Beinn Mhor Power and Eishken 1989 Partnership

Screening Report for the Proposed Construction Berthing Facility at Eisgein

March 2012

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Edinburgh
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[redacted]

Screening Report

BEINN MHOR POWER AND EISHKEN 1989 PARTNERSHIP

Screening Report for the Proposed Construction Berthing Facility at Eisgein

For and on behalf of
Natural Capital Ltd

Approved by: [redacted]
Signed:

[redacted]

Position: Director

Date: 5.3.2012

Registered Office: Natural Capital Ltd, 3 Ormidale Terrace, Edinburgh, EH12 6DY. Registered in Scotland. No: 185394

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1 INTRODUCTION

1.1 PREAMBLE

Beinn Mhor Power and Eishken 1989 Partnership are developing proposals for a construction berthing facility on the Eisgein Estate, Isle of Lewis (National Grid Reference NB318109) for use during construction of the 39 turbines of the consented Muaitheabhal Windfarm. The windfarm was consented with conditions by Scottish Ministers in two parts: in January 2010 (33 turbines) and in December 2011 (six turbines). It is anticipated that construction of the windfarm may begin in autumn 2012. Beinn Mhor Power and the Partnership propose to make an application for the berthing works as soon as practical (see Section 1.3).

1.2 THE PROPOSALS

The location of the proposals, a small bay on the north shore of Loch Sealg, is shown on Figures 1.1 and 1.2 and the detail of the proposals in Figures 2.1 - 2.3. In summary they include a slipway ramp and conventional slipway which would enable landing craft and barges to unload (including a crane for lifting the turbines ashore); an 'A' frame fender berthing facility against which vessels delivering the turbines would berth; a crane hardstanding from where the crane would unload the turbines from the delivery vessels; a heavy storage and blade storage area; and an access track to the closest part of the windfarm site (near Turbine 25). The slipways could be used also during construction by boats bringing construction workers and some HGV traffic for the windfarm. They would also be used to service maintenance and decommissioning activities.

More details of the proposals are included in Section 2.4.

1.3 STATUTORY CONTEXT

The works would be located in an area which crosses over mean high water springs (MHWS) and mean low water springs (MLWS) (see Figures 1.2 and 2.1). It is therefore understood that consents under two planning regimes are required:

- a planning application under the Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006 (for works above MLWS); and
- a Marine Licence under the Marine (Scotland) Act 2010 (for works placing materials below MHWS).

The relevant corresponding Environmental Impact Assessment (EIA) Regulations are the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2011 (The EIA Regulations) and the Marine Works (EIA) Regulations 2007 and the Marine Works (EIA) (Amendment) Regulations 2011 (the Marine EIA Regulations). The requirements of these Regulations are described further in Section 1.4.

Land for the landward works is in the control of the Partnership. The area of seabed required for the facility would be leased from the Crown Estate by the Partnership.

1.4 SCREENING OF THE PROPOSALS

Proposals require environmental impact assessment (EIA) under the provisions of the EIA Regulations and Marine EIA Regulations if the scale of the proposals and the nature or location of the development indicate the potential for significant

effects. EIA is mandatory for proposals which fall within Schedule 1 of the EIA Regulations (or Annex 1 of the EIA Directive[1]). The proposals do not fall within this category because they are not for the type of development described in Section 8(2) of Schedule 1 of EIA Regulations which is:

8(2) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes

or Section 8(b) of Annex 1 of the Directive:

8(b) Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1,350 tonnes

The proposals are for construction of a fendered berthing facility to be used for a short period during construction of the windfarm, possibly occasionally to facilitate maintenance activities at the windfarm and during decommissioning of the windfarm at a later stage not a trading port or a traditional pier. It is not anticipated at this stage that many more than ten deliveries to the berth would be made during construction of the windfarm by vessels over 1,350 tonnes (see Section 2.4).

Schedule 2 development is development for which formal EIA is not mandatory but only required where there is potential for significant environmental effects. The proposed development does not specifically fall within the categories described in Schedule 2 of the Regulations or Annex 2 of the Directive relating to marine development (construction of harbours and port installations, including fishing harbours). Beinn Mhor Power and the Partnership however, wish to confirm their understanding of the requirements and request a Screening Opinion under the EIA Regulations from Comhairle nan Eilean Siar (the Council) and from Marine Scotland under the Marine EIA Regulations of whether the development is EIA development.

This report presents information required by the Regulations when requesting a Screening Opinion:

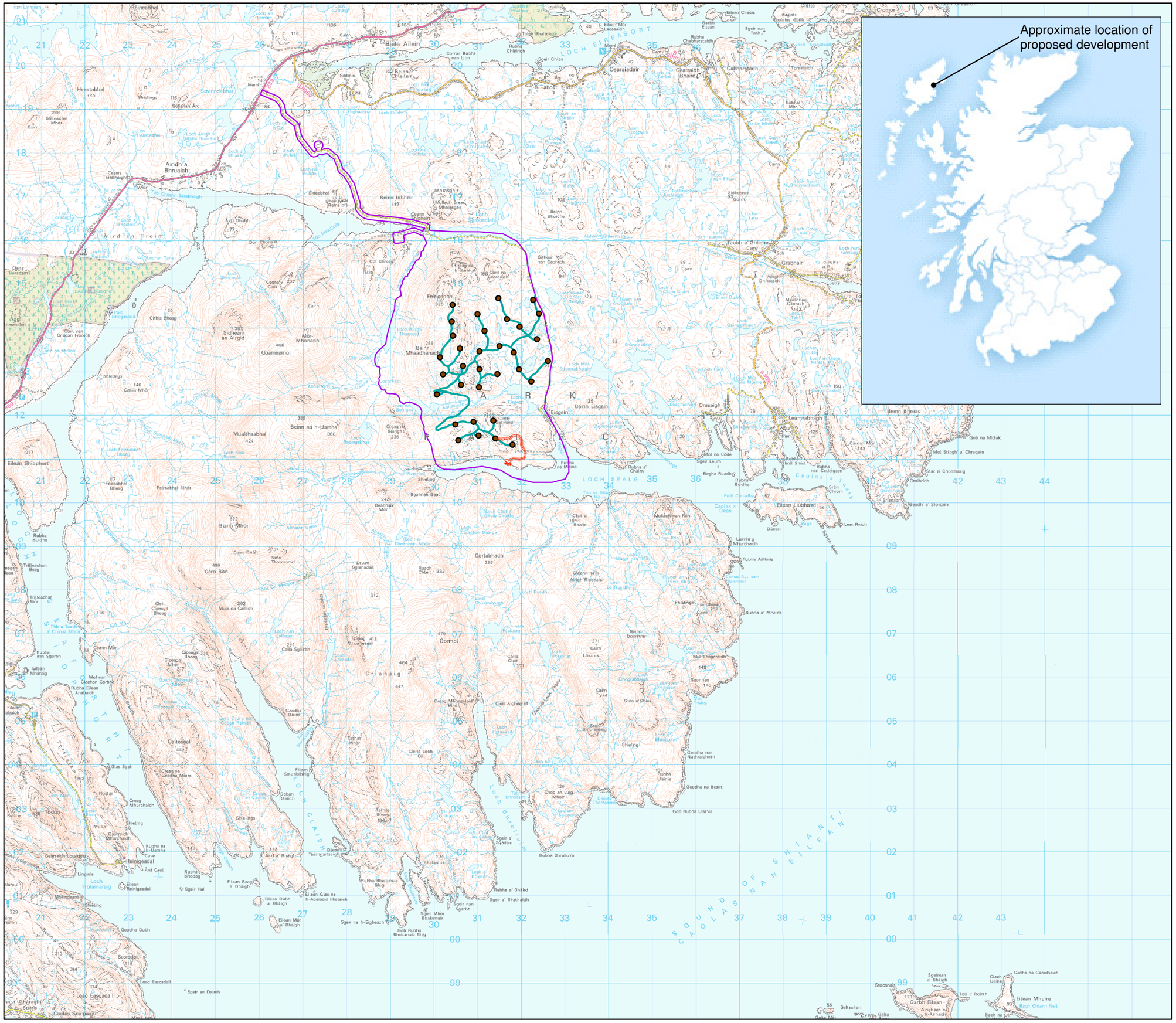
- a plan identifying the land to be used in the development (see Figure 1.2);
- a brief description of the nature and purpose of the development (Sections 1.1 and 1.2 and Chapter 2) and its possible effects on the environment (Chapter 3); and
- other information considered useful to the Council and Marine Scotland in considering the Screening request.

