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Contents

Introduction

Mark Shorrock, CEO of Tidal Lagoon Power Ltd and Tidal Lagoon (Swansea Bay) Plc, has written this foreword in order to present the wider purpose and vision of Tidal Lagoon Power Ltd, as it relates to the Project and tidal lagoons as a technology. Given the absence of Government policy specifically related to tidal lagoon technology, this serves to identify the multiple benefits of tidal lagoon projects, and this Project in particular.

Foreword

Some 20,000MW of UK electricity generating capacity is approaching end-of-life shutdown, against a winter peak demand of around 60,000MW. By harnessing the rise and fall of the tides, the UK has a once in a lifetime opportunity to make a true transition to zero carbon, 120-year-life, energy sources, that also provide benefits to the planet and to the communities who host them. This is predictable, long term, low cost energy generated four times a day, every day.

Our aim for Swansea Bay Tidal Lagoon is to create a project that can mean something positive to every person who lives around Swansea Bay and beyond, that provides an asset for the nation and a myriad of wider benefits. It supports the replenishing of the seas in terms of lobsters, oysters, mussels, bi-valves, sea grasses and other species; creates education opportunities, fun sporting events, a great sports training area, and recreational or competitive fishing; and provides long term jobs, skills training and ultimately an export industry, as more and more tidal lagoons come on line across the country and around the world.

The UK must spend £110 billion this decade if we are to start fixing our energy generation shortfall. The utility companies alone are not able to support this level of capital expenditure, so we will increasingly see private initiatives such as TLSB bringing forward new infrastructure, funded by pension and insurance investment. Our aim is for this money to be spent on lagoons around the UK to directly revitalise industries, regional economies, the environment and, in the case of the Swansea Bay Tidal Lagoon, the Swansea Bay region.

The Swansea Bay Tidal Lagoon will:

- Provide enough home-grown, low carbon electricity to power the equivalent of 90% of Swansea Bay homes for 120 years;
- Produce power that is cheaper than most, if not all, other sources of UK supply for the 85 years that follow its investment period;
- Create 90 to 100 jobs in a new hydro turbine assembly plant in Swansea;

- Create 35 to 40 jobs in a new quarrying operation;
- Create or maintain supply chain jobs in: shaft forging and machining; plus the manufacture of runner blades, bearings, stators, copper windings, stay columns, draft tube liners, switchboards and many other areas of the mechanical and electrical supply chain;
- Create or maintain supply chain jobs in building the offshore structures (the construction workforce is expected to provide 1,850 new jobs);
- Create construction jobs in design for manufacture and assembly yards (expected to be 102 jobs);
- Give rise to a 28-person Operations and Maintenance workforce;
- Create a long term environmental monitoring and mitigation and feedback loop operation, employing five full-time people;
- Create a 40-person visitor centre and mariculture workforce;
- Nurture innovative mariculture and conservation industries, seeking to restore the native oyster to the 1870 harvests of 10,000+ tonnes per annum;
- Establish a 9.5km breakwater wall which, on its two faces, will provide 19km of artificial reefs, perfect for fish hatchery and fish and sea creature dwelling;
- Provide a public amenity to stimulate healthy living and cultural engagement that we think will attract visitors from around the world to witness and enjoy the world's biggest tidal power project;
- Support education at all levels and renew interest in the STEM disciplines;
- Build a visitor centre and boating centre that are zero carbon blueprints for public buildings, based on technology that won the Austrian House of the Future award for lowest energy-use buildings in Europe;
- Create the opportunity to be an owner of our energy infrastructure. The Swansea Bay Tidal Lagoon is, to date, over 85% funded by individuals;
- Offer the chance to be a long term owner of the lagoon. We will offer everyone the opportunity to part-fund construction equity in the lagoon; and
- Empower this and future generations to work with nature and enhance the wellbeing of our planet and everyone who comes into contact with us.

Finally, we want this Project to sow a sense of hope and potential for this and future generations who face the biggest challenges any generation in our history have faced: a high and growing population; limited time remaining to address climate change; and achieving economic sustainability with one planet to support us all.

The aspects of the lagoon proposal that I have laid out above are the reasons why we found such strong public support in Swansea Bay, with 86% of all those responding to statutory consultation supporting our proposals. Collectively, these are the reasons why we believe Swansea Bay Tidal Lagoon is a blueprint for rewiring our electricity industry. These are the reasons why this pioneering project has received so much attention across the UK and beyond, with six other cities already approaching us to see if we would "develop here what you are proposing for Swansea". I believe these are also the reasons why the Government is looking seriously at tidal lagoons as a UK energy source, and why the Crown Estate has recently announced a leasing round for tidal lagoons.

To conclude, the Swansea Bay Tidal Lagoon will address each aspect of the energy challenge – cost, carbon and security of supply. And it will do so in a way that maximises local opportunity, promotes community resilience and pride, offers an alternative business model with ownership at the local or individual level, is super for people, truly provides sustainable energy and sustainable jobs, and enhances the health and biodiversity of the planet.

This Written Representation presents the policy support for the Project and responds to the principal issues set out by the Examining Authority in their letter of 15 May. This representation also presents the environmental, socio-economic, cultural and education elements that comprise key benefits of the Project. Though the examination will rightly consider only the Project and its elements defined in the draft DCO, in light of the ground-breaking nature of the Application, this foreword sets the Project in the context of a wider vision for tidal lagoon power, particularly in the absence of specific government policy.

Mark Shorrock
CEO
Tidal Lagoon Power

1 Law and policy

1.1 Status and nature of the application as a Nationally Significant Infrastructure Project under ss14 and 15 of the Planning Act 2008.

1. In England and Wales, an offshore generating station is considered to be a nationally significant infrastructure project (NSIP) for the purposes of sections 14 and 15 of the Planning Act 2008 (PA2008), if it is in waters adjacent to England and Wales and if its generating capacity is in excess of 100MW.

2. For the purposes of an application for development consent, the Swansea Bay Tidal Lagoon project (the "Project") is deemed to be an offshore generating station (i.e. in waters off Wales, in Swansea Bay) under section 15(3) PA 2008, rather than an onshore generating station.

3. The Project will have 16 turbines with a nominal rated capacity of 20 MW each, which amounts to a total installed capacity of 320MW (continuous) or 240 MW based on four generating cycles each day.

4. Consequently, as an offshore generating station, and with a generating capacity in excess of 100MW, the Project constitutes a nationally significant infrastructure project for the purposes of PA 2008.

5. Under section 31 PA 2008, development consent is required to authorise development of a NSIP and, in the case of a generating station, its operation. TLSB's application for development consent to construct and operate the Project (the Application) has been made in accordance with section 37 PA 2008 and the Infrastructure Planning (Application: Prescribed Forms and Procedures) Regulations 2009.

1.2 Scope of works proposed as the principal development and extent of any associated development to be determined by Welsh Local Planning Authorities.

1. TLSB considers that all of the elements proposed to be authorised pursuant to the draft DCO (doc ref 3.1) are within the scope of the principal development that may be constructed in Wales pursuant to a development consent order granted under the PA 2008.

2. It is acknowledged to be important that the scope of works must fall within the "principal development", as referred to in section 115(1)(b). Otherwise it may not be authorised in Wales unless it is comprised of surface works, boreholes or pipes, associated with development within section 17(3) of the PA 2008. Such development is an underground gas storage facility and hence not analogous to the Project.

3. There are a number of means by which works may form part of a principal development, including those that follow. TLSB considers that development forms part of the principal development (and therefore is not associated development) if it is physically part of or indistinguishable from the principal development. Similarly development which is integral and without which the principal development could not function is not associated development. Further, essential mitigation or enhancement incorporated by design within the Project forms part of the principal development.

4. Applying these principles to the works comprised in Part 1 of Schedule 1 to the draft DCO results in the following analysis:

    a. Work No. 1a and 1b - the sea walls are part of the principal development as they are they means of containing or excluding the water required for conversion from kinetic energy to electrical energy. Therefore, they are as much a part of the principal development as the turbine housing or boilers of a fossil fuel generating station or the pressure vessels surrounding a nuclear reactor for a nuclear development.

    b. Work No. 2a (re-numbered) - the turbine structure is the means by which the kinetic energy stored in the lagoon is transformed into electrical energy. It is part of the principal development and indistinguishable from it. It is as integral to the process as the turbines in a fossil fuel, nuclear, energy from waste/biomass or wind turbine generating station would be.

c. Work No. 2b - this work is required in order to ensure that the Project can be constructed, it is part of the construction of the Project, but since it comprises a substantial work capable of interfering with navigation is separately identified.

d. Work No. 2c - this work comprises dolphin piles which are to be constructed to ensure that the Project is protected from and the public protected in relation to the operation of the Project. It is an essential part of the Project because it provides for safety. This is equivalent to a fence on a terrestrial power station.

e. Work No. 2d - comprises a similar work to work No. 2c within the lagoon itself with a similar purpose and having a similar effect.

f. Work No. 3 - comprises the diversion of a utility required for the Project as a whole, namely the long sea outfall of the DCWW Swansea Bay Waste Water Treatment Works. This utility diversion would be authorised for a project to be constructed on land and accordingly falls within the scope of mitigation that is essential for the delivery of the Project and part of its construction. Where the work crosses Work No. 1b, it will be integral to the structure of the Project.

g. Work No. 4 - in a similar way, a new eastern training wall in the River Neath, is mitigation to ensure that a right of navigation, akin to a protection of a land-based right of way, is suitably treated to enable the Project to go ahead.

h. Work No. 5a to Work No. 5j - the grid connection contained in Work No. 5a - Work No. 5j comprise a critical part of delivering the Project, and designed-in supplies of electricity to local users. These works, particularly Works No. 5a to 5h, are an element of the Project which is crucial to securing the delivery of the energy produced by the Project to the National Electricity Transmission System and thence to consumers. The works are required to enable the export of electricity, are integral to the construction of the sea walls identified in Work No. 1 and on land is an essential part of connecting the Project to the National Electricity Transmission System.

i. Work No. 6a and Work No. 6b - relate to the onshore maintenance facilities comprised in the Project, the leisure facilities which form part of its overall delivery and render it particularly acceptable in this location, securing its benefits for the Swansea Bay area.

j. Works No. 7a - Work No. 7g - provide the internal access roads that lie within the application site and connect the Project to the principal highway network. Just as the

driveway for any other type of project if a fossil fuel development or the access-way for a wind turbine development would be dependent upon and include these items so, here, these are a legitimate part of this Project.

k. Work No. 8 is no longer proposed to be constructed (see submission dated 4 June 2014).

l. Work No. 9a and Work No. 9b are integral elements of the project securing accessibility to the benefits that it provides for residents of and visitors to Swansea.

m. Work No. 10 and Work No. 11 comprise essential mitigation/enhancements comprised in the Project and designed in to its construction. Under the NPS (so far as relevant) it is necessary to exercise good design in the delivery of the Project. As such, this type of measure is properly to be included and secured in a development, just as good landscaping principles would apply to a more conventional generating station development.

1.3 Other consents that would be required for the generating station to become operational including the proposed Welsh Marine Licence.

1.3.1 The full list of other consents expected to be required for delivery of the Project is submitted in updated form with these written representations.

1.4 Relevant UK legislation/policy including in National Policy Statements and the Marine Policy Statement.

1.4.1 The UK is obliged to reduce its carbon emissions to 80% below 1990 levels by 2050. The UK is bound by Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources, which sets a target for the UK to consume 15% of its energy from renewable sources by 2020. The Large Combustion Plant Directive (2001/80/EC), which is now part of the Industrial Emissions Directive (2010/75/EU), binds the UK into the closure of large power stations unable to be upgraded to the required standard. This forces the closure of around 20GW[1] of energy generating capacity in the UK.

1.4.2 The resultant gap in the UK's ability to meet its energy needs is the subject of the 2007 White Paper, Meeting the Energy Challenge, which states that renewable energy "*provides benefits shared by all communities both through reduced emissions and more diverse supplies of energy which helps the reliability of our supplies. This factor is a material consideration to which all participants in the planning system should give significant weight when considering renewable proposals.*"

1.4.3 As the Project is an offshore generating station with a capacity above 100MW, it is a nationally significant infrastructure project (NSIP) under sections 14 and 15 of the Planning Act 2008 (PA 2008). Under s104(2)(a) of PA 2008, the Secretary of State must have regard to any national policy statement (NPS) which has effect in relation to development to which the Application relates. Further, under s104(3), the Secretary of State must decide the Application in accordance with any relevant NPS.

1.4.4 The stated purpose of the Overarching National Policy Statement for Energy EN-1 (NPS EN-1) is to set out UK Government policy in Wales and England, in so far as meeting the urgent need[2] for energy infrastructure in the UK, in order to ensure the security of energy supplies[3]. The policy states that the need for nationally significant energy infrastructure projects is established in any case and that the need for renewable energy projects is urgent[4]. Paragraph 3.3.10 of NPS EN-1 accepts that new renewable energy capacity may include generation from wave and tidal power.

[1] DECC, Planning our electric future: a White Paper for secure, affordable and low-carbon electricity (2011)

[2] Paragraph 3.2.3 NPS EN-1

[3] Paragraph 2.2.20 NPS EN-1

[4] Paragraph 3.4.3 NPS EN-1

1.4.5 The Project will have an installed capacity of 320MW (240 MW nominal), from a reliable, predictable, renewable source (being the tides). In this regard, the Project contributes to the policy aims of NPS EN-1, and the Secretary of State's decision should be made in accordance with the need identified and relevant generic assessment principles set out in Part 4 of NPS EN-1. For further detail of relevant policies see TLSB's response to Written Question 1.1.

1.4.6 Notwithstanding this statement, s105 of PA 2008 provides for decision-making where a National Policy Statement has not been designated. Should this be the case, the Secretary of State should have regard to any important or relevant matters. In this case, and insofar as NPS EN-1 is did not apply, it should remain to be considered as the principal relevant policy and significant weight should be attached to the Project's benefits as a renewable energy generating station that will contribute to the identified need for energy infrastructure. See answer to Written Question 1.1 for TLSB's full consideration of this matter.

1.4.7 In relation to this, the potential for the Project to act as an initial step toward the provision of future lagoons around the UK should also be taken into account. This Project will establish tidal lagoon technology as a means for the UK to secure large scale, reliable, predictable, renewable energy in a time frame and at a cost comparable to nuclear and offshore wind technologies. It is intended that tidal lagoons should deliver 10% of the UK's electricity by 2023 should the vision of Tidal Lagoon Power Ltd be realised.

1.4.8 National Policy Statement for Renewable Energy Infrastructure EN-3 (NPS EN-3) *"provides the primary basis for decisions by the [Secretary of State] on applications it receives for nationally significant renewable energy infrastructure"*[5]. However, it is also stated in paragraph 1.8.2 that "*This NPS does not cover other types of renewable energy generation that are not at present technically viable over 50MW onshore or over 100MW offshore such as schemes that generate electricity from tidal stream or wave power. It is expected that tidal range schemes may be the subject of application to the IPC within the near future".*

1.4.9 Given the expectation stated in this paragraph, and given the statement above regarding the applicability of NPS EN-1, it is considered that NPS EN-3 will provide a framework for decision-making in so far as the applicable provisions regarding the assessment of offshore schemes. This may include, but is not limited to, the technical considerations for the decision-maker when determining consent applications for offshore wind farms set out in Part 2, section 2.6 of the policy. The policies considered relevant are stated ion answer to Question 1.1.

[5] Paragraph 1.2.1

1.4.10 National Policy Statement for Electricity Networks Infrastructure EN-5 (NPS EN-5) is an important and relevant matter to the integral underground cable connection. Though relevant to this element of the Project, the purpose of NPS EN-5 is to provide the primary basis for decisions on applications for electricity networks that are NSIPs, therefore its weight in the overall consideration of the Project is limited. This limitation is furthered given that the integral cable route is underground at all points, therefore considerations of the impacts of above-ground electricity connections set out in NPS EN-5 do not apply.

