:-

- Alien invasive species and the oil and gas industry: (<http://www.ogp.org.uk/pubs/436.pdf>)
- Marine Non-Native Species guidance from The Green Blue (recreation advice, but useful for small boats & equipment):
http://www.thegreenblue.org.uk/clubs_and_training_centres/antifoul_and_invasive_species/best_practice_invasive_species.aspx;
- SNH advice: <http://www.snh.gov.uk/land-and-sea/managing-coasts-and-sea/marine-nonnatives/>.

Pre-application advice for the planning application

2. Site layout

2.1 We note that the final location for the power conversion centre (PCC) and cable routes have yet to be determined. It is important that the below information requirements are considered when determining the final site layout and that all the required information is submitted with the planning application otherwise we **may have to object** due to a lack of information.

3. Private water supplies

3.1 We previously commented on the draft hydrogeology information by way of our letter PCS/115648. We note that Section 17.25 of the submitted Environmental Statement now states that the Highland Council private water supply records are incomplete. In addition it is not clear from Section 17.4.3 whether the water feature survey assessed the presence of any private water supplies within the study area.

3.2 We note from Ordnance Survey 1:10 000 maps that there may be 3 wells within 100m from one of the possible cable routes (at ND 36204 73664, ND 35292 72754, ND 33490 72008). It is possible that properties within the area rely on these wells as private water supplies (PWS). Alternatively properties within the area may be connected to public water supply.

3.3 If any water supply source is within 100m from proposed tracks and trenches or 250m from proposed foundations then the following information should be submitted with the forthcoming planning application:

- Source location (including National Grid co-ordinates)
- Source type
- Abstraction rate
- Number of people served
- A quantitative hydrogeological assessment which demonstrates that risk to the groundwater abstraction is not significant.

- 3.4 Cable trenches are likely to form permanent preferential flow paths for groundwater. It is possible that this may divert groundwater flow from wells that are located at close proximity to the trenches. In order to protect groundwater sources either the cable trenching should avoid entering within the 100m buffer area around all wells or further information and investigations will be required if operations are proposed closer to receptors. In the latter case a quantitative hydrogeological assessment is required to demonstrate that risk to groundwater abstractions are not significant.
- 3.5 For further information on what we would expect in a quantitative hydrogeological assessment please refer to Appendix 2 Section 5 of the [Land Use Planning System SEPA Guidance Note 4 \(LUPS-GU4\)](#) which is also applicable to this type of development.

4. Flood risk

- 4.1 The locations of the power conversion centres (PCC) are close to the coast. The 1 in 200 year coastal flood level, according to the Coastal Flood Boundary Conditions for UK Mainland & Islands (Environment Agency Project: SC060064/TR4: Practical guidance design sea levels), is 2.4 mAOD. Section 17.114 the Environmental Statement states that the onshore infrastructure is planned to be located no less than 5 mAOD and will be set back from the immediate coastline.
- 4.2 Few small watercourses are identified within the proposed sites for the PCCs. The proposed general approach for mitigating or dealing with flood risk is presented in the Environmental Statement in Table 17.7 on page 17-21. We are satisfied that any flood risk from the small watercourses can be managed through site drainage design.
- 4.3 When finalising the site layout the site plans will need to demonstrate that the proposed PCC is located above 2.4 mAOD and that a detailed site drainage strategy is submitted which demonstrates that all buildings and onshore electricity related infrastructure will be located above the 1 in 200 year fluvial flood level. We would also recommend an additional allowance of 500 to 600 mm for freeboard which should be agreed with the flood prevention unit of the planning authority.
- 4.4 The potential routes for the proposed underground cable routes cross several small watercourses. It is understood that the crossings will be constructed under ground. Further, any spoil arising as a result of works are proposed to be disposed off outwith the functional floodplain. Therefore, we do not envisage impact on the functional floodplain or adverse impacts on the proposed infrastructure due to flood risk. However if any crossings, including temporary crossings, are proposed over ground, full details of the location and design of the crossings should be submitted with the planning application including any relevant photographs and drawings.
- 4.5 For information for the applicant, in Section 17.111, it appears that the Environmental Statement relies fully on the Indicative River & Coastal Flood Map (Scotland) for assessment of fluvial flood risk when it states that flood risk is present only for certain sections of the named burns. In this regard, we would like to state that although every watercourse has a functional floodplain associated with it, the Indicative River & Coastal Flood Map (Scotland) shows flood risk only when the catchment size is equal or greater than 3 sq km. Further, the flood envelope shown is indicative only and should not be relied on for site specific assessments.