In collating the Screening Report reference has been made to the Scottish Government's Guidance on EIA Screening (2011) (see Appendix A).

The Council and Marine Scotland have confirmed their willingness for one report to cover the screening request to each organisation.

Work to date by the project team would suggest that the proposals would not have significant effects on the environment if robust committed mitigation measures were implemented (see Chapter 3).

[1] Council Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment (as amended). The wording in the Directive in 8(b) for Annex 1 projects is: Trading ports, piers for loading and unloading connected to land and outside ports (excluding ferry piers) which can take vessels of over 1350 tonnes



Key:

- Proposed Berthing Facility and Access Track
- Windfarm Site Boundary
- Turbine Locations
- Windfarm Site Access Track

N

0 1 2 3 4 Km

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Eisgein Construction Berthing Facility

Screening Report

Figure 1.1: Site Location

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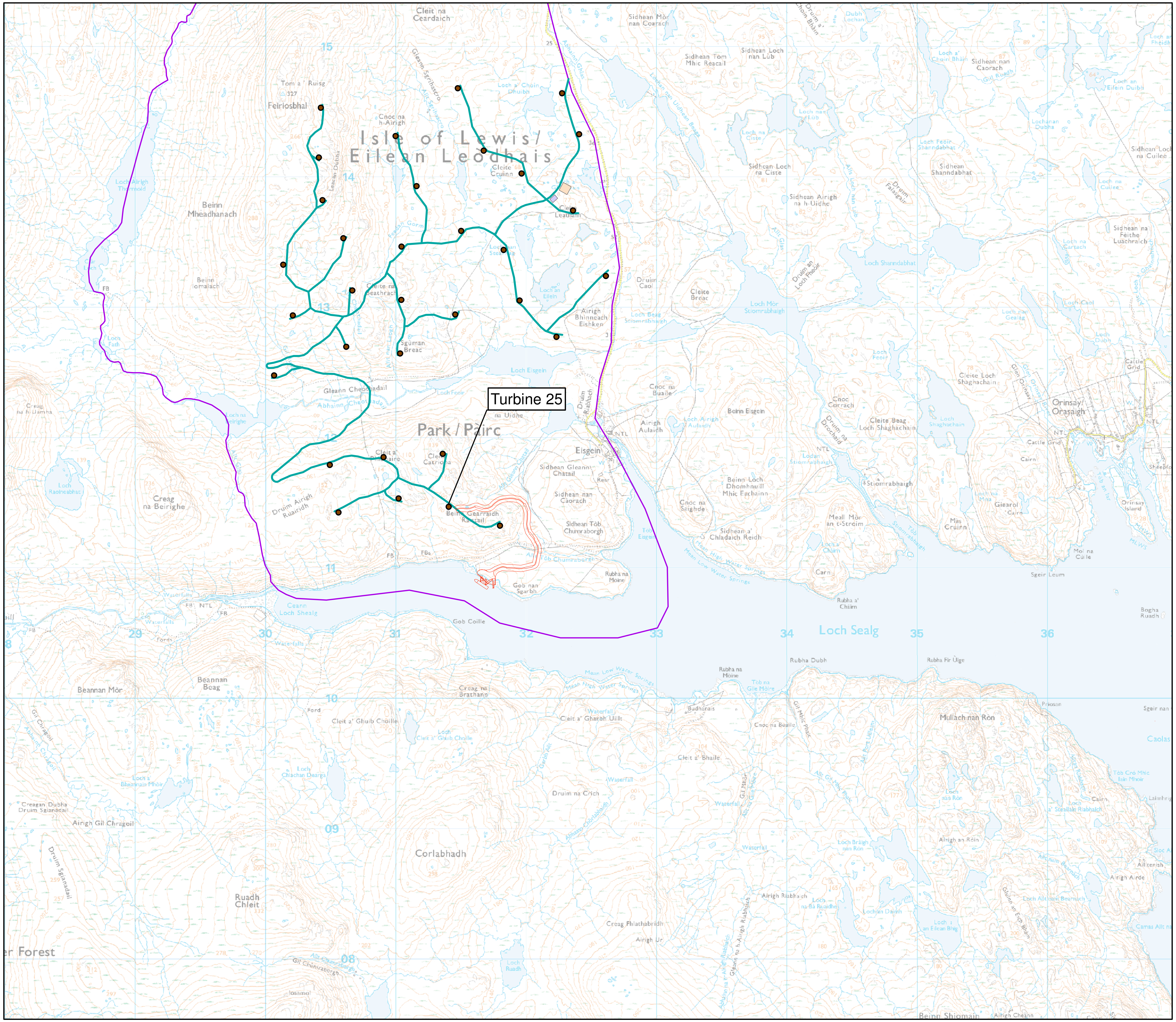

Key:

- Proposed Berthing Facility and Access Track
- Windfarm Site Boundary
- Turbine Locations
- Windfarm Site Access Track
- Windfarm Site Compound
- Substation

N

0 0.4 0.8 1.2 1.6 Km

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Eisgein Construction Berthing Facility

Screening Report

Figure 1.2: Site Layout

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1.5 PRE - APPLICATION CONSULTATION

The requirement for pre-application consultation (PAC) under The Planning etc (Scotland) Act 2006 has been considered. Pre-application consultation is required for national developments defined in the National Planning Framework and for major development as specified in the Town and Country Planning (Hierarchy of Development) (Scotland) Regulations 2009. The Hierarchy Regulations apply to all developments across Scotland, and to all land and water covered by the Planning Acts where the reference to waters is only relevant to marine fish farming[2]. The proposals at Eisgein fall in the category 'Other Development' in the Hierarchy Regulations where the relevant criterion is '*is the site area 2 or more hectares'*. The area of the proposed constructed works is 1.751 ha in total of which 1.75ha is above MLWS (that is, comes within Council planning control).

In parallel with this request for an EIA screening opinion a request for a PAC screening has been made to the Council.

1.6 SOURCES OF INFORMATION

The key sources of information used to inform this report are:

- information contained within the Muaitheabhal Windfarm Supplementary Environmental Information 4 Report and other supporting documents including relevant information undertaken for the original Muaitheabhal Windfarm (2004);
- desk based research including relevant web sites;
- Ordnance Survey (OS) mapping;
- discussions with statutory consultees (including the Council Planning Officer, Marine Scotland (Marine Licensing), SNH and SEPA);
- a walkover site visit in January 2012;
- a marine survey in February 2012 by WA Marine & Environment; and
- information from Beinn Mhor Power and the Partnership and other project team members including the marine design engineers Wallace Stone LLP (information about the marine works and the Loch Sealg) and the windfarm consultants for the project, Natural Power Consultants Ltd (including information about the access track design and the peat depths etc along the line).

1.7 METHODOLOGY

The methodology used to consider whether impacts on the environment could be significant has followed the principles of recognised EIA process where the potential for environmental impacts from the various parts of the proposals has been considered taking account of the sensitivity of the baseline and the opportunity for mitigation to prevent, reduce and, where possible offset any impacts which could either by themselves, or in combination with other impacts have a significant adverse effect. The significance of an effect results from the interaction between its magnitude (which is related to the extent of the physical change, its spatial extent, duration and frequency) and the value of the resource or the number and sensitivity of those people who might be affected. The potential for direct and indirect, adverse and beneficial, short-term and long-term, permanent and temporary effects has been considered taking account of mitigation measures which would be implemented. The definition of a significant effect which has been adopted is one which in isolation or in combination with

[2] Scottish Government Circular 5 2009 Hierarchy of Developments

others, is material[3] to the environment and therefore should be taken into account in the screening process.

It is considered that decommissioning impacts would be no greater than those during construction and use of the berthing structure and they have not been considered in the assessment. At the time of decommissioning a detailed plan and method statement for the works would be required to be agreed with the Council and relevant statutory agencies.