1.4.11 It is considered that the National Policy Statement for Ports is an important and relevant matter, if not a primary basis for decision-making. This is due to proximity of the Project to historic and operating ports, and the recognised relationship between ports and energy provision, in that *"ports will need to be responsive to changes in different types of energy supplies".* This consideration applies in so far as the ports enabling the Project through co-operation, and the need for TLSB to secure proper and appropriate protections for the operation of the ports in the vicinity of the Project.

1.4.12 The NPS is also relevant in terms of its recognition of ports as developments that play an important role in local and regional economies, often through the "cluster" effect that is described in the policy. This relates to the express aims of TLSB's supply chain strategy and other initiatives, which aim to ensure the construction benefits of the Project and future lagoons are captured within the Swansea Bay City Region (Appendix 3 of the Planning Statement, Document 8.2).

1.4.13 The policy is also relevant to the Lagoon's importance to delivering Tidal Lagoon Power Ltd's aim to base a future turbine manufacturing industry in Swansea. This will capitalise on the skills and education commitments that have been invested in by TLSB since the inception of the Project. It is intended that the city region would be the base for knowledge and manufacturing related to tidal lagoons.

1.4.14 The Marine Policy Statement (MPS) is designated under the Marine and Coastal Access Act 2009 (MCAA 2009) and is the overarching marine policy document. MCAA 2009 requires all public authorities that take authorisation decisions which might affect the UK marine area to do so in accordance with the MPS, unless relevant considerations indicate otherwise[6]. The MPS was adopted by all four UK administrations – including Wales – in March 2011.

1.4.15 Consultation by the Welsh Government on a Welsh National Marine Plan has commenced, and its publication is planned for the end of 2015.

[6] MCAA s58 and s59

1.4.16 The MPS establishes frameworks for preparing Marine Plans and decision-making for proposals affecting the marine environment. It aims to ensure that activity within the marine environment contributes to the aim of sustainable development.

1.4.17 Chapter 2 is relevant due to its setting out of general principles for plan and decision-making in order to achieve the UK vision of "*clean, healthy, safe, productive and biologically diverse oceans and seas*". The high-level objectives of the MPS are relevant in terms of their intention for the marine environment to: be used to maximise sustainable activity; contribute to mitigating against climate change; and ensure the protection and possible recovery of biodiversity with a healthy occurrence of habitats[7].

1.4.18 This of particular relevance to the enhancements to biodiversity which are expected as a consequence of the provision of rocky reef habitat and saltmarsh[8]. The proposed extension of the DCWW outfall ensures that water quality in the vicinity of the Project will be improved, as water from the River Tawe is drawn further out to sea and the treated effluent of the outfall is expelled in a more favourable location[9].

1.4.19 Section 3.3 is relevant in that it sets out policy objectives for key activities that take place in the marine environment in terms of energy production and infrastructure development. The policy confirms that *"a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK"*. The MPS highlights that a significant part of the renewable energy required to meet the UK emission and renewable energy obligations is likely to be sourced from the marine environment[10], and confirms that decisions should consider that the need for new energy infrastructure is established in any case, as set out in NPS EN-1.

[7] MPS Box 1, Page 11

[8] ES Chapter 8 paragraph 8.5.9.12 (and repeated elsewhere in the Chapter) "… the artificial rocky reef is expected to have a higher ecological value than the relatively depauparate intertidal habitat"

ES Chapter 9 paragraph 9.6.4.14 "The introduction of the seawall will result in an increase in habitat heterogeneity, which is likely to bring a net benefit to local marine biodiversity."

ES Chapter 11 paragraph 11.5.3.21 "A minor beneficial effect would be expected through the provision of artificial lighting facilitating night time foraging, saltmarsh habitat and the intertidal lag created by operation of the turbines, although the saltmarsh habitat will only favour some bird species"

[9] ES Chapter 7 paragraph 7.8.1.2 (in relation to mixing and dispersion) "The effects of these changes on water quality are generally positive. Changes in the trajectory of the Tawe River plume, and increased exchange of water in the western Bay, causes a small improvement in water quality in this area with the Lagoon in place."

[10] MPS paragraph 3.3.4

1.4.20 Section 3.3 is also relevant as its sets out that decision-makers on energy and infrastructure schemes should take into account: the positive wider, societal and economic benefits of low carbon electricity generation; the potential impact of inward investment in tidal range related manufacturing and deployment activity; and that consideration should be given to the fact that renewable energy resources can only be developed where the resource exists and where economically feasible.

1.4.21 The policy recognises the established state of tidal range technology and that it has potential to provide 15% of the UK's electricity; it is also recognised that innovative technologies (such as tidal lagoons) were being investigated at the time of policy designation (that are now viable). These innovative technologies are recognised as providing significant amounts of electricity with less environmental impact[11].

1.4.22 The policy identifies relevant potential impacts in relation to offshore windfarms, which could be of relevance to the consideration of the Project. It is stated that there is potential for broad scale environmental benefits through: mitigating greenhouse gas emissions from energy production; socio-economic benefits including employment opportunities, export business and energy security; potential biodiversity benefits arising from the introduction of artificial reefs[12].

1.4.23 The policy recognises the potential adverse effects arising from tidal range technologies including barrages. These are identified as potential impacts on migratory fish and bird species and on the hydrodynamics of the estuarine environments in which they are situated. The policy states that "*adaptation and mitigation methods for such impacts may be supported by detailed monitoring programmes and co-ordinated research initiatives"*, such as those proposed in relation to the Project, discussed at section 4.3 below.

1.4.24 The policy's relation to the impacts of a barrage cause it to be of limited relevance to the consideration of the Project, as a Lagoon can incorporate environmental benefits for the intertidal habitats it serves and the nature of its scale means it does not result in the effects on sedimentation that would be experienced as a result of a barrage.

[11] MPS paragraph 3.3.20

[12] MPS paragraph 3.3.23

1.5 Relevant Welsh policy in Planning Policy Wales and in Technical Advice Notes (including TANs 8, 11, 12, 13, 14, 15, 16, 22 and 23), and the relevance of the Welsh Assembly Future Generations Bill, Local Development Plan policies and of any consultation on plan scope, vision and objectives of the proposed National Marine Plan for Wales.

1.5.1 Planning Policy Wales

1.5.2 Planning Policy Wales (PPW) sets out the land use planning policy of the Welsh Government (WG). It translates the WG's commitment to sustainable development into the planning system so that it can play an appropriate role in moving towards sustainability[13].

1.5.3 It is clear that the Project, as a renewable energy scheme of a nationally significant scale, contributes to the delivery of the WG's strategic objectives in line with PPW.

1.5.4 The other integral elements of the Project are also supported by PPW, i.e. the facilities for tourism, leisure and recreation activity which can make an important contribution to the local and regional economy. TLSB has proposed to undertake further benefits in the form of mariculture, education and in relation to the local supply chain that will serve it and future lagoons that are supported by the principles that inform PPW.

1.5.5 Strategic objectives of PPW

1.5.6 PPW states that climate change is one of the most important challenges facing the world and it is imperative to act urgently to reduce greenhouse gas emissions and deal with the consequences of climate change[14]. In this context, it sets out Wales' obligations to achieve "annual carbon reduction-equivalent emissions reductions of 3 per cent per year from 2011 in areas of devolved competence, which include land use planning" and the commitment "to achieving at least a 40 per cent reduction in all greenhouse gas emissions in Wales by 2020 against a 1990 baseline"[15] . Planning to minimise the causes of climate change means taking decisive actions to move towards a low carbon economy, facilitating the delivery of new and sustainable forms of energy generation at all scales[16].

1.5.7 PPW states that *"the Welsh Government is committed to using the planning system to:*

[13] PPW Edition 6 (February 2014), paragraph 1.1.1.

[14] PPW Edition 6 (February 2014), paragraph 4.5 .1.

[15] PPW Edition 6 (February 2014), paragraph 4.5.2.

[16] PPW Edition 6 (February 2014), paragraph 4.5.7.

- *optimise renewable energy generation;*
- *optimise low carbon energy generation;*
- *facilitate combined heat and power systems (and combined cooling, heat and power) where feasible; and*
- *recognise that the benefits of renewable energy are part of the overall commitment to tackle climate change by reducing greenhouse gas emissions as well as increasing energy security."*[17]

1.5.8 Further, PPW directs planning authorities to facilitate the development of all forms of renewable and low carbon energy to move towards a low carbon economy[18]; such that planning policies, decisions and proposals should[19]:

1.5.9 *"Support the need to tackle the causes of climate change by moving towards a low carbon economy. This includes facilitating development that reduces emissions of greenhouse gases in a sustainable manner, provides for renewable and low carbon energy sources at all scales and facilitates low and zero carbon developments";*

1.5.10 *"Support the need to tackle the causes of climate change by moving towards a low carbon economy. This includes facilitating development that reduces emissions of greenhouse gases in a sustainable manner, provides for renewable and low carbon energy sources at all scales and facilitates low and zero carbon developments"*

1.5.11 *"Promote a low carbon economy and social enterprises."*

1.5.12 <u>PPW update</u>

1.5.13 It is important to note that PPW is regularly monitored and reviewed in relation to the Welsh Government's objectives for Wales[20]. Edition 6 was published in February 2014, soon after the

[17] PPW Edition 6 (February 2014), paragraph 12.8.8.

[18] PPW Edition 6 (February 2014), paragraph 12.8.9.

[19] PPW Edition 6 (February 2014), paragraph 4.4.3.

[20] The Welsh Government's ambition, as set out in the Programme for Government, is to 'create a sustainable, low carbon economy for Wales'; other overarching strategic documents include:

The Climate Change Strategy for Wales, which identifies a target of reducing greenhouse gas emissions by 3% per year from 2011. In terms of energy generation, the strategy identifies that the Welsh Government will "drive reduced energy consumption and improve energy efficiency, and maximise renewable and low carbon energy generation in Wales".

One Wales: One Planet – The Sustainable Development Scheme, which recognises the economic benefits and job creation opportunities of the energy sector in Wales.

Application was submitted. The Planning Statement (document 8.2) and Chapter 5 of the Environmental Statement (document 6.2) sets out the parts of PPW relevant to the Project, with reference to Edition 5. While these parts are still relevant, the updates in Edition 6 are directly relevant to the Project.

1.5.14 The update includes additional policy text (section 12.8) on renewable and low carbon energy to reflect the Welsh Government's energy policy statement, *Energy Wales: A Low Carbon Transition* (2012) and the *UK Renewable Energy Roadmap*. Also, additional policy text is included on planning for economic development (section 7.2), following publication of TAN23.

1.5.15 Planning for renewable and low carbon energy

1.5.16 The Welsh Government aims to secure the infrastructure necessary to achieve sustainable development objectives, while minimising adverse impacts on the environment, health and communities. PPW sets an objective *"to promote the generation and use of energy from renewable and low carbon energy sources at all scales and promote energy efficiency, especially as a means to secure zero or low carbon developments and to tackle the causes of climate change"*.[21]

1.5.17 In addition to recognising the requirements of the EU Renewable Energy Directive including a UK target of 15% of energy from renewables by 2020, and the UK Renewable Energy Roadmap, PPW reinforces the Welsh Government's commitment to deliver an energy programme which contributes to reducing carbon emissions to tackle climate change whilst enhancing the economic, social and environmental wellbeing of the people and communities of Wales in order to achieve a better quality of life for our own and future generations[22], as outlined in the Welsh Government's Energy Policy Statement *Energy Wales: A Low Carbon Transition (2012).*

1.5.18 PPW states that *"planning policy at all levels should facilitate delivery of both the ambition set out in Energy Wales: A Low Carbon Transition and UK and European targets on renewable energy"*[23].

1.5.19 *"The Welsh Government's aim is to secure an appropriate mix of energy provision for Wales which maximises benefits to our economy and communities, whilst minimising potential*

Wales is seeking to achieve a renewable electricity production target of 7TWh per annum by 2020. Low Carbon Revolution – Welsh Government Energy Policy Statement (2010) details how Wales has the potential to produce twice the amount of electricity it currently uses from renewables by 2025, with 40 per cent coming from marine sources.

[21] PPW Edition 6 (February 2014), paragraph 12.1.4.

[22] PPW Edition 6 (February 2014), paragraph 12.8.1.

[23] PPW Edition 6 (February 2014), paragraph 12.8.2.

environmental and social impacts. This forms part of the Welsh Government's aim to secure the strongest economic development policies to underpin growth and prosperity in Wales recognising the importance of clean energy and the efficient use of natural resources, both as an economic driver and a commitment to sustainable development"[24].

1.5.20 PPW states that "*the marine energy resource off Wales offers a unique opportunity to deliver significant renewable energy generation whilst establishing new markets in Wales"*[25]; this is supported by the Project as it will establish a new tidal lagoon industry, creating direct jobs and a related supply chain.

1.5.21 PPW specifies that local planning authorities should make positive provision to facilitate renewable energy development by considering the contribution that their area can make towards developing and facilitating renewable energy, recognising the environmental, economic and social opportunities that the use of renewable energy resources can make to planning for sustainability[26]. At the same time, to observe international and national statutory obligations to protect natural environment and historic designations and ensure that mitigation measures are required for potential detrimental effects on local communities whilst ensuring that the potential impact on economic viability is given full consideration[27]. In particular, the development of large scale renewable energy schemes will not generally be appropriate in internationally or nationally designated areas and sites[28] – this Project is consistent with these policy statements.

1.5.22 PPW also sets out the considerations for local planning authorities for determining renewable energy development and any associated infrastructure[29]. Although these are not relevant to the determination of the Application, they clearly set the framework for determining applications of lesser significance in Wales, and illustrate the importance of strategic considerations for local decision-making (delivering renewable energy, lowering greenhouse gas emissions and climate change mitigation, wider environmental, social and economic benefits). This part of PPW also serves to illustrate how well the Project performs against criteria intended for developments of a smaller scale as the Project addresses the policy that *"developers for renewable and low carbon*

[24] PPW Edition 6 (February 2014), paragraph 12.8.6.

[25] PPW Edition 6 (February 2014), paragraph 12.8.21.

[26] PPW Edition 6 (February 2014), paragraph 12.8.9.

[27] PPW Edition 6 (February 2014), paragraph 12.8.10.

[28] PPW Edition 6 (February 2014), paragraph 12.8.14.

[29] PPW Edition 6 (February 2014), paragraph 12.10.1.

energy developments should seek to avoid or where possible minimise adverse impacts through careful consideration of location, scale, design and other measures"[30].

1.5.23 Local authority scale determination of renewable energy development applications

1.5.24 PPW 12.10.1

1.5.25 In determining applications for renewable and low carbon energy development and associated infrastructure local planning authorities should take into account:

- *"the contribution a proposal will play in meeting identified national, UK and European targets and potential for renewable energy, including the contribution to cutting greenhouse gas emissions;*
- *the wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development;*
- *the impact on the natural heritage, the Coast and the Historic Environment;*
- *the need to minimise impacts on local communities to safeguard quality of life for existing and future generations;*
- *ways to avoid, mitigate or compensate identified adverse impacts;*
- *the impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so consider whether measures to adapt to climate change impacts give rise to additional impacts;*
- *grid connection issues where renewable (electricity) energy developments are proposed; and*

the capacity of and effects on the transportation network relating to the construction and operation of the proposal."