- 4.6 For information, the Indicative River & Coastal Flood Map (Scotland) has been produced following a consistent, nationally-applied methodology for catchment areas equal to or greater than 3km² using a Digital Terrain Model (DTM) to define river cross-sections and low-lying coastal land. The outlines do not account for flooding arising from sources such as surface water runoff, surcharged culverts or drainage systems. The methodology was not designed to quantify the impacts of factors such as flood alleviation measures, buildings and transport infrastructure on flood conveyance & storage. The Indicative River & Coastal Flood Map (Scotland) is designed to be used as a national strategic assessment of flood risk to support planning policy in Scotland. For further information please visit www.sepa.org.uk/flooding/flood_map.aspx.
- 4.7 Please note that we are reliant on the accuracy and completeness of any information supplied by the applicant in undertaking our review, and can take no responsibility for incorrect data or interpretation made by the authors.
- 4.8 The advice contained in this letter is supplied to you by SEPA in terms of Section 72 (1) of the Flood Risk Management (Scotland) Act 2009 on the basis of information held by SEPA as at the date hereof. It is intended as advice solely to The Highland Council as Planning Authority in terms of the said Section 72 (1). Our briefing note entitled: "*Flood Risk Management (Scotland) Act 2009: Flood risk advice to planning authorities*" outlines the transitional changes to the basis of our advice inline with the phases of this legislation and can be downloaded from www.sepa.org.uk/flooding/flood_risk/planning_flooding.aspx.

5. Wetlands

- 5.1 In our response PCS/115648 dated 12 September 2011, we advised that further information on wetlands may be required however we note this that this information is not included within the Environmental Statement. If the possible cable route crossed the area identified as an area of 'wet modified bog, habitat type E1.7' in Section 17.66 of the Environmental Statement then further information relating to Groundwater Dependant Terrestrial Ecosystems (GWDTEs) would be required.
- 5.2 The development this cable route is likely to form a preferential flow path for groundwater and therefore is likely to divert groundwater from the surrounding area, causing increased drainage from the bog area. It is noted that if this option is chosen the cables will be located as close to the existing road as possible in order to minimise disruption to this GWDTE.
- 5.3 When the planning application is submitted, and if the cable route goes through the GWDTE, then a quantitative hydrogeological assessment in accordance with Appendix 2 Section 5 of the [Land Use Planning System SEPA Guidance Note 4 \(LUPS-GU4\)](#) should be submitted with the planning application along with details of any proposed mitigation to stop the cable becoming a preferential flow path for groundwater.

6. Watercourse crossings

- 6.1 We note that the proposed cable watercourse crossings will be constructed underground. It is our understanding that boring and isolated open-cut with temporary bridges for construction traffic will be used. These are likely to be consentable under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR).

7. Environmental management

- 7.1 We welcome the general mitigation principles and pollution prevention measures set out in Environmental Statement. Some of proposed measures relate to works which may be regulated by us. However, many of the works will not be regulated by us and need to be covered by condition. Therefore, we are likely to request that a **condition** is attached to the planning consent requiring the submission of a site specific environmental management plan (EMP). To assist, the following wording is suggested.
- 7.2 At least two (2) months prior to the commencement of any works, a site specific environmental management plan (EMP) must be submitted for the written approval of the planning authority [in consultation with SEPA] [and other agencies such as SNH as appropriate] and all work shall be carried out in accordance with the approved plan.
Reason: to control pollution of air, land and water.
- 7.3 Details of what should be included in the EMP can be found on our [website](#). Dependant on the outcome of the assessment detailed in Sections 3, 4 and 5 the EMP should also include details of mitigation for private water supplies, GWDTEs and site drainage.