1.8 STRUCTURE OF THE REMAINDER OF THE REPORT

The remainder of the report is structured as follows:

- Chapter 2 describes the proposals;
- Chapter 3 sets out an initial appraisal of the environmental effects of the proposed development and mitigation proposals;
- Chapter 4 summarises the key findings of the work to date and makes recommendations on the way forward.

The report is supported by the following appendices:

- Appendix A: Screening Checklist
- Appendix B: Marine Survey Findings
- Appendix C: Gazetteer of Photographs (taken by the project team)

[3] i.e. important or having an important effect and of sufficient importance to take into account in development decisions

2 THE PROJECT

2.1 INTRODUCTION

This chapter explains why the proposals are being developed, describes the alternatives that have been considered and outlines the method of construction, what would happen at the end of the life of the proposals and how sound environmental management would be achieved on site.

2.2 PROJECT NEED

It is aimed to construct the Muaitheabhal Windfarm as efficiently and economically as practical with the least adverse impact on the community and environment as possible during construction. The advantages of delivery of the wind turbine components, and potentially the 132/33kV transformers, by sea direct to the site without use and significant upgrading of the Arnish Road, the A859 (which is the principal road from Stornoway to the Isle of Harris) and the minor road to the Eisgein Estate and the Muaitheabhal Windfarm to transport abnormal loads have been considered further by Beinn Mhor Power and the Partnership. This appraisal has found that there would be advantages and that development of detailed proposals for a berthing facility for use during construction would be of benefit to the windfarm project. Use of the facility would also reduce the environmental impact of major upgrading of the current consented windfarm access route which would be required for abnormal loads and of impacts on the community despite the costs of development of the facility.

2.3 ALTERNATIVES

Alternative locations for the berthing facility have been considered by the design engineers in the project team (Wallace Stone LLP). These included reconsideration of some of the options looked at during the EIA process for the windfarm and additional options:

- sea transport to a new berthing facility on Loch Erisort;
- sea transport to a new berthing facility on Loch Shiphoirt;
- road transport from Stornoway using the A859 and a new bridge crossing of Loch Shiphoirt; and
- various locations in Loch Sealg.

Options in Loch Sealg were found to offer the best opportunity for a development because they required least additional access track from the berthing facility to where the turbines were required; they avoided constraining the narrow Loch Shiphoirt and did not require any major new bridge as was required for one option on Loch Shiphoirt. It was found that a simple A frame fendered berthing facility could be accommodated in Loch Sealg with minimal intrusion. In addition Loch Sealg is currently used as an anchorage to shelter vessels in storm conditions in the Minch and this suggested that a suitable sheltered berth could be constructed.

The site chosen can be accessed from the land for investigations by an existing access track on the estate from Eisgein; access from the sea is good and the water depth at the berthing facility is sufficient for berthing needs of turbine delivery ships (some 8-10m at high water); the berthing site would be in close proximity to the closest turbines and consented access tracks (approximately 1300m) and it benefits from a relatively flat hinterland in which a laydown area

could be easily accommodated together with offering the potential to construct a track to the windfarm site at a preferred construction gradient.

2.4 DESCRIPTION OF THE PROJECT

2.4.1 Marine and Land-Based Works

The location of the proposals is shown on Figure 1.1 (see Section 1.2). The site is located at a small bay on the north shore of Loch Sealg and details of the proposals are shown in Figures 2.1 - 2.3.

In summary the proposals include construction of:

- a stepped ramp 50m long and 12m wide, with a horizontal end section and a berthing face 3m high at its outer end, to allow unloading of a 750 tonne mobile crane using a suitable barge;
- a conventional raised slipway 70m long and 8m wide adjoining the ramp, for use by landing craft and, alongside, personnel vessels;
- a fendered berth to accommodate turbine delivery vessels whilst being unloaded by crane. The berth is of minimalist design, consisting of two steel A frames supported at their outer ends by two steel columns founded on concrete blocks (2m x 3m x 1m high) on the sea bed. A heavy duty fender secured to each of the columns would create the contact points for the delivery vessel whilst alongside;
- a concrete retaining wall and two concrete thrust blocks supporting the inner ends of the A frames and supporting the infilled area on which the crane stance would be constructed;
- rock armour at the edges of the infilled area to either side of the retaining wall, to protect from erosion by wave action;
- six bollards for mooring the berthed vessel; two on the fender columns, two on the concrete thrust blocks and two on separate concrete anchor blocks;
- a storage area, including the crane hard standing, with areas for storing heavy components and turbine blades as they were offloaded from the delivery vessel; and
- temporary buildings, most likely two or three portacabins, for the duration of the unloading operations for office and welfare facilities etc.

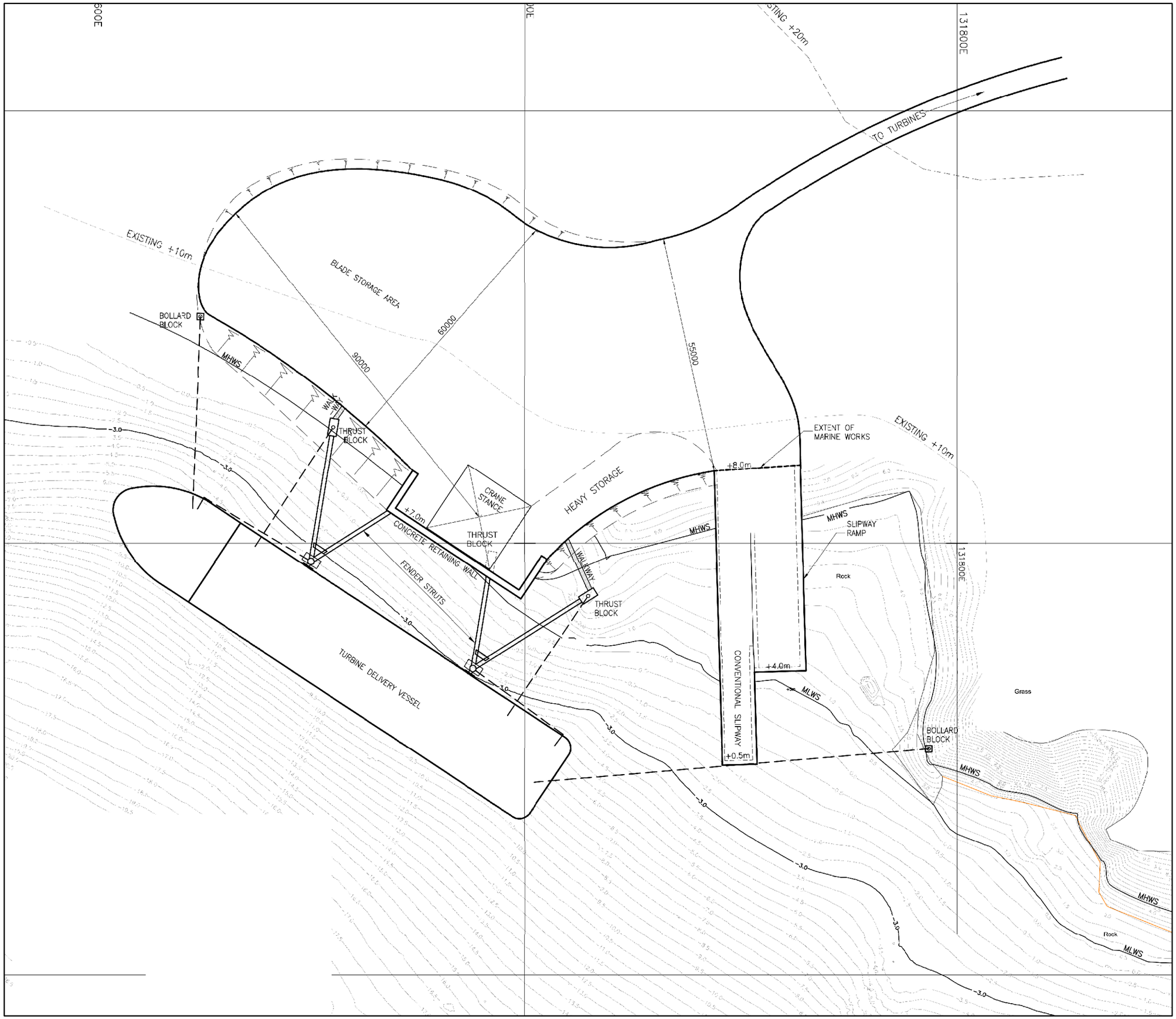
No dredging would be required as water depth is adequate for requirements.