1.5.26 These objectives are addressed by the Project.

1.5.27 Planning for economic development

1.5.28 PPW states that planning for economic development means providing scope to secure the efficient and effective use of resources, and that realistic assumptions should be made about the resources (including financial and natural environmental resources) likely to be available for putting planning

[30] PPW Edition 6 (February 2014), paragraph 12.10.3.

policies and proposals into effect[31]. In the context of the Application, this means recognising that the siting of the Project in Swansea Bay is to harness the reliable renewable energy resource available from the tides in an area that is the second best-placed in the world to do so. And that the technology and techniques are proposed in order to minimise the impacts on the environment of the Bay, while enhancing the experience of its recreational users and minimising the impact on the interests of existing commercial users, such as the ports and commercial fishermen. This location is also important for financial viability as it provides favourable seabed conditions to enable TLSB to reduce construction costs and deliver a viable tidal range scheme with opportunities for additional associated regenerative and recreational benefits. Also, the location of urban centres within the Bay increases the ability of a scheme to deliver additional regenerative and recreational benefits that are unique to tidal lagoons [32].

1.5.29 While it is impossible to build infrastructure of this nature without an environmental impact, the reduction of such impacts has been considered during Project design, and the Project will result in net positive benefits to the Bay[33] in terms of biodiversity[34].

1.5.30 The Project location avoids designated conservation areas, minimises and mitigates environmental impacts. Nevertheless, PPW states that decision-makers *"should recognise that there will be occasions when the economic benefits will outweigh social and environmental considerations"*[35]. PPW directs the promotion of the low carbon economy, and recognises the benefits of clustering and eco-industrial networks[36], which are particularly supported by the Project as it will establish a new tidal lagoon industry, create jobs, develop a supply chain and enhance the local tourism offer[37].

1.5.31 PPW states that decision-making "should take account of the likely economic benefits of the development"[38]. In assessing economic benefits, in addition to job creation and regeneration

[31] PPW Edition 6 (February 2014), paragraph 7.2.1.

[32] See Planning Statement (document 8.2).

[33] See Planning Statement (document 8.2).

[34] See references above

[35] PPW Edition 6 (February 2014), paragraph 7.2.2.

[36] PPW Edition 6 (February 2014), paragraph 7.4.1.

[37] See Planning Statement (document 8.2) – paragraph 3.9.1.3 on page 1-41.

[38] PPW Edition 6 (February 2014), paragraph 7.6.1.

potential, there should be consideration of wider spatial strategies – relevant in this context is the Swansea Bay City Region Economic Regeneration Strategy[39]. The Swansea Bay City Region Economic Regeneration Strategy vision includes that the region becomes a leading UK centre for renewable energy[40] (and also that it is one of the UK's most distinctive and attractive places to live, study, work and recreate – relevant to the other integral elements of the Project, the facilities which can make an important contribution to the local and regional economy through facilities for tourism, leisure and recreational activity).

1.5.32 Other relevant parts of PPW

1.5.33 Conserving and Improving Natural Heritage and the Coast

1.5.34 PPW at paragraph 12.10.1 identifies the relevance of impacts on the natural heritage, the Coast and the Historic Environment for renewable energy developments.

1.5.35 PPW states that *"a key role of the planning system is to ensure that society's land requirements are met in ways which do not impose unnecessary constraints on development whilst ensuring that all reasonable steps are taken to safeguard or enhance the environment";* and recognises that conservation and development can often be integrated such that planning and design can minimise the potential for conflict and create new opportunities for sustainable development[41]. The Project both safeguards the environment through mitigation proposed to address impacts, and through significant environmental enhancements such as coastal grassland and saltmarsh creation and new reef habitat.

1.5.36 To meet biodiversity objectives, PPW states that the planning system should promote approaches to development which create new opportunities to enhance biodiversity, prevent biodiversity losses, or compensate for losses where damage is unavoidable[42] - TAN5 provides more advice on how this may be achieved.

1.5.37 PPW recognises that the most important areas for landscape quality and nature conservation have been statutorily designated[43], and is clear that there should be regard to the relative significance of international, national and local designations in considering the weight to be attached to nature

[39] Swansea Bay City Region Economic Regeneration Strategy 2013 – 2030: http://www.swanseabaycityregion.com/home/strategy.pdf accessed on 17 June 2014.
[40] Swansea Bay City Region Economic Regeneration Strategy 2013 – 2030, paragraph 4.5.

[41] PPW Edition 6 (February 2014), paragraph 5.1.3.

[42] PPW Edition 6 (February 2014), paragraph 5.2.8

[43] PPW Edition 6 (February 2014), paragraph 5.3.1.

conservation interests and should take care to avoid placing unnecessary constraints on development[44]. The Project takes care to avoid impacts to designated sites, as is assessed/reported in the Environmental Statement.

1.5.38 PPW states that in the interests of achieving sustainable development it is important to balance conservation objectives with the wider economic needs of local businesses and communities and where development does occur it is important to ensure that all reasonable steps are taken to safeguard or enhance the environmental quality of land[45].

1.5.39 PPW establishes the importance of the coast for "*the conservation of the natural and historic environment; and tourism, leisure and recreation*"[46]. And recognises the economic potential of the coast to be unlocked in a sustainable manner[47].

1.5.40 Paragraph 5.8.1 highlights that planning control is generally landward of the mean low water mark, noting that the activity then determines the relevant decision-maker. In this instance, it is established that the Secretary of State for Energy and Climate Change is the relevant decision-maker on the DCO, and WG for the marine license.

1.5.41 A key consideration is demonstration that a coastal location is essential[48], a test satisfied by the Project being a nationally significant infrastructure marine renewable energy scheme. Upon satisfaction of this test, the next is to ensure that the development is designed as to be resilient to the effects of climate change over its lifetime, which is assessed comprehensively in the Environmental Statement and the FCA, and addressed in the design.

1.5.42 PPW states that there is also the need to consider the possibility of coastal works causing a transfer of risks to other areas, bearing in mind also that erosion and the risk of inundation are likely to be exacerbated by climate change. This matter is comprehensively addressed in the coastal processes chapter of the Environmental Statement and in the updated FCA[49].

1.5.43 <u>Transport</u>

[44] PPW Edition 6 (February 2014), paragraph 5.3.2.

[45] PPW Edition 6 (February 2014), paragraph 5.5.1.

[46] PPW Edition 6 (February 2014), paragraph 5.6.2.

[47] PPW Edition 6 (February 2014), paragraph 5.6.3.

[48] PPW Edition 6 (February 2014), paragraph 5.8.2.

[49] PPW Edition 6 (February 2014), paragraph 5.8.3.

1.5.44 PPW states that wherever possible the carriage of freight by rail, water or pipeline should be promoted rather than by road[50]. Whereas freight is not directly relevant to this Project, the construction stage will involve the need for freighting of goods, such as rock. PPW states that the same principle of promoting non-road carriage or freighting of goods should apply to developments that would otherwise generate frequent road movement. Construction of the Project will mostly involve movement by sea.

1.5.45 Transport Assessments (TA) are deemed an important mechanism for setting out the scale of anticipated impacts a proposed development is likely to have and to anticipate the potential impacts so that they can be understood and catered for[51]. This is addressed by Chapter 15 of the Environmental Statement.

1.5.46 Section 8.2 of PPW deals with the promotion of walking and cycling. Whilst the broad thrust of this policy is to encourage walking and cycling as an alternative mode of transport, particularly for shorter journeys, it does have some relevance to the Project. Specifically, the opportunities presented for walking and cycling on the seawall should be seen positively within the context of this policy for reasons of public health and wellbeing, and also the potential to link into existing/proposed long distance routes.

1.5.47 Tourism, sport and recreation

1.5.48 Though not the primary purpose of the Project, there are significant opportunities associated with both the Lagoon and the built structure that contribute to the Welsh Government's aim for "*tourism to grow in a sustainable way and to make an increasing contribution to the economic, social and environmental well-being of Wales*"[52]

1.5.49 Specifically, paragraph 11.1.3 gives support for "*the provision of innovative, user-friendly, accessible facilities to make our urban areas… more attractive places, where people will choose… to visit*". This ambition is supported by the works to provide for innovative sporting and recreational activity support that are integral to the Project.

1.5.50 Environmental Risks and Pollution

[50] PPW Edition 6 (February 2014), paragraph 8.5.3

[51] PPW Edition 6 (February 2014), paragraph 8.7.2.

[52] PPW Edition 6 (February 2014), paragraph 11.1.2.

1.5.51 The Welsh Government's objectives as set out at chapter 13 of PPW are to maximise environmental protection for people, natural and cultural resources, property and infrastructure; and prevent or manage pollution and promote good environmental practice[53].

1.5.52 PPW states that special attention needs to be given to minimising and managing the risks associated with climate change. Further, that the precautionary principle should be the basis of planning now, based on the latest climate change scenarios from the UK Climate Impact Programme, and consider how a changing climate is expected to influence environmental risks over the lifetime of new development. Given current uncertainty as to the precise impacts of climate change, PPW advises of the need to ensure that both places and the development that takes place within them remain adaptable. Where it is not possible to avoid building in areas of environmental risk, appropriate design and other adaptation responses will be necessary.[54]

1.5.53 PPW is clear that flood risk, whether inland or from the sea, is a material consideration in land use planning; whilst flood risk can be reduced by using mitigation measures, it can never be completely eliminated.[55] This is also recognised as part of the Project, which is why management of residual impacts are part of the proposals, for example, emergency management planning in the event of an extreme event.

1.5.54 Flooding as a hazard therefore involves the consideration of the potential consequences of flooding, as well as the likelihood of an event occurring. Both these matters have been considered in detail as part of the assessment.

1.5.55 PPW also indicates that there are circumstances where built development such as infrastructure can be built in flood prone areas. The direction is that such infrastructure should be designed and constructed so as to remain operational even at times of flood, and should not increase flood risk elsewhere. Both these matters are considered in detail in relation to the Project; it is designed to remain operational during extreme sea conditions and the assessment conclusions are that the Project is assessed as not increasing flood risk elsewhere (including through surface water run-off problems .

1.5.56 The relevant specific considerations for locating development in areas of flood risk are that new development can be justified in that location despite the flood risk – the Project need to be in such as area in order to generate energy from tidal sources; and that it would not increase the potential

[53] PPW Edition 6 (February 2014), paragraph 13.1.2

[54] PPW Edition 6 (February 2014), paragraph 13.1.4

[55] PPW Edition 6 (February 2014), paragraph 13.2.1.

adverse impacts of a flood event. Again, these matters are addressed by the assessment. As part of this assessment, detailed technical investigations were undertaken to evaluate the extent of the risk.

1.5.57 Air and water quality have been considered in detail as part of the Environmental Statement. There are matters relevant to the Project that are also relevant to pollution control regimes. PPW is clear that control through planning measures should not be sought on matters that are the proper concern of the pollution control authority and that control should not be duplicate matters more appropriately controlled through these regimes.

1.5.58 The risk and impact of potential pollution from the Project insofar as it might have an effect on a SAC is considered a material consideration. The Water Framework Directive is also identified as a potential material consideration. Both matters are comprehensively addressed through a Water Framework Directive assessment and a Habitats Regulations assessment – both reported as part of the Application.

1.5.59 PPW aims to minimise noise and reduce ambient noise levels to an acceptable standard. In line with PPW, a comprehensive technical noise assessment was part of the Environmental Statement. This assessment concludes that overall, the noise (and vibration) impacts related to all aspects of the development are likely to be negligible.

1.5.60 PPW also states that there is a need to balance the need of lighting with the effect on the natural environment and amenity. This is considered in the Environmental Statement in relation to ecology and visual impact.

1.5.61 TANs

1.5.62 The Project is considered to be in line with the advice contained in the TANs that support PPW. A full consideration is provided in TLSB's Response to the Written Question 1.5.

1.5.63 Future Generations Bill

1.5.64 The proposed Future Generations Bill is intended to *"help tackle the inter-generational challenges Wales faces in a more joined up and integrated way – ensuring Welsh public services look to the long term"*.

1.5.65 The proposed Bill is being introduced by Welsh Government in summer 2014 to reinforce the fundamental role that public services in Wales play in helping to deliver long-term goals for the future well-being of Wales.

1.5.66 The purpose of the Project is to help address the inter-generational challenge of climate change. Sustainable development is the fundamental principle of the Project, seeking to deliver long-term

social, economic and environmental benefits beyond the immediate delivery of those objectives in the form of renewable energy.

1.5.67 National Marine Plan for Wales

1.5.68 The Marine and Coastal Access Act 2009 (MCAA) sets out the statutory basis for a new plan-led system for marine activities throughout the UK. Marine plans provide the opportunity to manage marine activities in a sustainable way taking into account economic, social and environmental issues.

1.5.69 The new marine planning system for the UK has already begun. All four UK administrations – including Wales - adopting the Marine Policy Statement (MPS) in March 2011.

1.5.70 The MPS establishes frameworks for preparing Marine Plans and decision-making for proposals affecting the marine environment. It aims to ensure that activity within the marine environment contributes to the aim of sustainable development.

1.5.71 The Marine Policy Statement sets out that a secure, sustainable and affordable supply of energy is of central importance to the economic and social well-being of the UK. The marine environment is seen as making an increasingly major contribution to the provision of the UK's energy supply and distribution (paragraph 3.3.1 of UK Marine Policy Statement); *"a significant part of the renewable energy required to meet [the UK's] targets and objectives will come from marine sources"* (paragraph 3.3.3 of UK Marine Policy Statement).

1.5.72 The MPS sets out what issues should be considered by marine plan authorities when developing Marine Plans (paragraph 3.3.4); stating the national level of need for energy infrastructure, as set out in the Overarching National Policy Statement for Energy (EN-1); the positive wider environmental, societal and economic benefits of low carbon electricity generation; that renewable energy resources can only be developed where the resource exists and where economically feasible; the potential impact of inward investment in offshore wind, wave, tidal stream and tidal range energy related manufacturing and deployment activity; as well as the impact of associated employment opportunities on the regeneration of local and national economies - all of these activities support the objective of developing the UK's low carbon manufacturing capability.

1.5.73 Welsh Ministers are the Planning Authority for the Welsh inshore and the Welsh offshore areas.

1.5.74 Consultation by the Welsh Government on a Welsh National Marine Plan has commenced, its publication is planned for end of 2015.

1.6 Given the representations from Natural Resources Wales, the adequacy of the environmental assessment of impacts:

I. on European Sites under the Habitats Regulations;

1.6.1 TLSB does not consider that there will be any significant effects on European protected sites. A detailed consideration of this position is given in TLSB's Response to Written Question 1.15 and in the revised HRA Report and matrices.

1.6.2 The Project site is not within any Special Area of Conservation or Special Protected Area. Potential significant effects of the Project on sites in the wider field of study have been considered. The following sites were taken forward for consideration in the Appropriate Assessment in the updated HRA document submitted with these written representations:

- Burry Inlet
- Cardigan Bay
- Crymlyn Bog
- Kenfig
- Lundy Island
- Pembrokeshire Marine
- Pen Llyn a'r SarnauRiver Usk
- River Wye
- Severn Estuary

1.6.3 TLSB will undertake post-construction monitoring to ensure confidence in the predicted effects, for example proposed monitoring in relation to Kenfig SAC (see Response to Written Question 4.1 (a) paragraph 4).

1.6.4 The HRA report concludes that there will be no effect on the integrity of any Natura 2000 SAC or SPA sites that have been considered as a result of the Project, alone or in-combination with other plans and projects[56].

II. in the Water Framework Directive Assessment (WFD);

1.6.5 TLSB is working closely with NRW to address the matters relevant to WFD. This will be explained in a Statement of Common Ground, in order to demonstrate compliance with the terms of

[56] Report to in Habitats Regulations Assessment (Document 5.4a)

the Directive. An updated WFD Assessment, prepared in line with NRW advice will be submitted to assist the ExA.

1.6.6 Assessment requires examination of the condition of the quality elements which define the status of Swansea Bay water body and any deterioration of these elements at water body level as a result of the Project. The construction of the Project will result in structures being placed within Swansea Bay. Under the terms of the WFD, the assessment is to be based upon the effect of the Project on the existing water body and not upon the water bodies that may exist after the creation of the Project.