Regulatory advice for the applicant

8. Regulatory requirements

- 8.1 Any proposed watercourse crossings or cabling under watercourse will need to be carried out in accordance with The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR).
- 8.2 Useful guidance on the best crossing types can be found in the [CAR Practical Guide](#). SEPA Guidance notes [WAT-PS-06-02](#) and [WAT-SG-25](#) also provide useful further guidance. The method of crossing and size of watercourse will determine regulation required as detailed within the CAR Practical Guide. For example General Binding Rule 7 would have to be adhered to if boring under the watercourse. If you proposed an open cut on the bed of the watercourse shown on the 1:50,000 Ordnance Survey map this would require a registration.
- 8.3 Details of regulatory requirements and good practice advice for the applicant can be found on our website at www.sepa.org.uk/planning.aspx. If you are unable to find the advice you need for a specific regulatory matter, please contact a member of the operations team in your local SEPA office at Strathbeg House, Clarence Street, Thurso KW14 7JS. Telephone 01847 894 422.

If you have any queries relating to this letter, please contact me by telephone on [REDACTED] or e-mail at planning.dingwall@sepa.org.uk.

Yours sincerely

Cerian Baldwin
Senior Planning Officer
Planning Service

Copy to: [REDACTED] [@highland.gov.uk](mailto:[REDACTED]@highland.gov.uk); [REDACTED] [@meygen.com](mailto:[REDACTED]@meygen.com);

Disclaimer

This advice is given without prejudice to any decision made on elements of the proposal regulated by us, as such a decision may take into account factors not considered at the planning stage. We prefer all the technical information required for any SEPA consents to be submitted at the same time as the planning application. However, we consider it to be at the applicant's commercial risk if any significant changes required during the regulatory stage necessitate a further planning application and/or neighbour notification or advertising. We have relied on the accuracy and completeness of the information supplied to us in providing the above advice and can take no responsibility for incorrect data or interpretation, or omissions, in such information. If we have not referred to a particular issue in our response, it should not be assumed that there is no impact associated with that issue. If you did not specifically request advice on flood risk, then advice will not have been provided on this issue. Further information on our consultation arrangements generally can be found in [How and when to consult SEPA](#), and on flood risk specifically in the [SEPA-Planning Authority Protocol](#).

Surfers Against Sewage comments on the Environmental Statement for the MeyGen Tidal Energy Project, Phase 1

Surfers Against Sewage (SAS) would like to make the following comments on the Environmental Statement for the MeyGen Tidal Energy Project, Phase 1.

As mentioned in the Environmental Statement, surfing is a popular activity in the Gill's Bay area. Gill's Bay itself has a very high quality and very valuable wave. Caithness has a well-established surfing community and plays host to some of the UK's best surfing waves, as well as being home to a world-class wave at Thurso, which is highly popular and extremely valuable to surfers not just in the UK, but worldwide.

Whilst modelling suggests negligible change to wave climates as a result of the project, there is a concern that the cabling could have an effect on surfing through bathymetrical change and restricted access for surfers during drilling work. Section 9.106 (p90 of Environmental Statement), states that "there is the potential for the installed cables to alter any seabed bedforms on the site via alteration of near bed hydrodynamic and sedimentary processes". This potential alteration could have an effect on the way waves in the bay break and could pose a danger to surfers. Changes in sediment deposition can affect how the wave breaks, potentially stopping it from "peeling" (breaking one section at a time, allowing the surfer to ride along the unbroken face of the wave, trying to keep in the most powerful section of the wave next to the white water) and making it "close out" (where a number of sections break at once, meaning the surfer cannot travel continuously along the face of the wave). Waves that "close out" also pose more danger to surfers paddling out as it is difficult to predict where the wave will break, meaning that they are more likely to get caught in the "impact zone" (where the waves are breaking) and potentially get injured by other surfers riding the wave as they cannot predict where they will go as they can with peeling waves, risking a collision. We request that modelling is undertaken to assess the impacts of changes to bathymetry along the cable route on surfing waves in Gill's Bay.

As well as SAS and Scottish Surfing Federation, we recommend that Surfing GB are included in future stakeholder consultations.