No piling would be required. The two concrete columns would be lifted into place on the sea bed and their toes cast into concrete bases dowelled into the seabed rock. Divers would assist, in installing the dowels and the base concrete.

The stepped ramp would be required to enable a barge to berth with its deck level with the horizontal ramp end section, allowing the main mobile crane[4] to be driven off. The vehicle is approximately 20m long and cannot accommodate the sudden changes of gradient that are unavoidable when using landing craft at conventional slipways. The barge would also carry the support vehicles (assembly crane and trucks carrying ballast and jib sections etc).

The crane would be assembled at the dedicated crane stance and would be used to unload turbine components from delivery vessels arriving at the fendered berth. Following unloading of all large turbine components, the heavy main crane and its support vehicles would be re-loaded at a suitable tide level on to the barge and

[4] The main crane would have a capacity of approximately 1000 tonnes



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Eisgein Construction Berthing Facility

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Figure 2.1: Proposed Berthing Facility

WALLACE STONE

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Key:

- Proposed Berthing Facility and Access Track
- Access Track Buffer Zone
- Turbine Location
- Windfarm Site Access Track

N

0 0.075 0.15 0.225 0.3 Km

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Eisgein Construction Berthing Facility

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Figure 2.2: Site Access Track

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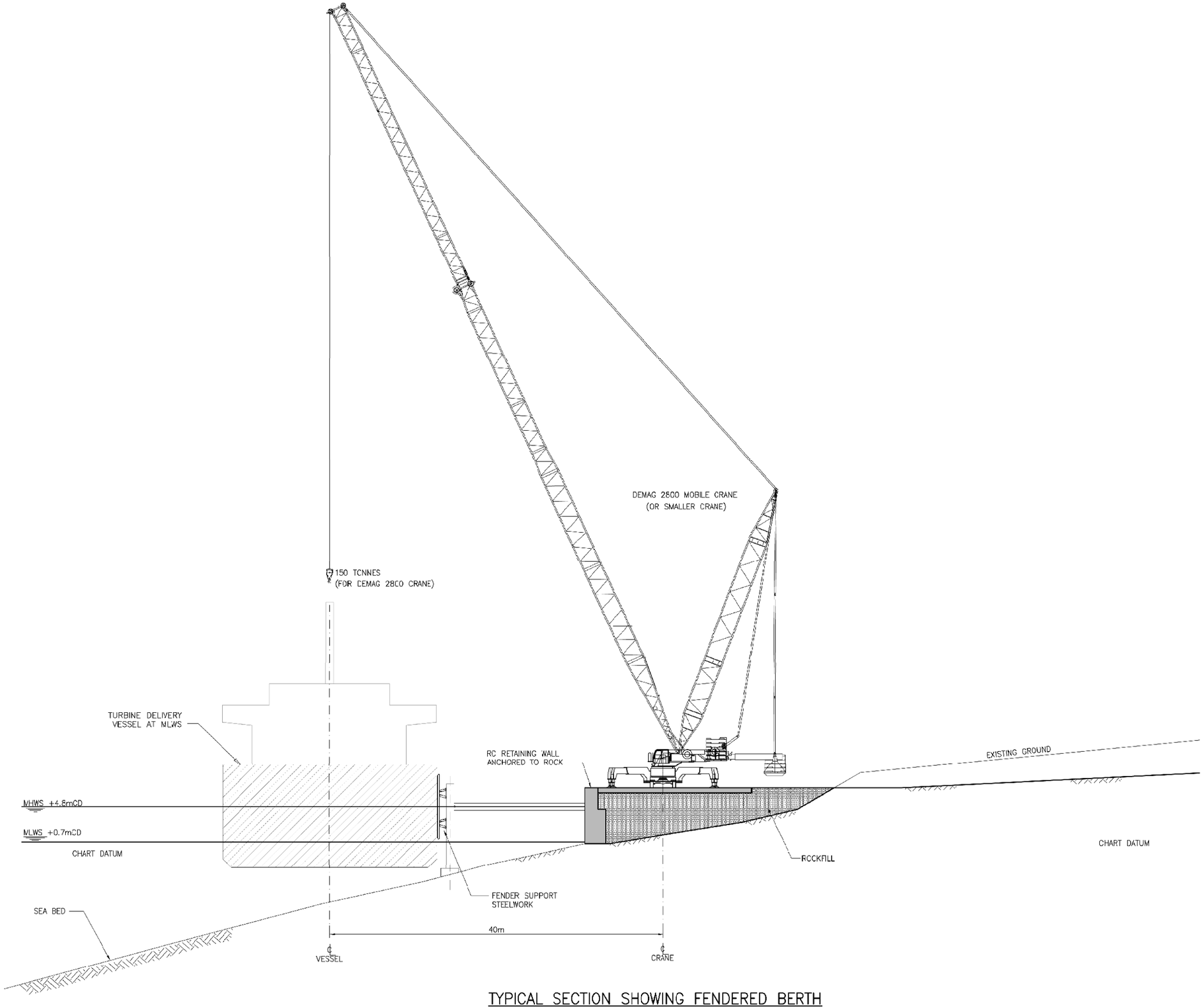

TYPICAL SECTION SHOWING FENDERED BERTH

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Eisgein Construction Berthing Facility

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Figure 2.3; Fendered Berth

WALLACE STONE

natural CAPITAL

removed from site. A second crane with a smaller lifting capacity (approximately 200 tonnes) than the main crane would also be used for some activities on the site.

The ramp would also allow any abnormal and HGV loads required during the construction phase to be delivered to site by barge. The conventional raised slipway would allow landing craft and personnel vessels to land at any time during construction and to support maintenance. Landing craft could readily offload normal road-going vehicles as required.

Figure 2.3 demonstrates how the main crane would be used. It would be sited on the crane pad immediately behind the concrete retaining wall and would lift turbine parts ashore from vessels moored at the berthing facility. It is anticipated that only a few deliveries by turbine delivery vessels to the fendered berth would be required to construct the windfarm (see Section 1.4).

The heavy storage area and blade storage area (see Figure 2.1) are required to store the turbine parts once they are unloaded until delivered to the windfarm site for construction. The storage area would be levelled as part of the works and surfaced with crushed rock. Once the major windfarm components had been delivered the storage areas could be restored over about one third of their area until further significant use during decommissioning.

The area of the proposals would be lit during the hours of construction but not permanently when works were complete. Power would be sourced from a temporary generator located in the works area. The berthing facility would be marked during the operational phase (until the structure was decommissioned) with solar or wind powered navigation lights to the approval of the Northern Lighthouse Board.

The main berthing facility has been designed primarily for use during construction of the windfarm and would only be needed when unloading turbines from delivery vessels. These vessels are likely to be over 6000 tonnes in size. It is not anticipated that the berthing facility would be required during routine maintenance operations because it would be too expensive to hire the crane for occasional deliveries and these would more likely be made by landing craft and barges using the slipway facilities. The berthing facility could be required to facilitate access for maintenance works requiring major components.

2.4.2 Access

Access to the site would be from the sea - Loch Sealg or from the existing estate access track until a new access track was constructed which would join the site to the windfarm access tracks (see Section 2.4.4 and Figure 2.2).

The new access track would be constructed from the north east corner of the storage area to the windfarm access track close to Turbine 25 (see Figures 2.1 and 2.2). The track would be some 1300m in length and would have at least a 5m wide running surface on straight sections and up to 7m width at bends with approximately 2m shoulders on either side that is up to a 9m wide footprint and the gradient would be limited to 1 in 16. Passing places would be provided (see Figure 2.2). The track would follow the line on the plan but it is proposed that it could be microsited to facilitate avoidance of environmental constraints if required or to maximise environmental benefits (for example, working round a rock outcrop rather than having to blast this etc). The overall footprint would not be increased.