1.6.7 It is considered that the Project is compliant with the Directive.

III. on terrestrial ecology and Sites of Special Scientific Interest (SSSIs);

1.6.8 The Project will provide ecological benefits as a result of the encouragement of saltmarsh[57] that will be incorporated in to the impoundment. The Project is also predicted to cause accretion to the forefront of Crymlyn Burrows SSSI, which is will provide protection from erosion events in the short-term and lead to the formation of additional habitat in the medium to long term[58].

1.6.9 For Blackpill SSSI, a minor impact is predicted in relation to features of national importance due to the potential magnitude of habitat modification. Table 6.22 of Chapter 6 of the ES identifies that the likely observed effect upon the area of Blackpill SSSI will be the deposition of mud during storm events. This have no significant effect on the intertidal areas that would cause impact to nationally designated features[59]. In order to ensure the efficacy of the assessment and its predicted effects, TLSB will undertake monitoring of the area of Blackpill SSSI and will undertake beach nourishment activity should this prove to be required in order to protect nationally important features.

IV. on intertidal benthic ecology (including loss of Biodiversity Action Plan Annex 1 habitats and degradation of features including in an SSSI, mitigation, offsetting, omission of Blackpill SSSI baseline data)

1.6.10 Following the refinement of options post-submission of the Application, the Project will use variable speed turbines. As such, during operation there will no longer be a loss in the intertidal

[57] ES Chapter 12 Paragraph 12.5.4.45

[58] ES Chapter Table 6.22

[59] ES Chapter 12 Paragraph 12.4.5.47 and 12.5.7.29, response to Question 3.21

area due to changes in water levels inside the Lagoon, as was the case in the worst case presented in the ES (loss of 62ha of intertidal habitat)[60].

1.6.11 It is likely the Project will provide benefits to foraging birds as a result of the delayed tides, which will provide feeding ground at times where areas outside of the Lagoon are covered during flood tides. This will amount to extra foraging time of 2.5 hours. It is also predicted that artificial lighting during winter months could provide benefit to bird species who can exploit extra foraging time on the intertidal habitat[61].

1.6.12 These benefits will be secured through the provision of quiet areas in the north-eastern extent of the impoundment. It is also proposed to provide roosting islands within the impoundment to allow for the foraging of birds. The use of spawning media and bio-blocks to encourage habitation of the rocky-reef provided on the wall and the resultant increase in bio-diversity will further benefit foraging species[62].

1.6.13 The assessment predicts that the main impacts on marine ecology arising from the Project relate to protected features such as: Sabellaria; hydroid rockpools; intertidal mudflats and sandflats; and subtidal sands and gravels. The pathways with the potential highest impacts on these protected features are the deposition of suspended sediments during construction, change in habitat extent and suitability, change in suspended sediment concentrations and the potential spread and introduction of non-native species during operation.

1.6.14 Mitigation measures have been identified in order to reduce the residual impacts to acceptable levels, including: the adoption of published guidelines and best available practice techniques during construction activities to ensure that the spatial extent and concentration of suspended sediment created by the Project are limited; adoption of good practice to ensure that releases into the marine environment are minimised and contingency measures will be in place should such a spillage occur; and following of appropriate legislation and guidance as well as the implementation of best practice to limit the introduction and spread of non-native species. A summary of effects and mitigation is provided in table 8.10 and ES Chapter 23. Impacts on other receptors are acceptable.

1.6.15 The acceptable impacts on protected receptors should be weighed against the overall benefits of the scheme in relation to its potential to enhance habitats for other valuable species. This is further to its role in mitigating against climate change as a renewable energy generating station, which, as

[60] ES Chapter 6 paragraph 6.5.2.21

[61] ES Chapter 11 Paragraph 11.5.3.16

[62] ES Chapter 11 Paragraph 11.9.0.7

stated in NPS EN-1, is vital to avoiding future significant adverse impacts to biodiversity as a result of the effects of climate change[63]. The Project provides a unique opportunity to mitigate the effects of climate change while providing ecological enhancement to the immediate environment.

1.6.16 The omission of Blackpill SSSI baseline data is considered in detail in response to Question 1.15

V. on sub-tidal ecology (including uncertainty over areas, effects and dredge disposal);

1.6.17 The loss of subtidal habitat as a result of the construction and operation of the Project is presented in tables 4.4a, 4.4b and 4.5 of ES Chapter 4, Project Description. There will be an overall loss of 41.45ha, 0.40% of the wider Bay area, with the use of variable speed turbines. This will be offset by the rocky reef habitat that will be provided in the sub-tidal environment, which will serve as an enhancement to the environment and will have a resultant benefit for biodiversity[64].

1.6.18 It is anticipated that maintenance dredging within the Lagoon will not need to start until 10 to 15 years after the completion of construction and then be performed approximately every two to five years. It is assumed that small, modular, dredging equipment will be brought to the Lagoon by sea (or by road, in sections) and launched into the Lagoon to collect sediment deposits. Materials will be pumped over the Lagoon wall into another vessel and disposed of at the Swansea Outer Spoil Ground. The maintenance dredging licence (for the lifetime of the project) is not part of the DCO but a marine license will be sought from the Welsh Government (WG) at the appropriate time.

VI. in relation to bio-security;

1.6.19 An initial assessment of invasive non-native species has been provided within the ES at Chapter 8 (section 8.5.6 and 8.5.14) and standard accepted mitigation measures are identified. The residual risk has been identified as insignificant to minor adverse for construction and operation. Please refer to TLSB's Response to Written Question 5.11.

1.6.20 In addition to this, a bio-security risk assessment will be undertaken by the appointed contractor and will be managed through the marine license to be granted by WG. Since submission of the Application, contractors have been identified and the need for a detailed bio-security risk assessment will be secured through the CEMP together with appropriate measures to ensure no new species are introduced to the Bay area.

[63] NPS EN-1 Paragraph 5.3.5

[64] See references above

VII. on fish (including assessment approach, modelling parameters, impacts of sediment levels on fish spawning including interaction with climate change, uncertainty over monitoring and mitigation proposals);

1.6.21 The assessment of impacts on fish has been created by a UK leading expert team at Turnpenny Horsfield who have practised the assessment of fish movements and fish behaviour in the River Severn and its estuary over the last 20 years. It is based on all known peer reviewed scientific fish papers that study the Severn, including international papers, on any of the species found in the Severn. It is also founded upon trawl data gathered from Swansea Bay.

1.6.22 The assessment uses two models; an Individual-based model (IBM), which is a random model based on known behaviour characteristics per fish species, and the STRIKER™ v.4 model.

1.6.23 The injury risk associated with a single pass of a fish through a turbine was estimated for different species and life-stages of fish using the STRIKER™ v.4 turbine passage model. The size of fish is based on existing data sets and survey data specific to the Project. The STRIKER™ models have been widely used in UK, Germany, Canada, and USA based hydropower assessments and are founded on stress-response relationships. Full detail of the model is provided in Appendix 9.4 of the ES. The STRIKER™ model shows how many fish swimming through a turbine draft tube will get hit by a turbine blade. It is an impact modelling tool perfected over the last 30 years in run of river hydro plants worldwide. Full detail of the model is provided in Appendix 9.4 of the ES.

1.6.24 The IBM model is a built up model which applies a series of set rules per species based on peer reviewed scientific literature. The set rules are applied on top of the known currents in the bay. 10,000 individuals are then modelled with many different starting positions across the bay. Each model run randomises behaviour based on behaviours per species and species size, in order to model how many individuals swim close to the turbine inlets. This process is continued until the worst case scenario is established. It is assumed that any fish that swims near the turbine inlet will seek to enter the lagoon. At this point in time, mortality rates are assessed by the STRIKER™ v.4 model (explained above), and in this way the worst case is established and used for assessment. A detailed explanation of the model is provided in Appendix 9.3 of the ES.

1.6.25 In general, impacts on fish tend to be greater in fixed speed turbines as generation head decreases, water speed reduces but turbine rpm remains the same. With variable speed turbines, such as those TLSB will use, the impact is reduced due to the reduction of risk to fish swimming through turbine draft tubes and their interaction with the blade and water speed.

1.6.26 The above modelling shows negligible impact on fish species with the exception of herring and sea trout. With the introduction of spawning media outside the lagoon and acoustic deterrents, the effect on these two species is minor[65].

1.6.27 The effects of the Project on migratory species that use the Tawe and Neath are not significant, as predicted by the robust modelling presented above[66].

1.6.28 With regard to the impacts of sediment levels on fish spawning during construction; the level of this impact is considered acceptable given its temporary nature and the mitigation measures proposed and secured in the CEMP[67].

1.6.29 Where possible the ES has considered the effects of climate change and other anthropogenic pressures on, and in combination with, the Project. However, the effects of climate change on fish populations are difficult to quantify or predict. The Project will last 120 years and, although it is understood that climate change and other anthropogenic pressures will likely have an effect on fish populations, no meaningful assessment can be made. The issue of sea level rise has been reviewed in this context. Changes in sea level as a result of climate change may impact on the generation head created by the lagoon, but any change would be rendered insignificant by use of variable speed turbines, as expected.

1.6.30 The potential for the Project to provide enhancements through the provision of rocky reef habitat and measures proposed by TLSB should be weighed against the limited and temporary impacts on fish. The importance of the Project's contribution to mitigation against climate change should also be taken into account, insofar as considering the significance of the impacts to all fish species should predictions of the effects of climate change not be mitigated.

VIII. on coastal birds (including Sanderling / Ringed Plover and Great Crested Glebe) and,

1.6.31 The assessment of impact on Great Crested Grebe has concluded that the expected general increase in fish biodiversity as a result of the Project, the presence of alternative habitat for prey fish species, and the areas of habitat unaffected by dredging within the Lagoon, will result in continued foraging opportunities[68].

[65] Tables 9.28 – 9.37 ES Chapter 9

[66] Table 9.32 ES Chapter 9

[67] Paragraph 4.0.0.12 ES Appendix 6.4.4.1

[68] ES Chapter 11 paragraph 11.5.3.25

1.6.32 The assessment also considers that there will be no residual impact on Great Crested Grebe. The Chapter 9 assessment on fish has been used to inform the assessment, with herring being an important food source for Great Crested Grebe[69]. The assessment on herring has shown most effects to be acceptable with mitigation in place. As such there should be no detrimental impact on Great Crested Grebe through loss of herring food source during the operation of the Project[70].

1.6.33 The assessment of potential changes to mud transport shows no predicted increase in deposition of mud material within the Blackpill SSSI, with any changes predicted to occur in the subtidal part of the Bay. This potential small increase in subtidal sedimentation is not predicted to affect the intertidal feeding areas favoured and utilised by the Sanderling and Ringed Plover populations[71]. See response to Question 1.15.

1.6.34 The potential for the Project to provide long-term enhancements through the provision of foraging ground, sea reef and other measures should be weighed against the limited and temporary impacts on coastal birds. The importance of the Project's contribution to mitigation against climate change should also be taken into account, in so far as considering the significance of the impacts to all fish and bird species should predictions of the effects of climate change not be mitigated.

IX. on the value of heritage assets

1.6.35 The Project will have no impact on any historic landscapes[72]. In terms of affected assets, it is considered that the Project will enhance known assets, such that the WWII features have been embodied in the design of the onshore elements of the Project. Unknown assets will be managed through requirements to ensure a written scheme of investigation to be agreed with the Local Authorities prior to the commencement of the scheme.

1.6.36 It has been determined in agreement with Cadw that there would be no significant impact upon the designated assets assessed.

[69] ES Chapter 11 paragraph 11.5.3.25

[70] ES Chapter 11 table 11.12

[71] ES Chapter 11 paragraph 11.5.2.44

[72] ES Chapter 13 paragraph 13.8.5.25

1.7 Any transboundary issues affecting another European Economic Area state

1.7.1 On the basis of the information provided in the Scoping Opinion (submitted to the Planning Inspectorate in October 2012), the Secretary of State concluded on 2 January 2013 that the Project would not be likely to have any significant effects on the environment in another EEA state.

1.7.2 The Project was re-screened in response to the acceptance of the Application on 25 March 2014, taking into account the following changes from the original opinion:

- New information regarding the description of the proposed development;
- Additional plans/projects identified including the cumulative impact assessment; and
- Identification of additional European Sites beyond those identified at the scoping stage and identification of likely significant effects.

1.7.3 Taking this into account, and following the precautionary principle, the Secretary of State concluded again that the Project is not likely to have a significant effect on the environment in another EEA state. TLSB concurs with this conclusion.

2 Renewable energy generation and climate change

2.1 The extent to which the proposal would deliver renewable energy.

2.1.1 The installed capacity of the tidal range generating station will be 320MW, and the nominal rated capacity (based on average head) will be 240MW. TLSB has developed an advanced, bespoke, power output model and will continue to undertake power optimisation work for the life of the Project. The Project is currently expected to provide in excess of 500GWh power output each year, enough for over 156,000 homes or c.11% of Welsh domestic electricity customers[73].

2.1.2 All energy generated is from a renewable source, being the tidal range of Swansea Bay, therefore all electricity produced will be renewable. Furthermore, energy generated will be wholly reliable and predictable (for 14 hours each day), in contrast to other sources of renewable energy such as solar, wind or wave technologies which are both intermittent and variable (i.e. unpredictable and exhibiting undesired/uncontrolled changes in output).

2.1.3 Renewable energy targets bind the UK to sourcing 15% of its total energy consumption (including electricity, heat and transport) from renewable resources by 2020. The UK's National Renewable Energy Action Plan sets the following renewable generation targets for meeting the overall target: electricity 30%, heat 12%, transport 10%. The latest DECC DUKES figures (2012/2013)[74] show progress as follows: electricity 10.8%, heat 2.3%, transport 3.2%. Based on current trends, the UK will fail to meet its heat and transport targets, reaching only 4% for heat and 5% for transport by 2020. New sources of electricity from renewable energy will be expected to fill this gap[75] – tidal lagoons are one of few options that can deliver at scale.

2.1.4 'Energy Wales: A Low Carbon Transition Delivery Plan' (March 2012) states the desirability of marine energy provision in three aspirational scenarios: 60MW in the next 3-4 years; 300MW in the next decade; 1GW in the next 10-20 years. The Project's 320MW of installed capacity would exceed the first two targets by 2018, four years early. Tidal Lagoon Power Ltd's aspirations for second and subsequent lagoons would exceed the third target by 2023, around nine years early.

[73] Based on Ofgem average household consumption of 3,200kWh/annum: https://www.ofgem.gov.uk/ofgem-publications/74735/tdcv-review-consultation.pdf

[74] *https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/279547/DUKES_2013_Chapter_6.pdf (Table 6.7)*

[75] Source: Renewable UK.

2.1.5 By TLSB's assessment, some 127 Relevant Representations were made that support the principle of the Project's provision of renewable energy, the need for the Project and/or its contribution to mitigation against climate change.

2.1.6 The Project represents a significant, single-project, contribution toward the 2020 renewable energy target, and therefore to the aims of NPS EN-1, which states the need for renewable energy projects in terms of their potential to meet this target. The contribution must also be viewed in the context of opportunities for second and subsequent lagoons. If the Tidal Lagoon Swansea Bay is not consented, future lagoons are unlikely to be developed as the perceived investment risk will be too high; and the opportunity for tidal lagoons is likely to be lost for the foreseeable future, along with a key component in diversifying and securing UK energy supply. However, Tidal Lagoon Power Ltd's programme to deploy a further five full-scale tidal lagoons following Swansea Bay currently shows 15GW of new installed capacity by 2027, and 30TWh of annual electricity by 2027. This is equivalent to 9% of current UK electricity demand, or 30% of UK household electricity demand. Further, this is the equivalent of 4,333 offshore wind turbines or ten nuclear reactors[76].