Surfers Against Sewage
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It is strongly recommended that the SAS reports "Guidance on Environmental Impact Assessment of Offshore Renewable Energy Development on Surfing Resources and Recreation" (2009) and "The WAR Report" (2010) – both available online at <http://www.sas.org.uk/campaigns/education/sas-reports-and-research-papers/>, are used in order to ensure impacts on recreational water users are adequately addressed, and appropriate consideration is given to the watersports community in all stages of the project.

If you have any questions please do not hesitate to get in touch. SAS would like to request that we are informed of all updates to MeyGen plans and consultations.



Our Ref SCT6532B
Your Ref 009/TIDE/MGIS1 - 6

10 September 2012

Andrew Sutherland
Marine Scotland
Marine Laboratory
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Dear Andrew

**THE ELECTRICITY ACT 1989
THE ELECTRICITY WORKS (EIA) (SCOTLAND) REGULATION 2000
MARINE (SCOTLAND) ACT 2010
THE MARINE WORKS (EIA) REGULATION 2007
PROPOSED INNER SOUND TIDAL ENERGY PROJECT, CAITHNESS (ENVIRONMENTAL
STATEMENT)**

With reference to your recent correspondence dated 30 July 2012 on the above development, we write to inform you of our involvement as Term Consultants to Transport Scotland – Trunk Road Network Management Directorate (TS-TRNMD) in relation to the provision of advice on issues affecting the trunk road network.

We have been passed a copy of the Environmental Statement (ES) prepared by MeyGen Limited in support of the above development. Having reviewed the information provided, we would make the following comments.

We understand from the information provided that the proposed development involves the construction of up to 398 1MW tidal turbines to be located in the Inner Sound of the Pentland Firth off the northern coast of Scotland between Caithness on the Scottish mainland and the island of Stroma. We understand the project will be undertaken in Phases. Phase 1 will have a maximum aggregated capacity of 86MW, with up to 86 tidal turbines and associated infrastructure comprising an initial Phase 1a deployment of 20 turbines (20MW), followed by a subsequent Phase 1b which will deploy a further 65 turbines (65MW). Phase 2, will comprise the build out of the remainder of the project and will be subject to a separate consent application.

We note that each turbine will have its own dedicated electricity export cable to shore. Cable landfalls will take the form of Horizontally Directionally Drilled (HDD) bores which will be drilled from onshore and we understand that electricity will be exported to the local grid via buried onshore cables to a grid connection point. We note that on-shore infrastructure will be located on the mainland at Ness of Quoy which is located approximately 1km from Canisbay village and Ness of Huna located on the mainland coast next to the hamlet of Huna, roughly 1.5km west of John o' Groats. We note that the closest trunk roads are the A9(T) and A99(T) trunk roads which provide strategic access to the area.

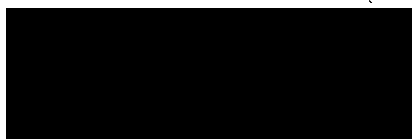
We understand from the information provided that whilst all the offshore works including turbine support structure installation and marine installation operations will be undertaken by specialist vessels at sea, we note that the delivery of turbine components and other large and heavy components could be shipped to the nearest port and then transported to a local assembly point from where the equipment would be taken out again by sea. We note that the final port to handle the delivery of components has not been determined yet however it is likely that Scrabster, following the harbour's planned extension as well as those at Wick and Lyness have been considered.

We would comment that with regard to Scrabster Harbour, traffic on exiting the harbour would travel via the A836 in a north-easterly direction towards the development area and potential assembly point onshore. Similarly, traffic exiting Wick Harbour would travel via the A99 in a north-westerly direction towards the development area. We would comment that the proposed route for the delivery of turbine components from either port is part of the local road network and in these circumstances, Transport Scotland have no comments to make.

We note also that additional onshore infrastructure is required to transfer the electricity generated from the tidal turbines to the National Grid. We understand that consent for those aspects of the project will be applied for under a separate application for planning permission under the Town and Country Planning (Scotland) Act 1997 and Transport Scotland will be in a position to provide comments on this aspect when consulted on the application.

I trust that the above is satisfactory and provides suitable guidance for the preparation of the assessment. In the meantime, please do not hesitate to contact me at our Glasgow Office if you have any queries.

Yours faithfully




Associate Director

Tel 0141 226 6923

Email @jmp.co.uk

 Transport Scotland Development Management