The track would need to be capable of supporting heavy construction plant delivering the turbines to the windfarm site. The track would be constructed from stone fill with removal of the existing peat in most locations which would be stored for reuse in restoration of the sides of the track; any passing bays and restoration of the works site (see Section 2.4.7). Any rock which obstructed the track would be removed mechanically and (if required) by blasting. Floating road design may be used in some areas of deeper peat.

2.4.3 Work Programme

A 30 week construction period is estimated for the proposals which would start as soon as all necessary consents were in place and all detailed design complete. This (the start of construction) is estimated to be autumn 2012.

2.4.4 Construction Methods

The construction sequence in summary would be as follows:

- deliver excavator, dumper, huts and provisions to site by landing craft;
- remove boulders from slipway area and grade to even gradient;
- create level construction area at 'storage area';
- deliver self-contained welfare facilities;
- deliver concrete materials, batching plant and equipment by landing craft;
- construct concrete slipway, and access track to storage area;
- construct concrete retaining wall and abutments;
- excavate and store peat and soil;
- excavate rock to create level storage area, stockpiling excavated rock for re-use;
- construct drainage system to capture runoff from storage and crane areas, with oil interceptor;
- construct concrete thrust blocks and bollard bases, with steel dowels grouted into rock;
- using stockpiled rock, infill to edge of storage area and compact;
- using boulders from excavation stockpile, and, where necessary, imported rock pieces, armour slopes at edge of storage area;
- construct concrete base slab for crane;
- construct concrete walls of barge ramp;
- infill between walls with rock from stockpile;
- construct concrete slab to ramp;
- construct access track from ramp to connect to slipway access track;
- install temporary supports and erect steel A-frame struts connected to support brackets at retaining wall and thrust blocks;
- using divers, airlift soft material from area of fender column bases;
- install fender columns and connect to brackets at outer end of A-frame struts;
- using divers, install steel dowels grouted into rock, around bases of columns;
- using divers, install formwork around column toes, and construct concrete bases, securing columns to rock; and
- install fendering, bollards, safety ladders etc.

2.4.5 Required Resources

Concrete would be batched on site. Some 1500m^3 of stone required for the rock armour would be sourced from local quarries and brought to site by barge or trucks on landing craft. The fenders, steel frames and columns and other materials for the berthing facility would be brought to site by sea and could be brought ashore using landing craft or barges.

It is likely that some stone required for the access track from the berthing facility to Turbine 25 (see Section 2.4.2) would be sourced from the consented borrow pits on the windfarm site.

Crushed rock to surface the laydown areas would be sourced locally and brought to site by landing craft or barge.

2.4.6 Employment

Construction of the berthing facility would create some 15 jobs for a period of approximately 30 weeks. There would also be indirect benefits from construction (supply of materials etc) and induced benefits from spend by those working on the project. This would be additional employment benefits to those which have been described for the windfarm. No specific jobs relating to the marine facility would be created in the period after construction although the slipways would be used for maintenance activities for the windfarm. The contractor would be encouraged to use local labour and source materials from the Western Isles wherever possible.

2.4.7 Site Restoration

As part of the construction contract there would be a requirement for the works to be constructed with due regard to the environment. Works on the coast would be well finished and tied in to the natural coastline in as unobtrusive manner as possible. The permanent edges of the laydown area would be designed and implemented as naturally as possible avoiding engineered slopes where possible and benching rock faces where practical. It is expected that the storage areas would be reduced in size once the main windfarm construction period was complete (see Section 2.4.1). The areas no longer required would be carefully restored and landscaped mimicking adjacent areas in landform shape and habitat using stored materials (peat and turfs).

The sides of the access track would be carefully restored (see Section 2.4.2) reusing peat and turfs to ensure best fit with adjacent landform and habitat. Any boulders uncovered would be incorporated in the works to naturalise the new works.

Once the new facility had served its main purpose during construction of the windfarm the construction area would be left tidy and all redundant materials removed and disposed of to appropriate licensed facilities or reused in other works.

2.4.8 End of Life Plan

The design life of the Muaitheabhal Windfarm is 25 years. At the end of this period necessary permissions for its continued use would be obtained or the site would be decommissioned. The berthing structure would be used to facilitate the removal of turbines from the windfarm site using a heavy crane. Once these activities were complete the berthing structure and all associated works including the laydown areas and access track would be removed and the site restored.

2.4.9 Environmental Management

All environmental risks and necessary protection measures (including committed mitigation measures) would be required to be identified and integrated in the contractor's method statements for all construction activities.

The contractor would be required to establish and maintain effective liaison with other users of Loch Sealg throughout construction and use of the berthing facility. This would include information about the ongoing activities and provision of contact telephone numbers to contact the site for information during operational hours. An information board could be provided. A person would be identified with appropriate authority to resolve any problems. A log of complaints and actions taken to remedy these would be available for inspection.

The contractor would be required to ensure disturbance to the local community including other users of Loch Sealg from activities is minimised to that required for safe implementation of the works.

A Natural and Cultural Heritage Regeneration Plan is being developed for implementation over the Eisgein Estate as part of the mitigation package for the windfarm. This plan would encompass the area of these proposals. The environmental manager for the construction of the windfarm would also have responsibility for ensuring sound environmental management during construction and use of the berthing facility.

The contractor would be required to develop and implement a Construction Environmental Management Plan (CEMP) for construction following best practice[5]. This would be in addition to any more generic environmental management system (EMS) such as ISO 14001[6] which the contractor works under. The CEMP would set out procedures to ensure all activities with potential to affect the environment were appropriately managed. All environmental risks and necessary protection measures (including mitigation measures set out in this Screening Report) would be required to be identified and integrated in the contractor's method statements for all major construction activities. The CEMP would demonstrate how all topic specific and locational specific mitigation would be delivered.

All site staff would receive appropriate environmental training at the beginning of the contract and throughout the construction period as required. The contractor's compliance with environmental procedures would be audited on site at regular intervals during the construction works by the ecological clerk of works.

[5] For example IEMA (2008) Environmental Management Plans (Practioner Series)
[6] ISO 14001 is an international standard for environmental management

3 POTENTIAL ENVIRONMENTAL EFFECTS OF THE PROPOSALS

3.1 INTRODUCTION

This chapter sets out an initial appraisal of the likely effects of the proposals using information which is known at this time. A summary of the sources of information which have been used, a description of the baseline, potential impacts, opportunities for mitigation and a review of the potential for significant effects are provided for each environmental topic. Figure 3.1 illustrates the environmental constraints in the locality of the site. A summary of the findings is provided in Chapter 4 and Appendix A using a framework from the Scottish Government's Guidance on EIA Screening (see Section 1.4).

3.2 PLANNING CONTEXT

3.2.1 Sources of Information

Sources of information relevant to an initial assessment of compliance with relevant policy include:

- the statutory Development Plan[7] for the area currently comprising:
    - The Western Isles Structure Plan approved 2003; and
    - The Western Isles Local Plan (adopted June 2008);
- Scottish Planning Policy (SPP) Scottish Government February 2010; and
- relevant Planning Advice Notes (PANs).

3.2.2 Policy Framework

An initial review of policy and plans relevant to the area of the proposals indicates that the site is not zoned for any particular development or protected by any specific policy in the Development Plan other than those relevant to all development. Policies in the Development Plan and consultation draft Local Development Plan seek to protect natural and cultural heritage interests.

Scottish Government policy promotes sustainable economic growth contributing to the Government objectives and national outcomes while protecting and enhancing the natural and built environment.

3.2.3 Compliance with Policy

An initial appraisal of the proposals against relevant policy indicates general compliance provided all works are undertaken in accordance with best environmental practice and carefully detailed to best integrate with the surrounding landform and protect the natural environment.

[7] In line with Government requirements Comhairle nan Eilean Siar is reviewing the current Development Plan and is in the process of replacing it with a single Local Development Plan (LDP). The LDP will include a strategic vision and spatial strategy for the area and will provide the local interpretation of national planning guidance. The Local Development Plan – Proposed Plan was approved for public consultation between September and November 2011. The Western Isles Structure Plan and Local Plan remain the area's statutory Development Plan until the new Local Development Plan is adopted

3.3 LAND USE

3.3.1 Baseline

The berthing facility and associated works would be sited on the northern shore of Loch Sealg (~NGR NB318109) in a small rocky bay (see Photograph 1[8]). There are no properties in close proximity to the site or on the south shore of the loch. The closest settlement is Eisgein which is under the same ownership as land for the proposals. Eisgein is a small group of properties and estate buildings at the head of the inlet, Tob Eisgein, approximately 1.5km north east of the site (see Figure 1.1).