[76] Installed capacity of six tidal lagoons, 15.6GW; London Array, 3.6MW per turbine; Hinkley Point C, 1.6GW per reactor.

2.2 The contribution the development would make in addressing climate change mitigation and its adaptability to climate change impacts.

2.2.1 The Project is a renewable energy generating station that will produce over 500GWh of renewable electricity annually. This represents carbon savings of at least 236,000 tonnes per annum once the Project reaches carbon neutrality after about 5 years of energy generation[77]. This represents a significant contribution to mitigating climate change under the policies set out in section 1.4 to 1.5 above.

2.2.2 The US Environmental Protection Agency Greenhouse Gas Equivalencies Calculator[78] turns an annual carbon saving of 236,000 tonnes into everyday terms as follows:

- Equivalent to annual greenhouse gas emissions from: 49,684 cars, or 84,588 tonnes of waste sent to landfill
- Equivalent to annual carbon emissions from 26.5m gallons of petrol consumed, or 115,000 tonnes of coal burned.

2.2.3 The Project has been designed to adapt to climate change, taking into account the proposed length of its life-cycle. The proposed seawall level of +13.5m CD includes an allowance for the expected sea level rise of 0.315m over a 50 year period, which is the 95% confidence level for a median scenario as based on the latest IPCC report. After this period, the need to raise the rock armour of the sea wall will be assessed and can be implemented if necessary. The location and design of onshore buildings have been determined to ensure they are resilient to predicted sea-level rise for the life of the Project.

2.2.4 Commensurate with the vision of Tidal Lagoon Power Ltd, it should be considered that the Project is potentially the first of a network of lagoons that have the potential to provide 10% of the UK's electricity. This potential would provide a significant contribution to meeting the Energy Challenge set out in NPS EN-1.

2.2.5 The nature of the energy garnered from the tides through a network of lagoons would be predictable and reliable in nature; this energy can therefore help to replace the base load required by the grid which is currently provided by fossil fuel generating stations. This represents a

[77] Appendix 5.1 of ES – calculations based on output figure at submission, 400GWh.

[78] http://www.epa.gov/cleanenergy/energy-resources/calculator.html

significant step to mitigating against the effects of climate change which underpins UK and Welsh energy and planning policy.

2.2.6 The Project is adaptable to climate change, as set out in the Application. It is envisaged that all future lagoons will be adaptable to climate change, allowing for generation in perpetuity theoretically. In certain contexts, other lagoons may have the ability to enhance the surrounding areas' adaptability to climate change by acting as a flood defence.

2.2.7 These matters further the extent to which the Project (and its role in Tidal Lagoon Power Ltd's vision for a network of lagoons) contributes to the mitigation of climate change in its widest sense.

3 Construction process, dredging and physical processes

3.1 Scope for the Development Consent Order to include/exclude design/works options.

1. The draft DCO submitted with the Application provides for the authorised development to be described by reference to land and works plans identifying the locations for construction of the works comprised in the Project. Such plans will be certified under the DCO pursuant to article 46.

2. Further, requirement 5, at Part 3 of Schedule 1 to the DCO, provides that the authorised development must be carried out in accordance with both the planning drawings, which are scheduled at this requirement of the DCO , and the principles contained in the design and access statement submitted with the Application (doc ref 8.1).

3. Consequently, any optionality in respect of the authorised development is addressed by the relevant plan(s) and the wording of the DCO, but only so far as the plans allow. Any scope for the DCO to include design/works options is comprised in the plans and relevant supporting documentation submitted with the Application, which is limited in extent.

3.2 Use of geotubes, extent of fill generally, using dredged rock and using rock imported to the site.

3.2.1 The design of the seawall is determined by the need to retain water with minimum leakage. This requirement dominates the design of the core material, which needs to be sufficiently impermeable. The viable method is to construct the core from granular material like sand, sometimes in combination with a cut-off screen. This has been chosen for the Swansea Bay Tidal Lagoon because sufficient sand is available from within the Lagoon footprint area.

3.2.2 Direct and uncontained placement of sand in marine circumstances will lead to very flat and uneconomical structures. The sand-water mixture will typically form slopes of 1:5 to 1:10 underwater, which is then further flattened by the effect of tides, waves and currents. In order to contain the sand and minimise the volume in the seawall, TenCate Geotube systems® offer an option which aids the viability of the scheme.

3.2.3 For the Project, a method has been developed for the direct filling and laying of the TenCate Geotubes® using a dredger for the supply of a sand-water mixture and a modified laying barge to install the TenCate Geotube® system in an efficient and accurate manner, within the required range for the construction programme.

3.2.4 The simultaneous placement and filling of the TenCate Geotube® system allows for much higher production rates, which is a key contributor to the viability of the Project. This process also has lower risk of damage to the TenCate Geotubes® material, because less equipment and movements are involved (continuous process instead of multiple steps).

3.2.5 The alternative option, which is less likely on grounds of viability, will be the use of quarry run bunds[79]. Quarry run is defined as the by-product from a rock armour quarry. This can be bulk placed (as opposed to individual placing of large armour stones) and is normally done with side stone dumping vessels or split barges. Depending on the properties of the quarry run and the sand infill in between, an additional (geotextile) filter may be required on the inside of the quarry run bunds to prevent washing out of the infill material. A preferred method would be to place a wider bund or select coarser sand as infill to avoid the potential technicalities involved with accurate placement of a geotextile layer in marine conditions. The material would need to be transported to the site by barge.

[79] Discussed in paragraph 4.3.1.6 ES Chapter 4

3.2.6 The extent of the required fill material that will be dredged from the footprint of the Lagoon for the seawall and Geotubes® is 7.3 million cubic metres[80]. The total amount of material that will be dredged is 8.1 million cubic metres. This leaves 0.8 million cubic metres of unsuitable material that will be disposed of in licenced disposal grounds[81]. Additional dredging will take place at the turbine and sluice gate building, of which 0.5 million cubic metres may be suitable for use in the seawall and 0.5 million cubic metres may not be. These figures have been incorporated into the totals above and apply for both methods of construction.

[80] Page 8 of TLSB application to dredge and dispose of material (Doc 8.5)

[81] As set out in the application for Marine Licence (Document 8.5)

3.3 The extent to which the sustainable transportation of construction materials to the site is achievable and enforceable under all operating conditions, including capacity at the adjacent rail sidings and harbour facilities for the offloading of 2.79mt of rock and rock armour from a Cornwall quarry.

3.3.1 NPS EN-1 recognises that energy infrastructure schemes may have significant impacts on the surrounding highway network, including during construction[82]. The policy states that development consent should not be withheld and appropriately limited weight should be applied to residual effects on local highways, provided that the applicant is willing to enter into obligations, or if requirements can be applied to mitigate impacts[83].

3.3.2 PPW states that traffic as a result of construction should be taken into account when determining applications for renewable energy projects.

3.3.3 Sustainable transportation of material is integral to the Project. The main bulk materials that would have an impact on transport for the Project are: sediment, rock and rock armour, and concrete[84]. Sediment will not be transported on land as it will be sourced from the footprint of the Lagoon and deposited straight into Geotubes®. Rock and rock armour required for in-fill and the external seawall will be supplied by barge from the source quarry (based on an achievable delivery programme that accounts for weather risk). A concrete batching plant will be on-site to ensure transport needs are reduced to raw materials for that plant only.

3.3.4 The sustainable transport of goods will be secured by requirement in the DCO to implement a Construction Phase Traffic Management Plan (CPTMP) which will be agreed with the local planning authorities. This will relate to limiting HGV movements, and guaranteeing the amounts of goods delivered to site by alternative means to road, amongst other measures.

3.3.5 Facilities exist in the vicinity of the site that may allow for the use of rail transport, however the condition of these facilities is poor and detailed viability studies have not been completed to assess their use in the construction of the Project[85]. TLSB has therefore assessed a worst case of using

[82] NPS EN-1 paragraph 5.13.1

[83] NPS EN-1 paragraph 5.13.7

[84] ES Chapter 4 Table 4.6

[85] See answer to Question 3.14

road transport (and found minor adverse impact on the road network), while retaining the option of rail transport should studies prove it viable.

3.3.6 In relation to harbour facilities for the storage of rock and rock armour; it is proposed that these materials will be transported to site and stored in-situ[86] immediately prior to the construction of seawall sections. Harbour facilities will not be required for construction materials and their storage.

[86] Paragraph 4.7.7.13 of Chapter 4 of the ES

3.4 Relocation of existing foul waste water outfall.

3.4.1 The DCWW treatment long sea outfall discharges high quality tertiary UV treated final effluent and occasional screened storm water which is capable of causing localised, temporary deterioration in water quality. It is not a foul waste water outfall[87]. Relocation of the outfall is proposed as an enhancement; if water contact sports were not proposed in the Lagoon impoundment, then no such works would be required for mitigation.

3.4.2 The long sea outfall will be relocated to outside the Lagoon impoundment as detailed in paragraph 4.9.9.9 of Chapter 4 of the ES and shown on Works Plans 2.2.9 and 2.2.10 following agreement being reached with DCWW. Further detail regarding the effects of option elimination is provided in TLSB's Response to Written Question 3.15.

[87] Paragraph 4.3.9.4 of Chapter 4 of the ES

3.5 Extent of effects of dredging including mobilisation of contaminants (such as heavy metals) and licensing of dredging.

3.5.1 The Interim Marine Aggregates Dredging Policy (IMADP) seeks to ensure sustainable decision-making to meet society's needs for dredged aggregates. The policy applies where proposals seek a Government View regarding the grant of consent by the Crown Estate for the extraction of marine aggregates. The Project will be extracting marine aggregate only from the footprint of the Lagoon as part of the lease agreement with the Crown Estate, therefore a Government View on the extraction of aggregate from the Crown's estate is not required. The dredge and use of material will be secured through marine licence.

3.5.2 Policy SP1 states that the Welsh Government considers the use of marine aggregates will continue for the foreseeable future where it remains consistent with the principle of sustainable development. Policy SP6 seeks to ensure that "*applications address cumulative and in-combination effects to permit appraisal of the environmental capacity at the scales of the Severn Estuary and Inner, Central and Outer Bristol Channel areas*." SP10 applies a precautionary approach to the reaching of a Government View where one has not been reached before, setting out the need for background information about the sediments in question and, where appropriate, surrounding areas.

3.5.3 For the construction of the Lagoon, 8.1 million cubic tonnes of material will be dredged from the footprint of the Lagoon, 7.3 million cubic tonnes of which will be used for the construction of the Project[88]. The remaining material will be disposed of at licensed dredge sites.

3.5.4 During construction, the impacts of dredging relate to the suspension of sediment and the potential for deposition as a result of this[89]. Swansea Bay can be characterised as a dynamic environment[90]. Due to this, though there will be an increase in suspended sediment values, the impact will be short term[91], meaning values will return to the peak natural background[92]. As such, deposition as a result of this will be limited in magnitude and extent[93].

[88] Paragraph 4.3.1.13 of Chapter 4 of the ES

[89] Table 6.21 Chapter 6 of the ES

[90] Paragraph 6.3.5.4 Chapter 6 of the ES

[91] Paragraph 6.5.1.34, 6.5.2.44, 6.5.2.48 Chapter 6 of the ES

[92] Paragraph 6.5.1.15, 6.5.1.19, 6.5.1.30, 6.5.1.69 Chapter 6 of the ES

[93] Tables 6.20 – 6.22 Chapter 6 of the ES

3.5.5 Any effects on ecological receptors, including cumulative effects, will be managed through the adoption of published guidelines and best available practice to ensure the minimisation of concentration of suspended sediments. Any effects on Swansea Port and Neath Port approach channels will be managed through protective provisions in the DCO.

3.5.6 The impacts of dredging during construction have no significant effect as presented in table 6.22. While moderate/minor impact has been identified on Blackpill SSSI during construction, this will be managed through monitoring and mitigation detailed in table 6.23 of the ES including beach nourishment should effects greater than natural variation be attributable to the Project.

3.5.7 During the operation of the Lagoon, maintenance dredging is not anticipated to be required for the first 10 to 15 years[94]. Sediment will be disposed of at licenced disposal grounds, with no significant effects predicted in the assessment carried out for the Project[95].

3.5.8 CEFAS guidance states "*In general, contaminant levels in dredged material below Action Level 1 are of no concern and are unlikely to influence the licensing decision. However, dredged material with contaminant levels above Action Level 2 is generally considered unsuitable for sea disposal […] Dredged material with contaminant levels between Action Levels 1 and 2 requires further consideration and testing before a decision can be made*"

3.5.9 The results of the contaminant analysis are presented in paragraph 6.4.4.3 to 6.4.4.4, appendix 6.3 and table 4.2 of the ES. The majority of contaminants (73.5%) are below CEFAS Action Level 1, and all sediments are below Action Level 2. The consideration of contaminated sediments between Action Levels 1 and 2 will be undertaken as a condition of the marine licence.

[94] Paragraph 4.8.6.4 Chapter 4 of the ES

[95] Table 6.21 Chapter 6 of the ES

3.6 Sourcing of rockfill imported to the site and any necessary consents required.

3.6.1 There are two main elements required for the construction of the Project that can be defined as "rockfill": quarry run fill and rock armour. The option for conventional construction of the seawall would use quarry run sourced from Dean Quarry. The rock armour will also be sourced from Dean Quarry. Should Dean Quarry prove to be unfeasible as the source of rock, other alternatives are available that will not affect the programme or assumptions made in the assessment.

3.6.2 Dean Quarry contains enough rock for the Project which will be capable of being transported by barge from its coastal location to the Project, in enough time and quantity to deliver the Project to programme (and allowing for weather risk)[96]. Broadly, Dean Quarry requires renewal of operating conditions and a marine licence to be granted by the MMO in order to extend the jetty for efficient loading of barges. Preliminary surveys have commenced should the consent require an EIA. Further detail regarding the consenting process is given in TLSB's Response to Written Question 3.13.

[96] See answer to Question 3.13 (a) and (b)

3.7 Scouring and scour protection/prevention.

3.7.1 Detailed modelling and assessment of the scour protection and prevention has been undertaken as part of the design of the Project[97]. The main issues investigated include: the flow conditions that will give rise to scour formation; an estimate of the likely scour depth for the operating flow conditions; and assessment of suitable scour protection options.

3.7.2 The scour assessment concluded that a scour hole of up to 5m below dredge level of -14.5m (CD) was predicted on the sea side of the turbine house, however, because of the variability of the strata this could extend down to bed rock. A scour hole below -14.5 (CD) may develop on the basin side but should be less deep. The maximum scour depth is limited to 5 to 8m by the presence of hard strata.

3.7.3 As a result of this investigation, a 30m wide scour mattress including 10m wide concrete apron and 20m wide flexible mattress is submitted as part of the design of the turbine and sluice gate housing structure (shown at section 15, plan 2.2.16).

[97] Impacts set out in paragraph 6.5.1.100-6.5.1.102 Chapter 6 of the ES

3.8 Effects on coastal/sand erosion.

3.8.1 NPS EN-1 states that "*Impacts on coastal processes must be managed to minimise adverse impacts on other parts of the coast.*"[98] Particularly in relation to dynamic environments such as Swansea Bay, it should be ensured that applicants have monitoring arrangements, including trigger points for intervention and restoration, in place.[99] The NPS ascribes substantial weight to coastal erosion in decision-making[100].

3.8.2 Planning Policy Wales states that the economic potential of the coast may be unlocked in a sustainable manner, taking into account the constraints identified, including where there is risk of erosion[101]. Development should be resilient to the effects of climate change, and should not affect other areas' ability to be resilient to the effects of climate change in those terms.

3.8.3 Swansea Bay is a dynamic coastal system which experiences erosion, accretion and deposition regularly. Within this system, there are sea conditions where deposition occurs and other sea conditions where erosion occurs, until a new equilibrium is reached. Therefore, all impacts of the Project are subject to considerations of the natural variability of the dynamic system in which it is situated.