There is a salmon fish farm on the south shore of Loch Sealg approximately 2km south east of Eisgein located offshore of a small headland. There is no trawling in the loch but two boats use the loch for creeling (including lobster, crab and langoustines). Some recreational craft use the loch from time to time.

The land onshore which would be developed is predominantly moorland (wet heath and modified bog) which has been grazed by stock and deer. There is an existing track from Eisgein to a point north of the site (see Figure 1.2). Between the track and the shore there is a gentle slope which the access to the windfarm would follow in which various drainage grips have been dug in the past[9] (see Photograph 2).

It is understood that the area is not well visited but may be visited by occasional walkers.

A minor road (single track with passing places for the main part) links Eisgein with the A859 Stornoway to Tarbert road.

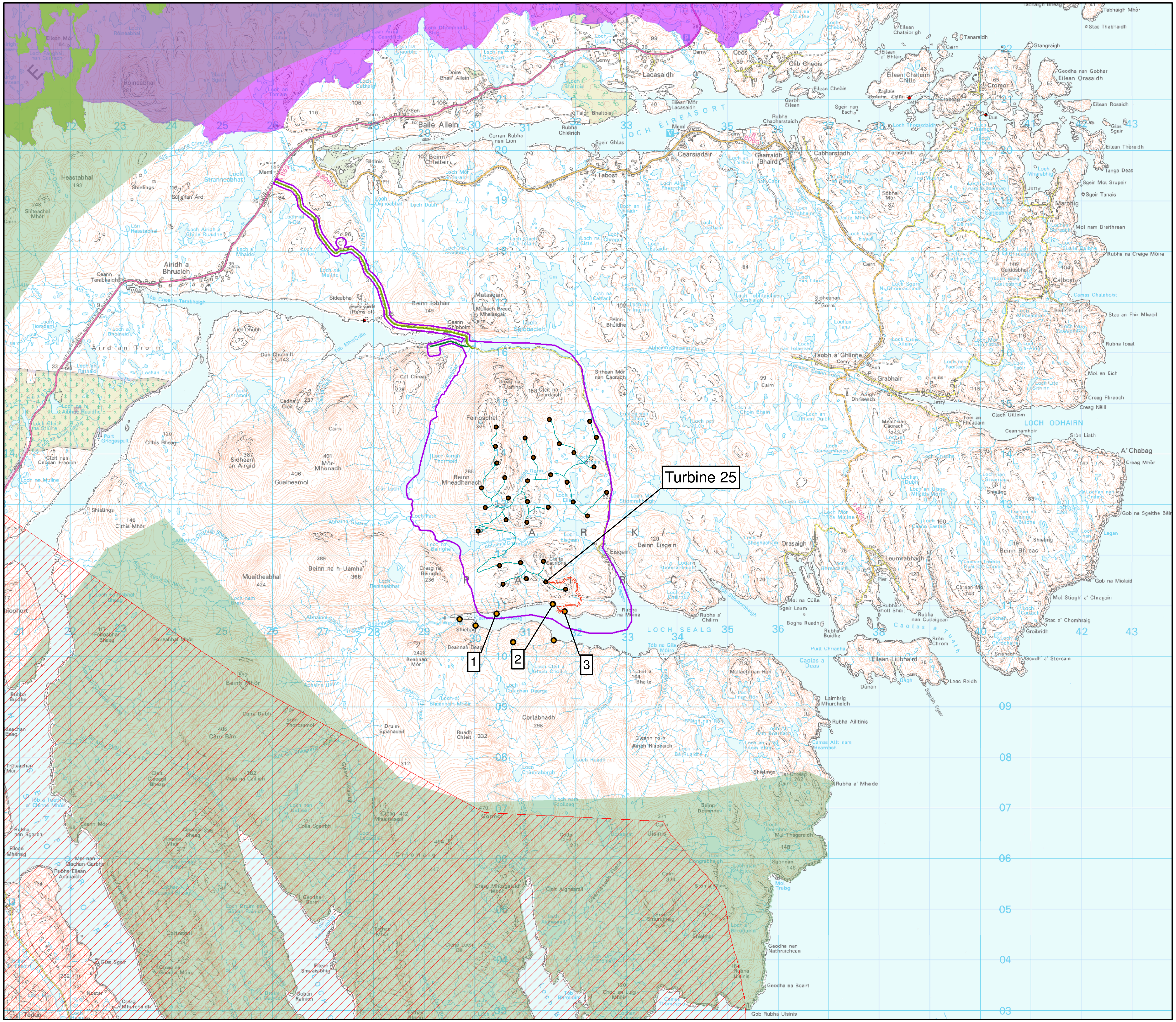
3.3.2 Potential Impacts

- Permanent change in land use for the area of the proposals;
- direct and indirect impacts on properties and current land uses (onshore and offshore);
- incompatibility of new land uses with existing land uses;
- increased hazards to marine traffic from construction activities;
- interruptions to recreational access on the land; and
- benefits to the community in reducing construction traffic on local roads used to access the windfarm.

3.3.3 Mitigation

- The land take for the proposals would be kept to the minimum necessary for safe construction of the works.
- The fendered berth would be used in construction but remain in place for any future major maintenance or for use in decommissioning the windfarm.
- The contractor would maintain regular dialogue with the fish farm and the creel fishermen to ensure they were well informed about likely activities and any potential hazards during construction and/or use of the new facilities.
- Access to the fish farm would be unaffected during construction.
- All construction works in the marine environment would be adequately marked and lit.

[8] All photograph references are to photographs in Appendix C
[9] A previous landowner had considered forest planting in this area



Key:

- Proposed Berthing Facility and Access Track
- Windfarm Site Boundary
- Turbine Location
- Windfarm Site Access Track
- Windfarm Site Compound
- Substation
- National Scenic Area
- SNH Search Area for Wildland
- SAC
- SPA
- Scheduled Monument (area)
- Scheduled Monument (point)
- Archaeological Site (SSMR)
- Eisgein Estate Road
- Existing Track
- 1 2 3 Archaeological site in proximity to proposals

N

0 1 2 3 4 Km

DRAWN: AG	CHECKED: AS	DATE: 05.03.2010

Eisgein Construction Berthing Facility

Screening Report

Figure 3.1: Site Constraints

natural CAPITAL

- Site hazards would be clearly marked as part of the construction site health and safety requirements and public access to the area whilst in use would not be allowed.
- At the end of construction the storage and laydown area would be reduced in size, partly returned to their former land use, and all portacabins and other redundant construction materials removed.

3.3.4 Potential for Significant Residual Effects

It is not considered that any significant adverse land use effects would result from the proposals. A total of 1.751ha of land would be taken for the development. The areas of land use change would be approximately:

- 0.151 hectares (ha) for the marine works of which 0.001ha is below MLWS;
- 0.76 ha for the landward works excluding the track; and
- 0.84ha for the access track from the site to the windfarm.

Impacts during construction of the facility and in operation could be controlled by implementing the mitigation measures set out in Section 3.3.3, by commitment to best site management practices and by the contractor establishing and maintaining good relationships with the current users of the loch.

There would be benefits to the local community in Lewis through significant reduction of heavy loads using the A859 to access the windfarm with turbine components delivered direct to site by sea from Europe or elsewhere rather than by road from Arnish. The road to Eisgein from the A859 would require some upgrade but less than that required to accommodate abnormal loads with consequential environmental benefits.

At the end of construction the site would be tidied and again following its use during construction of the windfarm. The berthing facility would be left in place for any required future use in connection solely with the windfarm.

3.4 GEOLOGY AND SOILS

3.4.1 Baseline

The site is not designated for its geological interests. Previous studies for the windfarm have indicated that the bedrock in the area is Lewisian gneiss and cataclastic gneiss. Superficial deposits include peat of various depths and small pockets of mineral soil and glacial drift.

The intertidal area is rocky with areas of boulders (see Photograph 3 and Section 3.7.1). Initial work by Wallace Stone has shown that the seabed is comprised of Lewisian gneiss bedrock overlain with gravel and boulders and occasional sand less than 1m in thickness. The foreshore is of the same bedrock with scattered stones and boulders.

The access track survey work has indicated variable peat depths of between none and up to 4m in some areas between the coast and Turbine 25.

3.4.2 Potential Impacts

- Removal of *in situ* materials;
- burial of sites and materials of geological interest;
- loss of valuable soils;

- physical damage of peat and soils;
- peat slip hazard;
- encountering contaminated land;
- pollution of soils and sediments from spills during construction or operation; and
- disturbance of sediments by vessels using the construction berthing facility.

3.4.3 Mitigation

- Rock won by engineering works required for the access track would be reused as stone for the track.
- Soils removed from the landward works would be re-used in restoration of the laydown area.
- The access track from the laydown area would be designed and aligned to ensure there was no potential hazard from peat slip.
- All fuel and other chemicals would be stored in accordance with best management practice during construction. All oil and fuel storage facilities and small static plant would be well managed to minimise the risks of leaks to soil and water.
- All earth bunds and soil storage areas would be well managed to minimise runoff and erosion.
- All visiting vessels would be required to comply with speed restrictions specified in the contract.
- If any contaminated ground was encountered this would be dealt with according to best practice and contained/treated or disposed of following best practice to a suitably licensed disposal facility.

3.4.4 Potential for Residual Significant Effects

The site is not within an area which is designated for its geological interests and no locally important geological features or exposures would be directly affected.

An access study completed by Natural Power for the windfarm project indicates that some engineering works would be required for the track to the windfarm which could include some removal of stone mechanically and, if necessary, using blasting. Any blasting would be undertaken out with the bird breeding season (see Section 3.7.3). Any removed material would be used to create the running surface of the track or in the hard standing of the laydown area.

The mitigation measures set out in Section 3.4.3 would control the risk of pollution on site and avoid unnecessary disturbance of sediments. It is not anticipated that any contaminated land would be encountered because the area has not been developed or knowingly used for any carcass disposal etc.

The access track has been designed to follow a minimum gradient from the laydown area, taking account of the risk for peat slide (see Section 2.4.2). The risk of peat slide would be mitigated by implementing best practice guidelines.

It is therefore not considered that any significant adverse effects on geology and soils would result from the proposals.

3.5 HYDROLOGY, WATER AND DRAINAGE

3.5.1 Baseline

The Allt Tob Chumraborgh flows west east parallel with the existing track from Eisgein and outflows to Tob Eisgein south of Eisgein (see Figure 1.2). A small burn flows into the inlet where the marine works would be sited in a south westerly direction from below the existing track from Eisgein (see Photograph 4). This has apparently formed from the confluence of a number drainage grips dug in the bog by a previous landowner (see Section 3.3.1 and Photograph 2). It is not shown on the OS 1:50,000 map.

There are no public water supplies in proximity to the site. The water supply for the properties at Eisgein is a spring above the Lodge. There are no discharges into the loch in proximity to the proposals. SEPA's indicative flood map[10] does not identify any of the area of the proposals at risk from flooding.

3.5.2 Potential Impacts

- Changes to surface water morphology;
- changes to the groundwater/hydrology of the area through physical works or dewatering during construction;
- increased flood risk in the surrounding area from the decrease in permeable area;
- pollution of terrestrial watercourses or the sea loch by run-off enriched with sediment;
- pollution from accidental spillages or discharges of fuels, oils, chemicals etc;
- pollution from the concrete batching plant; and
- impacts from discharge of sewage and effluent from site welfare facilities.

3.5.3 Mitigation

- The contractor would be required to consult with SEPA on all temporary and permanent pollution control measures.
- Drainage from the laydown area (during construction and permanently) would be dispersed through the crushed rock surface to a cut off ditch located behind the rock armour. An oil interceptor would be included in the detailed design.
- The contractor would be required to follow SEPA best management practice guidance (see www.sepa.org.uk).
- All requirements of the Water Environment (Controlled Activities) (Scotland) Regulations 2011 would be met.
- Appropriate measures would be implemented by the contractor to reduce the risk of particulate or chemical contamination from the site polluting the aquatic and marine environments during construction. These could include filters within drains (straw bales etc), strategically placed silt traps and lagoons particularly in any area identified by the ecological clerk of works.
- An oil interceptor would be included at the end of the outfall from the drain from the storage areas.
- No washing water from concrete batching plant or pipes would be discharged directly to the site drainage or the sea to prevent the risk of pollution from alkaline run-off. The contractor could be required to submit and agree any washing facilities with SEPA.

[10] http://www.sepa.org.uk/flooding/flood_map.aspx

- Equipment, materials and chemicals would not be stored within or near drainage ditches. All fuels, lubricants and chemicals would be stored within bunded and protected areas during construction of the proposals. Drip trays would be placed under standing machinery. All solid and waste materials would be disposed of in accordance with best practice to licensed facilities.
- All waste from welfare facilities would be contained in appropriate tanks and removed from site for disposal at suitably licensed facilities near Stornoway.
- An emergency response plan with effective spill response procedures (including spill kits etc) would be part of the procedures for site environmental management and actively managed and reviewed.

3.5.4 Potential for Residual Significant Effects

The new access track to the windfarm from the coast would require diversion of the modified burn which outfalls through the site to the east of the works. The track would also cross the Allt Tob Chumraborgh and a tributary of this (see Photograph 5). A culvert crossing would be constructed in accordance with recognised best practice[11]. If necessary, following discussion with SEPA, Controlled Activities Regulations (CAR) licences would be obtained for these works.

The construction of the access track would change local surface drainage patterns and could in some areas interrupt shallow groundwater flow. The track would be constructed with sufficient camber to minimise ponding on the surface which could increase the risk of sediment rich runoff into the surrounding environment. The track would have waterbars installed at regular intervals to divert longitudinal runoff into the track drainage system. Discharge of the water at regular intervals over vegetation from the access track ditch would ensure that changes to water levels in the surrounding bog and wet heath were reduced. The detailed drainage design (which would be agreed with SEPA) would include measures to attenuate runoff from the hill before discharge to the sea. These measures would reduce the risk of sediment runoff reaching watercourses or the sea.

The surface of the laydown area would be permeable and a cut off ditch would be included in the design and it is not considered that there would be any increased flood risk from the works on adjacent land. The detailed drainage system for the laydown area and the access track would be designed to ensure that any identified flood risk to storage of materials was mitigated. An oil interceptor would be included in the drainage design to ensure that any accidental spill could be contained before discharge to the sea.

Risk of pollution of the marine environment from drainage of landward works would be controlled by careful design of the works and implementation of best practice. No significant effects are predicted provided the mitigation measures are carefully implemented and their success audited. The batching plant would be located away from the water's edge and at a distance agreed with SEPA from the small burn. Water for the batching plant would be piped from the unnamed burn (with an extraction licence) or brought to site in a bowser. The contractor would be required to demonstrate as part of their environmental management plan how the risks to the aquatic environment from concrete would be controlled and these measures would be agreed with SEPA.

[11] River Crossings and Migratory Fish Design Guidance: A Consultation Paper Scottish Executive 2000

Provided all activities were carefully planned and mitigation measures detailed and implemented impacts on the aquatic environment could be controlled and would not be significant.

3.6 LANDSCAPE AND VISUAL EFFECTS

3.6.1 Baseline

There are no landscape designations covering the site. The South Lewis, Harris and North Uist National Scenic Area (NSA) is some 3.5km south of the site (see Figure 3.1). The site is not located in an SNH Search Area for Wild Land.

The site falls within an area classed as *Mountain Massif 1* in SNH's 1998 Western Isles Landscape Character Assessment. This type is characterised by '*individual peaks with pronounced summits, long ridges and slopes, rising steadily from the surrounding terrain. Steep sided corries and short U-shaped glens form an integral part of this character type and where the mountain massif meets the coast, the deeply indented coastline is dominated by rocky headlands, sea cliffs and occasional caves*'. In relation to the site the slopes are gentle with occasional rocky bluffs and a low cliff at the coast which is a rocky foreshore. There is a relatively flat platform above the shore before the land rises more steeply to the hills above (see Photographs 6 and 7). The surrounding landscape is rural and undeveloped, with extensive unenclosed moorland covered hills, with rocky outcrops used for low intensity grazing. There are no significant trees and only a small group of aspen at the coast (see Section 3.7.1) and the landscape is open south of the site with panoramic views to Loch Sealg and the hills beyond.