3.8.4 Once the Lagoon is constructed, receptors in the western extent of the Bay are more likely to reach a stable beach profile than experienced in recent history, as a result of reduced accretion[102].

3.8.5 There is potential for localised erosion afore the existing coastal defences at Blackpill SSSI[103]. The extent of this potential change will be monitored in the manner set out in the AEMP, and intervention in the form of beach nourishment will be carried out should the monitoring demonstrate change outside of natural variability that is attributable to the Project[104].

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[98] NPS EN-1 paragraph 5.5.11

[99] NPS EN-1 paragraph 5.5.12

[100] NPS EN-1 paragraph 5.5.16

[101] PPW paragraph

[102] Paragraph 6.5.2.59 Chapter 6 of the ES

[103] Table 6.22 Chapter 6 of the ES

[104] Further discussed in 12.5.7.26 – 12.5.7.29 in the ES

3.8.6 There are no significant effects predicted for other parts of the Bay[105]. The Project will not cause any further effects when taking into account the effects of climate change[106]. Within the Lagoon, the much reduced wave climate, and nature of the structure, will serve to protect the impounded foreshore[107].

[105] Table 6.22 Chapter 6 of the ES

[106] Paragraph 6.5.2.46 Chapter 6 of the ES

[107] Paragraph 6.5.2.41 Chapter 6 of the ES

3.9 Extent of maintenance operations provided for by the interpretation of 'maintain' in the DCO.

3.9.1 [This is now dictated and will be inserted prior to despatch]

3.10 Potential silting (within rivers and within and outside the proposed lagoon).

3.10.1 The greatest observed change will be within the Lagoon, which will experience sedimentation in the long term; this will be managed through maintenance dredging and disposal which will be the subject of future marine licences, as described above. This effect will be harnessed to create ecological enhancements, such as saltmarsh and roosting islands.

3.10.2 There is likely to be increased mud deposition within the inner part of the Swansea approach channel, causing an increase of 20-34% for the need to dredge[108]. This impact will be managed through protective provisions agreed with ABP.

3.10.3 There is likely to be some deposition in the Neath approach channel, an increase of between 1.2-2% overall[109]. The amount of deposition is likely to be indiscernible from natural variation. Any changes outside of natural variation attributable to the Project will be managed through protective provisions with the Neath Port Authority.

3.10.4 No change is predicted for the River Neath outside of natural variation. The presence of the Tawe Barrage prevents sedimentation in the River Tawe.

3.10.5 Changes to the extent of 0.3-0.75mm deposition of mud may be experienced in the sub-tidal area of Blackpill SSSI[110] during certain storm conditions. This will not significantly affect any features of the SSSI.

3.10.6 Crymlyn Burrows SSSI is likely to experience accretion, which will result in beneficial impacts due to the protection from erosion in the short-term, and habitat creation in the long-term[111].

3.10.7 There are no significant impacts as a result of siltation inside or outside of the Lagoon. Where impacts are observed, these are manageable through protective provisions in the DCO[112].

[108] Paragraph 6.5.2.74 Chapter 6 of the ES

[109] Table 6.18 Chapter 6 of the ES

[110] See figures 6.50-6.52 of the ES and paragraph 6.5.2.49 Chapter 6 of the ES

[111] Table 6.22 Chapter 6 of the ES

[112] Table 6.20-6.22 Chapter 6 of the ES

3.11 Demolition of eastern breakwater in the mouth of the river Tawe and realignment of the eastern training wall in the mouth of the river Neath

3.11.1 These works are proposed and are not predicted to have any significant impact. They will be carried out as part of the construction of the Project in agreement with the relevant Port Authorities.

4 Species and habitats: impacts on European Sites

4.1 Loss of or change to offshore and intertidal habitats consequent on changes to marine and coastal processes due to construction, operation and/or decommissioning of the project.

4.1.1 The Project is not located within, nor is it adjacent to, any European site. However the potential for mobile qualifying species from such sites to be present within the Application boundary and wider study area, or the possible indirect effects from changes in coastal processes on nearby European sites, means that it is appropriate for the potential for effects on such sites to be considered. A Report to inform the Habitats Regulation Assessment has been submitted as part of the Application (Document 5.5) and an updated version of this document accompanies the submission fo this written representation.

4.1.2 The assessment concludes that there will be no significant effect on any European Sites. Predicted effects on hydrodynamics, waves and sediment transport processes are primarily constrained to Swansea Bay itself. No significant effects are predicted for the wider offshore region (i.e. far-field and outside of Swansea Bay).

4.1.3 Swansea Bay Blackpill SSSI does support habitats that are considered to be functionally linked to the habitats of Burry Inlet SPA. As discussed in section 9.4 of the HRA, the assessment of potential changes to mud transport shows no predicted increased deposition of mud material within the Blackpill SSSI, with any changes predicted to occur in the subtidal part of the Bay. It is not anticipated that increased sedimentation of the subtidal zone will have any impact on any SPA species, as they only utilise the intertidal zone, and to a much lesser extent, habitats above high tide.

4.1.4 The assessment predicts that there will be no significant effect of dredge disposal on Kenfig SAC as the disposal will be within volumes historically disposed of within licensed grounds in the Bay. In order to add confidence to these findings, TLSB is undertaking to monitor beach profile records that are kept in relation to the area. Kenfig SAC has been taken through to the Appropriate Assessment Stage and is included in the updated HRA submitted with this written representation.

4.2 Likely Significant Effects (alone and in combination) on habitats and species at Kenfig, Crymlyn Bog, Pembrokeshire Marine, Cardigan Bay and Pen Llyn a'r Sarnau Special Areas of Conservation and requirement for Habitat Regulations Assessments (including potentially Appropriate Assessment, Assessments of Alternatives, Imperative Reasons of Overriding Public Importance including if necessary compensatory measures). Impacts on species including but not limited to birds, marine mammals, fish, intertidal and subtidal benthic ecology

4.2.1 As stated in Section 1.6 above, the Project is not likely to have any significant effect on any European Protected Sites. Further detail is provided in TLSB's Response to Written Question 1.15.

4.3 Role of environmental monitoring and any triggers for programmed mitigation measures. Securing of such programmes in the DCO.

4.3.1 In considering generic impacts of energy infrastructure, NPS EN-1 stipulates that the applicant should include appropriate mitigation measures as an integral part of the proposed development. In relation to development in areas of dynamic shoreline, the decision maker should be satisfied that the developer will undertake pre- and post-monitoring arrangements with defined triggers for intervention and restoration.

4.3.2 TAN 5 highlights the role of monitoring when addressing nature conservation interests that are uncertain or require the identification of potential effects in relation to the proposed development[113]. It is suggested that monitoring may be necessary to: validate predicted effects; identify departures from predicted effects and assess and report on their significance and any measures needed to remedy unforeseen effects, or to reduce mitigation or compensation measures that are shown to be unnecessary; act as an early warning signal that significant adverse effects may occur if further measures are not taken; measure effects against predetermined thresholds above or below which measures to reduce the effects of development may be scaled down or should be increased, as appropriate.

4.3.3 The Adaptive Environmental Monitoring Plan[114] (AEMP) provides a framework for the monitoring of the Project which will be implemented to ensure the validation of predicted effects, particularly in relation to those effects whose prediction may be uncertain. The AEMP identifies the monitoring measures that will be undertaken in relation to impacts of the scheme, including but not limited to: coastal processes, water quality, inter and subtidal benthic ecology, marine mammals, coastal birds, terrestrial ecology, and noise.

4.3.4 The AEMP identifies appropriate indices for monitoring of these impacts that reflect whether changes are likely to have significant adverse consequence. This forms the trigger point for the implementation of further mitigation measures identified in the Plan. The AEMP relates to the CEMP and OEMP, which will provide the basis for the measures identified through the enforcement of measures on the contactors (carrying out construction) and the operators of the scheme. These documents will be secured by requirement 6 in Part 3 of Schedule 1 to the DCO.

[113] Paragraph 4.3.3

[114] AEMP, ES appendix 23.1

5 Species and habitats: impacts on other designated sites including Sites of Special Scientific Interest

5.1 Mitigation of impacts and residual impacts of project (alone and cumulatively) on Sanderling / Ringed Plover and Great Crested Glebe and on Annex 1 species under the UK Biodiversity action Plan. Impacts of project (alone and cumulatively) on species including but not limited to birds, marine mammals, turtles, fish (including fish spawning and impacts on salmon and trout), intertidal and subtidal benthic ecology.

5.1.1 As stated at section 1.6 above, there is no significant residual impact predicted in relation to Sanderling, Ringed Plover and Great Crested Grebe.

5.1.2 The relevant representation of NRW identified outstanding concerns with regard to marine mammals and the current on-going discussion of the possible designation of the outer Bristol Channel as a SAC. Although not designated or potentially designated, and therefore not considered as such in any assessment, Chapter 10 of the ES has considered all marine mammal species to be of high importance given the high level of protection they are afforded under a range of UK and European Legislation. A European Protected Species Licence will be sought from WG.

5.1.3 Using a precautionary approach, the assumption has been made that harbour porpoise occur at similar frequencies to other parts of Swansea Bay such as Port Talbot. This has informed the assessment which, consequently, considers a worst case scenario.

5.1.4 Since submission of the Application, TLSB has begun monitoring movements of harbour porpoise within the footprint of the Lagoon as part of a long-term monitoring plan.

5.1.5 The Project also has potential to provide benefits to species that could utilise intertidal foraging habitats by extending the amount of time foraging ground is exposed as discussed above.

5.2 Role of environmental monitoring and any triggers for programmed mitigation measures. Securing of such programmes in any Development Consent Order.

5.2.1 See section 4.3 above.

5.3 Habitat creation as mitigation and bio-security.

5.3.1 Bio-security will be managed through the CEMP and OEMP both secured by requirement 6 in the DCO. The initial assessment undertaken in the ES predicts an insignificant risk. Please refer also to TLSB's Response to Written Question 5.11.

5.3.2 Habitat creation will occur as a beneficial impact of the Project. The provision of saltmarsh, rocky reef habitat and the addition to the Crymlyn Burrows SSSI as a result of the scheme are enhancements that will provide beneficial impacts and will be encouraged by TLSB.

5.3.3 The provision of herring spawning media on the seawalls is a mitigation measure to decrease the significance of the impact of the Project on herring, which will lose some current spawning grounds[115].

[115][115] Paragraph 9.5.6.4 Chapter 6 of the ES

6 Shipping, recreational and navigational safety

6.1 Reduced accessibility to the estuary/open sea for pleasure craft etc.

6.1.1 NPS EN-1 states that development consent should not be granted for projects which would interfere with the use of a recognised sea lane, particularly those on which international shipping relies[116]. The policy states that development should minimise effects on recreational craft through the use of appropriate measures such as buffer zones. Where adverse impacts are identified, and no mitigation measures are feasible, the decision-maker should weigh the benefits of the development against its impact on recreational craft.

6.1.2 Following the implementation of mitigation measures in the form of a 500m safety zone demarcated by dolphin piles, booms and the provision of buoys[117], the impact on recreational boating safety will be minor. The Project has been designed to avoid any impact on the shipping channels of the Tawe and the Neath which are used by recreational craft as well as commercial vessels.

6.1.3 The Project will have an impact insofar as the footprint of the Lagoon will not be accessible to recreational craft in the sea outside of it. It is not considered that this will cause a significant impact.

6.1.4 Such marginal adverse effects as might occur are outweighed by the benefits of the scheme, both as a renewable energy generating station, and in terms of the boating facilities that would be provided inside the Lagoon.

[116] 26.6.161

[117] Table 14.9 of the ES

6.2 Marine access to the lagoon and potential for wave echo around lagoon walls.

6.2.1 The Lagoon impoundment will not be accessible from the sea (lock structures are not viable or necessary). The potential for "wave echo" outside the Lagoon is minimal, given the angle of the seawall, which has been designed to absorb 60-70% of wave energy[118]. Further to this, the wave climate within the Lagoon will be of low magnitude due to the impoundment of water, and there will be little wave reflection within the Lagoon itself.

[118] Chapter 4 of the ES

6.3 Siltation of the dredged Swansea Bay and approach channels to rivers Tawe and Neath.

6.3.1 The areas currently dredged in the Bay consist of the Swansea Port approach channel and the Neath Harbour approach channel.

6.3.2 Swansea Port approach channel is predicted to experience siltation 20-34% higher than current levels, and further maintenance dredging will be required. The level of dredging undertaken by TLSB is expected to be agreed with the operators of Swansea Port (ABP) and secured through protective provisions.

6.3.3 The Neath Harbour approach channel is predicted to experience 1.2-2%[119] increase in siltation, a level indistinguishable from the natural variation experienced in the Bay. Should effects attributable to the Project be observed in the channel, TLSB will undertake dredging in agreement with Neath Port Authority, secured through protective provisions.

[119] Table 6.18 Chapter 6 of the ES

6.4 Shipping routes and impacts related to rock transhipment and construction.

6.4.1 NPS EN-3 states that, where a development is likely to affect less strategically important shipping routes, such as those in Swansea Bay, a pragmatic approach could be adopted. The applicant should be expected to minimise negative impacts to as low as reasonably practicable. It is recognised that there may be some circumstances where a re-organisation of traffic activity might be both possible and desirable when considered against the benefits of an application.[120]

6.4.2 Known logistics associated with rock and rock armour delivery for the Project are detailed in section 4.6 (Bulk materials and logistics) in chapter 4 of the ES. Set out within this section are details of the number of vessel movements per week required to transport the rock and rock armour from Dean Quarry and the expected quantity requiring movement. A summary of preceding vessel information has been incorporated into the Navigation and Marine Transport Assessment (table 14.5) and therefore, impacts related to rock transhipment have been assessed, and incorporated into impacts during construction (14.6.1).

6.4.3 The impact in relation to vessel-to-vessel collision risk that could occur as a result of construction activities in relation to transhipment is considered minor adverse due to the infrequency of the potential impact[121]. A marine traffic plan will be implemented by the appointed marine contractor to ensure that transhipment of rock is achieved safely and efficiently.

6.4.4 Swansea Bay is not a shipping lane of strategic importance, therefore the magnitude of the impact allows for the adopted pragmatic approach that has been taken in consultation with relevant port authorities and the MCA.

[120] NPS EN-1 2.6.163

[121] Table 14.8 Chapter 14 of the ES

6.5 Aids to Navigation as provided for in the DCO. Operation of Safety Zones and navigational and marine safety measures.

6.5.1 A power to install aids to navigation are included in the DCO as part of the authorised development at Part 1 of Schedule 1 to the DCO, and will be provided as part of the Project as "further development". It is anticipated that these will include devices for the appropriate demarcation of the seawall and other marine structures, such as buoys, booms and/or lighting, during both construction and operation phases.

6.5.2 In respect of construction of the Project, draft requirement 31 of the DCO provides that no marine works comprised in the Project may be commenced until a navigation safety scheme has been put in place, which must be agreed with the local planning authorities.

6.5.3 Further, the CEMP and the OEMP, both of which are secured by requirement 6 of the DCO, each contain detailed provisions relating to navigation and safety during construction and operation. These include, but are not limited to:

i. Temporary aids to navigation during construction;

ii. Promulgation of information;

iii. Safety zones;

iv. Dolphin piles and floating booms;

v. Guard vessels; and

vi. Marking the Project on charts.

6.5.4 In addition, appropriate safety zones will be established during both construction and operation. These will be the subject of a safety zone application, which will be made to the Secretary of State for Energy and Climate Change, following grant of development consent, under section 95 of the Energy Act 2004. For further details, please refer to the Safety Zone Statement submitted with the Application (doc ref 7.2).

6.6 Navigational rights.

6.6.1 Navigational rights in relation to users of the Ports will not be significantly affected in terms of access to the Ports. Any interaction with navigational rights of the ports will be managed through protective provisions agreed with the appropriate authorities.

6.7 Transfer of Welsh Marine Licence.

6.7.1 NRW-MLT enquired of the ExAs Panel as to the inclusion of this question during the Preliminary Meeting on 10 June 2014, but the Panel was unable to clarify at that stage. TLSB awaits further advice in this respect.

6.7.2 On the basis that this may refer to the benefit conferred by a marine licence: should a marine licence be granted for the Project, TLSB (as the applicant) will be the licence holder. However the conditions of the marine licence will also bind any contractors undertaking the works on TLSB's behalf, so no 'transfer' of the marine licence is necessary. As part of the marine licence conditions, TLSB will be required to notify the MLT of any contractors undertaking the works, and also any vehicles or vessels that are utilised to undertake the works.

7 Fishing

7.1 Impacts on fish movement and fishing areas including along the rivers Tawe and Neath.

7.1.1 NPS EN-3 states that site selection should avoid impeding the protection of sustainable fisheries or fishing activities, particularly at recognised important fishing grounds. The proposal should be designed in consultation with fishing industry representatives. The policy recognises that the construction and operation of offshore wind farms can have both positive and negative effects on fish and shellfish stocks; this is analogous to the effects of the Project to some extent.

7.1.2 Without proposed mitigation measures, the Project would have an impact on herring and sea trout. These impacts will be mitigated through the installation of Acoustic Fish Deterrents which reduce the residual impact arising from turbine collision to minor adverse[122].

7.1.3 During the operation of the Lagoon, herring spawning media on the sea wall will act as mitigation for the loss of spawning areas within the footprint of the Lagoon[123]. The wider provision of rocky reef habitat will result in a net enhancement for biodiversity, which will benefit those species initially affected[124].

7.1.4 The site selection process and Lagoon design took into account environmental considerations relating to fish movement and fishing areas. Locating the Lagoon between the River Tawe and the River Neath avoided blocking the rivers and there will be no significant impact on migratory fish in the Bay[125].

7.1.5 The Project will have no significant impact on migratory fish in the Rivers Tawe and Neath. Post-construction monitoring of smolts as detailed in the AEMP will be carried out to ensure the accuracy of the predicted effects and the efficacy of proposed mitigation measures.[126]

7.1.6 TLSB has proposed enhancements in relation to migratory fish habitats through s106 obligation by investigating contributions to the improvement of fish passes on the Tawe.

[122] Table 9.35 Chapter 9 of the ES and paragraph 9.7.4.19 of the ES

[123] Paragraph 9.5.6.4 Chapter 9 of the ES

[124] Paragraph 9.6.4.14 Chapter 9 of the ES

[125] Paragraph 9.7.3.16 Chapter 9 of the ES

[126] ES Chapter 9 table 9.47

7.2 Impacts on fish stocks, the fishing industry and on recreational fishing.

7.2.1 The most prevalent commercial fishing activity that would be affected directly by the Lagoon is whelk potting around the area of the WWTW outfall.[127] Other fishing interests have been assessed, and the activity in the Bay is of low magnitude[128]. The significance of the impacts experienced are therefore minor to insignificant. [129]

7.2.2 TLSB has engaged extensively with representatives from the commercial fishing industry in Swansea Bay prior to the submission of the Application[130] and continues to do so. The loss of fishing ground is an unavoidable impact of the development, which is outweighed by the Project benefit of providing renewable energy. Further to this, the predicted positive ecological benefits, due to an increase in biodiversity on the rocky reef seawall habitat, has been predicted to have a potential minor positive economic impact on commercial fisheries in the Bay.[131]

7.2.3 Negotiations regarding the loss of fishing grounds are ongoing and TLSB expects to reach agreement with the commercial fishermen in the Bay prior to the end of examination.

7.2.4 In terms of recreational sea angling in the Bay; the majority of the foreshore is owned by ABP and is not publicly accessible. The Lagoon will include areas for angling on its structure, which will benefit sea anglers in the Bay[132]. This benefit is furthered when considered alongside the increase in biodiversity expected as a result of the rocky reef habitat provided by the Project.

7.2.5 The South and West Wales Association of Sea Anglers made a Relevant Representation (no. 188) supporting the potential benefits that the Lagoon would have for their interests in this regard. The representation states that "*We believe that the Tidal Lagoon Swansea Project will benefit sea angling by attracting anglers from a wider area and this in turn will benefit local business. The local community will also benefit by making sea angling safer within the protection of the Lagoon.*"

[127] ES Chapter 9 paragraph 9.6.3.1

[128] ES Chapter 9 paragraph 9.6.3.6

[129] ES Chapter 9 section 9.6.3 and 9.6.4

[130] Document 5.1 (Consultation Report) paragraph 5.4.2.7

[131] ES Chapter 9 paragraph 9.6.4.17

[132] ES Chapter 9 9.7.4.16

7.2.6 As stated in relation to issue 7.1 above, the impact of the Project on fish travelling up the adjacent Rivers will be of such minor effect that it will not impact upon migratory species in terms of recreational fishing. The Project will not affect riparian interests on the Rivers. In spite of the lack of need to mitigate impacts, TLSB proposes to undertake to provide benefits for migratory fish through contribution to fish pass improvements on the Tawe.

7.2.7 TLSB has attempted extensive engagement with angling associations along the Rivers, as presented in Appendix 10.7 of the Consultation Report which details, over 54 pages, the extent of this exercise. It is not predicted that any holder of riparian rights on the Tawe will be able to sustain any relevant claim as a result of the making of the Order, on the basis of the insignificance of the predicted impacts. Therefore, riparian rights holders along the Rivers Tawe and Neath are not affected persons in the context of the examination of the Application.

7.3 Effects of any exclusion areas during construction and operation of the proposal.

7.3.1 NPS EN-3 recognises that applicants may seek to declare safety zones in relation to development, and that these safety zones may include restrictions on activities in sea areas including commercial fishing.

7.3.2 TLSB intends to establish a safety zone[133] relative to the footprint of the Lagoon and the exclusion areas around the turbines in accordance with section 95 of the Energy Act 2004. As the area of the exclusion is relative to the footprint of the Lagoon, the statements above regarding the effects of the loss of fishing grounds are the same effects that will arise as a result of the designation of the safety zone.

7.3.3 The designation of the safety zone will have no significant effect on the Bay.

[133] Document 7.2

8 Flooding

8.1 Residual flooding risk impacts including impacts of flooding and/or severe storms upon proposed structures and on other coastal areas, sea defences and other structures.

8.1.1 The flooding risk to the Project has been assessed comprehensively, and it is concluded that the risk of flooding can be appropriately and effectively managed[134] in line with Welsh Government policy and advice[135]. The potential residual impacts of flooding to the Project, in terms of the potential consequences of flooding, are also manageable. These matters are explained in detail in the updated Flood Consequences Assessment (FCA)[136] submitted with these written representations.

8.1.2 The FCA comprehensively assesses the potential impact of the Project on flooding elsewhere[137]. The Project does not create flooding elsewhere, nor does the Project exacerbate flooding elsewhere[138].

8.1.3 The Lagoon seawall provides significantly enhanced flood protection to the land behind it[139]. This is because the lagoon wall will be built to a height higher than the extreme events benchmarks including climate change allowances for at least 100 years. It is also predicted to protect other parts of Swansea Bay from extreme waves[140]. The lagoon wall can provide direct protection from waves and is engineered to absorb wave energy[141].

8.1.4 The comprehensive assessment found that the lagoon would have no impact on sea levels[142], though it would cause small localised increases to the height of extreme waves under certain conditions[143]. TLSB's initial FCA assessed these small localised changes to extreme waves as not

[134] Section 2.10.3 and 2.10.10.2 of the updated FCA.

[135] PPW and TAN15.

[136] Updated FCA, June 2014.

[137] Section 2.7.8 of the updated FCA.

[138] This is addressed in detail from section 2.7 to 2.10.6 of the updated FCA.

[139] Paragraph 2.6.2.23 of the updated FCA.

[140] Section 2.7.4 of the updated FCA.

[141] Paragraph 2.7.4.16 of the updated FCA.

[142] Paragraph 2.7.3.2 of the updated FCA.

[143] Paragraph 2.7.4.3 of the updated FCA.

having an impact on flood risk. Following advice from NRW, TLSB revisited these conclusions and undertook further assessment, which is reported in the updated FCA[144]. The updated FCA supports the findings that the Project does not increase flood risk or impact on flooding elsewhere[145].

8.1.5 The further assessment undertaken includes an extended assessment of the impacts of sea level rise as a result of climate change impacts[146]. Also, detailed technical modelling and analysis of the predicted small localised increases to extreme wave heights in the vicinity of Mumbles to see how this could potentially translate as a flooding risk[147]. This considered a range of extreme scenarios including consideration of a scenario of extremely low probability sea levels coinciding with extreme wave heights (which in itself has a very low probability of happening)[148]. Analysis included survey data[149] of the relevant part of the coast, review of coastal protection and other structures[150], and analysis of any potential overtopping of these structures[151].

8.1.6 The result of the further work, as reported in the updated FCA, increases the confidence in the conclusion that the lagoon will not increase flood risk or impact on flooding elsewhere.

[144] Updated FCA, June 2014.

[145] Paragraph 2.10.10.2 of the updated FCA.

[152] PPW paragraph 5.5.5

[152] PPW paragraph 5.5.5

[152] PPW paragraph 5.5.5

[152] PPW paragraph 5.5.5

[152] PPW paragraph 5.5.5

[152] PPW paragraph 5.5.5

9 Natural and built heritage

9.1 Impacts on natural heritage features.

9.1.1 Planning Policy Wales states that statutory designation does not necessarily prohibit development, but that proposals should be carefully assessed for their effect on those natural heritage features.[152]

9.1.2 A Natural Features Report was submitted pursuant to Regulation 5(2)(l) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (doc ref 5.4). The report assesses any statutory or non-statutory sites or features of nature conservation such as sites of geological or landscape importance; habitats of protected species, important habitats or other diversity features; and water bodies in a river basin management plan as illustrated on plans 2.3.1 and 2.3.2.

9.1.3 The report concludes that the Project will have no residual effect on the majority of natural features.

9.1.4 Where residual effects have been identified following the implementation of mitigation measures, these are predicted to be of a minor nature. The only moderate effects of development are identified in relation to protected sub-tidal and intertidal features. These features are of limited significance and will be subject to the relevant environmental permits.

9.1.5 It is considered that, overall, construction, operation and decommissioning of the Project will not adversely affect the integrity of natural features in the long term.

[152] PPW paragraph 5.5.5

9.2 Impacts on manmade designated and undesignated heritage assets and their significance.

9.2.1 Planning Policy Wales states that the desirability of preserving an ancient monument and its setting is a material consideration. Where nationally important archaeological remains, whether scheduled or not, and their setting are likely to be affected by proposed development, there should be a presumption in favour of their physical preservation. Where lesser archaeological remains are identified, decision-makers should weigh the relative importance of archaeology against other factors, including the need for development.

9.2.2 A Historic Environment Report was submitted with the Application (doc ref 5.3) pursuant to Regulation 5(2)(m) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. The report identifies and assesses any effects on statutory or non-statutory sites or features of the historic environment, including scheduled monuments, World Heritage sites, listed buildings and other historic structures, archaeological sites and registered battlefields, as illustrated in Figure 1 of the report (terrestrial features).

9.2.3 The report concludes that impacts on marine and terrestrial archaeology will be of minor significance. There is potential for impact upon currently unknown archaeology that will be managed through mitigation measures such as ongoing archaeological investigation. Any effects on known features will also be managed through mitigation.

10 Socio-economic, health and terrestrial traffic and noise impacts

10.1 Impacts upon the local highway network during construction arising from the road transportation of the raw materials required to produce 220,000m3 of concrete as well as other construction materials.

10.1.1 NPS EN-1 states that energy NSIPs may give rise to substantial impacts on the surrounding transport infrastructure, and that the decision-maker should be satisfied the applicant has sought to mitigate these impacts, including during construction. Where mitigation measures are shown to be insufficient, the decision-maker can require the applicant to reduce the impact to acceptable levels. This can include: controlling the numbers of HGV and their movement patterns; making provision for HGV parking; and ensuring satisfactory arrangements for reasonably foreseeable abnormal disruption.

10.1.2 Planning Policy Wales states that impacts arising from construction transport for renewable energy schemes should be taken into account as part of decision-making, considering the capacity of and effects on the transportation network.

10.1.3 The number of HGV movements on the local highway network is predicted to increase by 16% based on the predicted movements presented in table 4.6 in Chapter 4 of the ES; this equates to an average of 82 deliveries a day, or 16 two-way trips an hour. This limited increase is due to the sourcing of sand required for the Project from Swansea Port and the use of a concrete batching plant on-site[153]. The presence of existing Swansea Port traffic limits the significance of movements to site. The residual impact of these movements is minor adverse.

10.1.4 A Construction Phase Traffic Management Plan (CPTMP) will be implemented in agreement with the relevant local authorities prior to the commencement of the Project as secured by requirement in the DCO. This will govern the movements of HGVs to the site to ensure the accuracy of the predicted impact.

10.1.5 The decision-maker should not require further measures in relation to control of HGV movements during the construction phase of the Project due to these limited impacts.

[153] ES Chapter 15 paragraph -15.5.2.9

10.2 Effects upon transport systems, including effects on individual services and bus and rail networks and systems and upon pedestrians, cyclists, motorists, other road users and on rights of way.

10.2.1 Paragraph 8.1.3 of Planning Policy Wales states the Welsh Government's support for a transport hierarchy, with walking and cycling taking priority, followed by public transport including Park and Ride schemes[154], followed by car-based transport. It is stated that car parking should not be provided based on minimum standards, and that authorities should take an integrated approach to parking provision[155].

10.2.2 During construction, the impact on local bus services has been predicted to be negligible, due to the focus on walking and cycling contained in the CPTMP, which will also include measures to promote car sharing[156].

10.2.3 During normal operation, the impact of the Project on buses will be negligible due to the small number of operations staff and the spread of visitors throughout times of peak demand. The predicted impact as a result of major events is of a greater magnitude. However, once measures have been implemented that will be secured through the Major Events Traffic Management Plan (such as the provision of shuttle buses), it has been demonstrated that all junctions considered in the assessment would have capacity to accommodate the additional traffic generated[157].

10.2.4 During construction, the impact on pedestrians and cyclists will be negligible due to the provision of alternative routes where possible and preservation of the key route along Langdon Road[158]. As explain in Section 10.1 above, the design of the construction phase traffic plan will keep the impact of HGV movements to a low level.

10.2.5 During the operation phase, the enhancement to pedestrian and cycling infrastructure is predicted to have a major beneficial impact[159].

[154] PPW paragraph 8.3.3

[155] PPW paragraph 8.4.2

[156] ES Chapter 15 paragraph 15.5.2.22

[157] ES Chapter 15 paragraph 15.5.3.60

[158] ES Chapter 15 paragraph 15.6.1.2

[159] ES Chapter 15 paragraph 15.5.3.58

10.2.6 Though the option of using rail was included in the assessment, and facilities exist in the vicinity of the site that may allow for the use of rail transport, the condition of these facilities is poor and it has not been considered worthwhile to undertake detailed viability studies to assess their use in the construction of the Project. Further detail on this is provided in TLSB's Response to Written Question 3.14.

10.2.7 Those areas that will be affected by the temporary loss of rights of way are shown on plans 2.2.17 to 2.2.28. There will be a temporary diversion of the Wales Coastal Path during construction of the Project.

10.2 Traffic, air quality and noise impacts onshore.

10.2.1 NPS EN-1 states that considerations of air quality should be given substantial weight in decision-making in relation to developments which would lead to a deterioration of air quality in an area.

10.2.2 During construction, it has been assessed that increases in particulate matter due to road traffic will be imperceptible, and nitrogen dioxide concentrations are negligible[160]. Regarding the effects of the construction plant emissions, these will be of minor significance especially following the implementation of best practice guidance. Measures to ensure the efficacy of proposed mitigation will be secured through the CEMP.

10.2.3 The traffic associated with the operational phase of the Project will have a negligible effect on surrounding receptors in relation to air quality[161].

10.2.4 NPS EN-1 states that the decision-maker must not grant development consent where proposals conflict with the aims of: avoiding significant adverse impact on human health from noise; mitigation and minimization of other adverse impacts on human health; contributing to the improvements in health where possible. The decision-maker should consider the use of requirements to ensure noise levels are not exceeded. Planning Policy Wales also states that noise can be a material planning consideration.

10.2.5 The assessment presented in Chapter 19 of the ES predicts that all effects arising from the construction of the scheme will be of acceptable levels or of no significant effect[162]. This is due to the nature of transport to the scheme, being mainly by sea, the distance from residential and other receptors, and the nature of the surrounding levels of existing noise at the operational Port.

10.2.6 The Project is predicted to have no significant effect during its operation; due to the nature of the generating station this will be imperceptible onshore, and it is considered that any noise arising from the recreational and events use of the Lagoon will not be of sufficient significance to affect onshore receptors.

[160] ES Chapter 16 paragraph 16.5.2.4

[161] ES Chapter 16 paragraph 16.5.13.4

[162] ES Chapter 19 sections 19.1-19.5.4

10.3 Effects on water quality and the Water Framework Directive requirements (including potential creation of a new water body).

10.3.1 The Project will enhance water quality in the Bay, especially taking into consideration the extension to the WWTW long sea outfall.

10.3.2 The requirements of the Water Framework Directive have been assessed and presented in an updated WFD Assessment, which will be submitted during the course of the examination. It is not considered that the Project will conflict with the requirements of the Directive.

10.4 Given the aspiration to undertake construction works 24/7, the impacts arising from aspects of the construction noise upon local communities and the environment.

10.4.1 The Project is not predicted to have any significant effect on receptors as a result of the generation of night time noise[163] due to the distance from residential and other receptors, the proposed timing of noise-generating activities and the nature of the surrounding levels of existing noise at the operational Port.

[163] ES Chapter 19 paragraphs 19.5.1.11, 19.5.1.15, 19.5.2.4, 19.5.2.11, 19.5.2.16, 19.5.2.20

10.5 The impacts arising from the construction of the development (alone and in combination with developments such as Swansea University Bay Campus; SA1 Development and Coed Darcy Urban Village and marine projects) upon the local community (including nearby industrial/commercial/university areas) in terms of lorry movements, noise, dust and vibration during the construction phases.

10.5.1 Traffic generated by the schemes cumulatively assessed in Section 15.7.4 of the ES conclude that daily traffic flows on Fabian Way will increase by up to 16%, while traffic on Kings Road will be increased by 36%. This represents an adverse impact of moderate significance, subject to mitigation measures. Those measures specific to HGV movements include: close control of on-site vehicles; the "just-in-time" principle to govern deliveries to site; planning of access and egress to site to avoid impact on the surrounding highways and local road users. All measures will be secured through the CPTMP, which will be agreed with CCSC prior to commencement of construction.

10.5.2 Paragraphs 16.7.0.3 and 16.7.0.4 of Chapter 16 of the ES confirm that there is no significant effect arising from particulate dust or emissions on any of the surrounding receptors when assessed in-combination with the identified projects. Table 19.34 in Chapter 19 of the ES shows that in-combination and cumulative impacts related to vibration and noise were not considered relevant in relation to the developments considered.

10.6 The impact of electro-magnetic fields including human receptors offshore.

10.6.1 The placing of the cable within the seawall will not have any effects on human receptors offshore. In response to concerns raised by Public Health England in respect of effects of EMF, the depth of the cable(s) comprising the grid connection has been increased by 100mm, where necessary, onshore.

10.7 Health related contamination impacts.

10.7.1 NPS EN-1 states that, for developments on previously-developed land, applicants should ensure that they have considered the risk posed by land contamination.[164]

10.7.2 The Project is not predicted to have any impacts related to land contamination[165]. Any impacts on construction workers related to the contamination of land will be of negligible significance[166], and managed through standard measures secured in the CEMP[167].

[164] NPS EN-1 paragraph 5.10.8

[165] ES Chapter 18 Table 18.11

[166] ES Chapter 18 paragraph 18.5.2.3

[167] ES Chapter 18 paragraph 18.5.3.3

10.8 Health impact assessment and health and safety of construction and operational personnel, offshore and onshore.

10.8.1 A Health and Safety Environmental Management Plan will be prepared and implemented by contractors and secured through the CEMP. This will govern the safety of construction of staff following best practice and standard guidance.

10.8.2 The safety of operational staff will be secured thought the OEMP.

10.9 Employment, skills and community benefits and impacts

10.9.1 Planning Policy Wales sets out that the Welsh Government seeks to support economic and employment growth alongside social and environmental considerations within the context of sustainable development.

10.9.2 The Project has been assessed to provide 1,850 full-time equivalent jobs during construction. This has been assessed as causing a major beneficial impact in the period of construction. The operation of the Project, including indirect and induced employment, is expected to be beneficial. This is increased in significance considering the socio-economic profile of the Bay area, which would benefit greatly from new opportunities. Further to this, TLSB has set out (at Appendix 2 and 3 of the Planning Statement, Document 8.2) its education and skills strategy that will be followed in the construction of the scheme. These commitments support and enhance the ongoing benefit for Swansea created as a result the establishment of a new industry for the production of tidal lagoons.

10.9.3 By TLSB's assessment some 122 Relevant Representations were made in support of the investment and/or jobs that the Project represents for Swansea Bay.

10.9.4 The Project will also have wider benefits as part of TLSB's commitment to sourcing 50% of the manufactured components from UK. Subject to further commercial agreements, TLSB has secured that 50.5% of the materials required for the manufacture of the turbines will come from the UK, creating significant demand for companies in Rugby and Sheffield. Further evidence can be provided to the examination upon conclusion of these agreements.

10.9.5 TLSB considers that the provision of public realm, boating, education and visitor facilities represent the significant community benefits provided by the Project. By TLSB's assessment, 65 Relevant Representations were made in support of the community benefits of the Project.

11 Landscape, seascape, visual impacts and design

11.1 Visual impact of the proposals (including buildings and lighting) and principles of good design.

11.1.1 NPS EN-1 states that the principles of good design "*should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible*"[168]. The policy recognises the limitations that may apply to energy schemes, and states that applicants should apply the principles as far as possible in so far as limiting the negative impact on the area.

11.1.2 Planning Policy Wales recognises the relationship between good design and the achievement of sustainability, stating that "*To create sustainable development, design must go beyond aesthetics and include the social, environmental and economic aspects of the development, including its construction, operation and management, and its relationship to its surroundings.*"[169]

11.1.3 In terms of visual impact, NPS EN-1 states that the decision-maker should consider whether visual impacts on sensitive receptors outweigh the benefits of the scheme. The policy recognises the particular sensitivity of undeveloped coast.

11.1.4 Within the constraints of an offshore energy generating station, the Project has been designed in line with principles of good design set out in NPS EN-1 and PPW. This process is set out in full in the Design and Access Statement submitted with the Application (doc ref 8.1). The site was chosen for a number of factors, not least its location in the context of an industrialised modified coastline. The accessible offshore elements have been designed to provide public realm akin to green infrastructure and the associated benefits this will bring to the local area. TLSB consulted with Design Commission for Wales throughout the pre-application process in order to ensure the implementation of good design principles (see Chapters 4, 5 and 8 of the Consultation Report), and the Commission is in broad support for the scheme. The proposed offshore and onshore buildings as well as the series of "marine parks" are examples that demonstrate how the integration of these principles into all elements of the Project has produced exemplary features that will be accessible to all and promote the aims of sustainable development.

11.1.5 The visual impact of the Project is predicted as neutral on the majority of the identified receptors in the Bay. For the area of Meridian Quay and Swansea University Bay Campus, immediately

[168] NPS EN-1 paragraph 4.5.1

[169] PPW 4.11.1

adjacent to the current inaccessible industrial foreshore, it is predicted that the Project will have a beneficial effect. Two receptors have been identified where the Project will have major adverse effects: in the area adjacent to Mumbles Pier, and in Crymlyn Burrows SSSI.[170]

11.1.6 The need for the Project and its associated benefits in the provision of renewable energy, as set out in these written representations, and throughout the Application documents, outweighs the visual impact on these receptors. In most cases, the provision of public realm and opening up of previously inaccessible foreshore serves to lessen any impacts associated with the presence of the structure.

11.1.7 Further to this, TLSB submits that the Project has been designed to enhance its visual impact by making a strength of (and indeed celebrating) the rise and fall of the tides and the Lagoon's seascape setting. This is demonstrated through the commitment to the provision of public art that will be integrated into the Lagoon's structure, the employment of high quality design of the integral buildings, and the high priority given to the design of the public realm. From the Project's inception, the principle of providing a structure that becomes a piece of architectural and structural heritage to the Bay, that would meet the aspirations of the best examples of architecture, landscape and planning, has been as imperative as the generation of renewable energy.

[170] ES Chapter 13 Table 13.22

11.2 How the detailed design of the proposed buildings and structures will be determined and approved given the limits of deviation proposed. The adequacy of DCO provisions for the detailed design.

11.2.1 As noted at section 3.1 above, draft requirements 4 and 5 of the DCO provide for the detailed design of the authorised development. The requirements state that the Project must be carried out in accordance with the Planning Drawings submitted with the Application (doc ref 2.4), which are scheduled within draft requirement 5, and with the general principles of the Design and Access Statement (doc ref 8.1). The works comprising the authorised development are shown on the submitted Works Plans (doc ref 2.2), which will be certified after the making of the DCO under article 46.

11.2.2 The Works Plans as submitted show the relevant limits of deviation for each specified work. The limits of deviation provided for in the DCO are specific to each element of the Project, and are included as the most appropriate required for each type of work. Upper limits of deviation are as specified at Part 2 of Schedule 1 to the DCO.

11.2.3 The Examining Authority can be confident that the parameters of the authorised development, both physically, and in terms of design and appearance are both adequately delineated within the drafting of the DCO and sufficiently flexible to allow for appropriate detailed design..

12 Compulsory powers

12.1 Whether acquisition of the land is necessary, whether alternatives have been considered and whether there is a compelling case in the public interest (s122) for the acquisition of identified plots and compulsory powers over, and rights in, land, subject to any protective provisions.

12.1.1 The Project area is relatively constrained, particularly on its landward side. Consequently, the Project has already been engineered to ensure that reasonable alternatives to compulsory acquisition of larger areas can be avoided. Other alternatives to compulsory acquisition include negotiations with third parties. Such negotiations are ongoing with all affected landowners and stakeholders and protective measures are in the process of being negotiated.

12.1.2 A full discussion of the alternatives to compulsory acquisition in respect of the Project is included at Section 7E of the Statement of Reasons submitted with the Application (doc ref 3.1)

12.1.3 The Project is a generating station. This type of facility satisfies the function of contributing positively to the Government's recognised need for a diverse and secure energy supply, as set out in national policy (National Policy Statements EN-1 and EN-3), and, further, the Project will play a contributory role in helping to achieve security of energy supply in the UK.

12.1.4 There is an identified public benefit in meeting the energy challenge relating to the Project. This is expressed in greater detail in the Statement of Reasons as a compelling case in the public interest and can be seen in section 7G of that document.

12.2 Whether the interference in human rights of compulsory acquisition powers would be justified and proportionate.

12.2.1 TLSB has weighed the balance of the potential benefits wrought by the Project with any potential infringements of the European Convention on Human Rights caused by it, and considers that the inclusion of powers of compulsory acquisition would not constitute any unlawful interference with Convention rights and that it would be appropriate and proportionate to grant powers of compulsory acquisition. A more detailed exploration of these issues is included at Section 9 of the Statement of Reasons (doc ref 4.1).

12.2.2 Further, in light of the relatively low level use of areas of land affected by powers of compulsory acquisition, the balance between the right to peaceful enjoyment of property protected by the Human Rights Act 1998 is clearly made out. The High Court has found that compulsory acquisition in the public interest is proportionate, provided that the case for the compulsory purchase is made out. It has been held that the general requirement that there be a compelling case in the public interest to justify confirmation of compulsory purchase order will usually ensure that the requirements of the European Convention on Human Rights is met (see *Bexley LBC v Secretary of State for the Environment, Transport and the Regions [2001] EWHC Admin 323 at 46: Tesco Stores Limited v Secretary of State for Environment, Transport and the Regions (2000) P&CR 427 at 429*)

12.3 Special land: the need for any authorisations to acquire Crown Land (under s135), statutory undertakers land (s127) or to interfere with statutory undertakers' equipment (s138).

12.3.1 Crown land

12.3.2 As the Project is situated predominantly offshore, land included within the powers under the DCO contains certain areas of land, comprising seabed and foreshore, which are in the ownership of the Crown Estate.

12.3.3 Section 135 PA2008 states that an order granting development consent may include provision authorising the compulsory acquisition of an interest in Crown land if the Crown Estate consents to the acquisition. Article 51 is included in the draft DCO so as to address the need for the consent of the Crown Estate expressly under section 135 PA 2008. This has the effect that the consent of the Crown Estate Commissioners is still required for any works which are subsequently authorised.

12.3.4 TLSB has discussed the Project with the Crown Estate and is applying *via* the Crown Estate's leasing round announced on 8 July 2014 for the grant of an appropriate interest in the land held by the Crown Estate required to deliver the Project, and engagement in this respect is ongoing.

12.3.5 Statutory undertakers' land and apparatus

12.3.6 The land required for delivery of the Project, and consequently subject to powers of compulsory acquisition sought by TLSB under the DCO, includes that held by statutory undertakers (as defined at section 127 PA 2008). In addition, the relevant apparatus of certain statutory undertakers within the Project boundary (defined in section 138 PA2008) may be removed.

12.3.7 In each of these cases, TLSB is in ongoing with each affected statutory undertaker with a view to negotiating appropriate and satisfactory protective measures for each party. In addition, TLSB will make submissions to the Secretary of State for each relevant sector in respect of each statutory undertaker's interest and/or apparatus as appropriate pursuant to sections 127 and 138 (where applicable) PA2008.

12.4 Extent and detail of rights proposed to be acquired in land.

12.4.1 The extent of land required for the Project is addressed in the Statement of Reasons and in the Book of Reference that accompanied the Application.

12.5 Other compulsory powers proposed to be granted, including temporary possession/use of land, powers to override easements and rights over/under streets.

12.5.1 The following powers relating to the acquisition of land or interests, the carrying out of works and other rights are as outlined below.

12.5.2 The provisions of articles 9 to 12 of the draft DCO (doc ref 3.1), which relate to streets, are not compulsory acquisition powers. They are powers which relate to the carrying out of works to streets. In article 10(5) there is a provision, which enables a person who is disadvantaged by the suspension of a private right of way to claim for the effects of the Project. The provisions of articles 9 and 11 are not compulsory acquisition powers but are works powers.

12.5.3 Articles 14 and 15 are compulsory powers to interfere with rights over land. The right applies to buildings lying within the Order Limits in each case. .

12.5.4 Article 39 does enable works to trees and shrubs near to the authorised development or the order land. It is in the nature of a power giving rise to compensation determined under the 1961 Act. However, at such time as the works have been completed it will not be possible for the effects of this to be identified.

12.5.5 Therefore, only articles in the draft DCO which appear to give rise to the potential for compulsory acquisition are articles 10, 14, 15 and 39.