There are no properties on or in proximity to the site. The Lodge and properties at Eisgein are some 1.3km distant (see Section 3.3.1) and screened from the site by intervening topography. The site would be visible from Loch Sealg and from some of the hills around the loch.

3.6.2 Potential Impacts

- Displacement of existing landscape or seascape resources;
- creation of new landscape resources;
- change to the character of surrounding areas (land and sea);
- intrusion into views;
- installation of the contractor's compound and site office;
- installation and movement of construction machinery;
- intrusion from site operations and construction plant;
- intrusion from lighting for construction purposes;
- increased marine traffic movement in the loch;
- noise from activities at the site; and
- increased human activity.

3.6.3 Mitigation

- The rock armouring would be carefully curved so that it minimises the effects of erosion along the existing foreshore and blends with the natural environment.
- The rock armouring would be placed in a naturalistic way, with larger boulders being located at the toe of slopes, and a rough, irregular form.
- Any rocky knolls or natural features of the shoreline which would not interfere with the layout would be retained. The group of trees at the coast would be retained.

- Materials and machinery would be stored tidily during the works. Tall machinery such as the crane would not be left in place for longer than required for construction purposes, in order to minimise its impact in views.
- Lighting of compound and works site would be restricted to the minimum necessary for safe working and security.
- Local rock would be used to create the rock armouring. This would blend into the natural environment and weather in the same way as the existing rock, so that in time it would match in with the existing shore.
- On completion of construction, all remaining construction materials would be removed from the site.
- The parts of the laydown area not required for future maintenance activities would be carefully restored.

3.6.4 Potential for Residual Significant Effects

There would be no significant impacts on any sites designated for their landscape or visual importance. No trees or any other landscape features of particular importance would be displaced by the development. The group of aspen would be avoided. The presence on the coastline of the berthing structure would impact on the immediate local area but not on the wider landscape because the structure would be very low in the landscape (3m above high tide level) and the rock armour not unlike the rocky outcrop at the coast.

The works during construction would be visible to recreational users of the hills or loch particularly because the main crane would be very large but this would be very temporary and in the context of the major activities required to construct the windfarm very restricted in impact. There would be an increase in marine activity in the loch which would be seen also by those on the hills or using the loch and also from properties at the edge of Loch Sealg to the east but this would not be out of place with the fishing and fish farm activities already ongoing in the loch.

The mitigation measures which would be implemented would ensure that impacts were reduced to the minimum necessary for the works and that in the longer term the features which were introduced into the landscape would in time integrate with the surroundings (as the disturbed areas recovered and the rock armour became seaweed covered etc).

3.7 TERRESTRIAL AND MARINE ECOLOGY

3.7.1 Baseline

Designations

There are no sites designated for their nature conservation interest within proximity of the site. The closest designated sites are:

- the Lewis Peatlands SAC, SPA, Ramsar Site and SSSI (11km to the north of the site) designated for blanket bog and internationally and nationally important breeding birds - red-throated diver, black-throated diver, golden eagle, merlin, golden plover, dunlin, and greenshank; and
- the North Harris SAC, SPA, Ramsar Site and SSSI (10km south west of the site) designated for oceanic North Atlantic wet heaths with *Erica tetralix*, other important habitats, otter, salmon, freshwater pearl mussel and breeding golden eagle.

Terrestrial
Habitats on the site include areas of wet dwarf shrub heath and modified blanket bog (modified due to drainage grips) similar to those in the wider area. There are very small areas of grassland at the coastal edge where peat is absent. No plant species of particular nature conservation value are known from the site. At the west of the site at the cliff edge there is a small group of *Populus tremula* (aspen) (see Photograph 8).

Birds
A bird survey undertaken for the windfarm EIA recorded black-throated diver, golden eagle, merlin, greenshank, golden plover and dunlin from the area of the site. Golden plover were found breeding at the south of the site west of the new access track. The EIA found that implementation of measures to be detailed in a Natural and Cultural Heritage Regeneration Plan (see Section 2.4.9) would reduce most impacts on these species as a result of the windfarm to minor (not significant).

Otter
Otter surveys carried out for the windfarm found 12 shelters (holts and couches) along Loch Sealg indicating the shoreline and loch are important for otter. Evidence of otter was found in the walkover survey in January 2012 as tracks and a possible shelter (flooded at the time). Otter is a species of European importance protected under the Wildlife and Countryside Act, 1981 (as amended) and the Conservation (Natural Habitats etc.) Regulations 1994.

Marine
A summary of the marine dive survey is included as Appendix B. The littoral[12] survey identified a low energy, littoral rocky shore zonation typical for the area, with boulders, cobbles and pebbles covered with a canopy of fucoids (wracks) occurring in distinct zones up the shore (see Photograph 9 and Appendix B). The sublittoral survey indicated no areas of particular value with habitats generally in poor condition and a generally sparse flora and fauna. Outwith the construction site the lower circalittoral zone[13] (17.0-26.6m below chart datum (bcd)) comprised an expansive plain of cohesive mud that was bioturbated by burrowing megafauna with a conspicuous population of seapens, predominantly *Pennatula phosphorea (*phosphorescent seapen) (see Photograph 10). This biotope is on the list of Priority Marine Features[14] for Scottish territorial waters.

Data were collected for the windfarm ES from the Sea Mammal Research Unit (SMRU), the Sea Watch Foundation and various literature sources. Loch Sealg is used by cetaceans and in particular harbour porpoise and minke whale and also by grey and harbour seals. All cetacean species in Scotland are protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) as European protected species. Under the provisions of the Marine (Scotland) Act 2010 it has become an offence to kill, injure or take a seal at any time of year except to alleviate suffering unless a licence has been granted.

[12] The littoral zone extends from the splash zone, above the high water mark to extreme low water, where the shore is rarely uncovered. The sublittoral zone starts immediately below the littoral zone and is permanently covered with seawater
[13] The circalittoral zone is the region beyond the infralittoral (usually characterised by kelp) that is dominated by animals and lacks any kelp
[14] Priority Marine Features (PMFs) are habitats and species which SNH consider to be of greatest marine nature conservation importance in Scottish territorial waters. The draft PMF list contains 53 habitats and species and will be used to guide future research and support the advice SNH gives on marine biodiversity

3.7.2 Potential Impacts

- Loss of habitat or species through construction of the works;
- alterations to drainage regimes which may affect adjacent habitats;
- disturbance to or displacement of wildlife in proximity to the site through construction activities including noise and vibration from construction activities and increased boat movements;
- effects from increases in suspended solids in the sea adjacent to the site from construction operations which could result in smothering of communities;
- disturbance or damage to adjacent habitat not required for the proposals through construction activities (movements of vehicles or personnel, artificial lighting, dust, spillage of fuels and chemicals, emissions and noise);
- damage or disturbance to habitats or species adjacent to the proposals through operational activities;
- effects on wildlife from changes in night time lighting conditions;
- increased sedimentation along the foreshore resulting from changes in currents and wave conditions;
- creation of new habitats and introduction of species as a result of the works; and
- introduction of alien species through marine activity.

3.7.3 Mitigation

- Landtake would be restricted on land and in the marine environment to that required for safe construction of the works.
- In developing the detailed design and construction methods for the works the contractor would be required to minimise the loss of sublittoral habitat loss.
- Geotextile would be used to reduce the washout from fill material behind the rock armour.
- Any land degraded by construction would be restored after construction was completed.
- Habitat to be removed would be checked for breeding birds before removal if this is programmed within the bird nesting season. Wherever possible vegetation would be removed out with this period. If this was unavoidable and breeding birds were identified appropriate mitigation measures would be agreed with SNH and implemented.
- Any blasting (if required) would be undertaken outwith the bird breeding season.
- Requirements for licences because of the potential of the works to disturb protected species would be discussed and agreed with Marine Scotland and SNH. At present it is considered that an otter licence could be required.
- A detailed otter survey would be undertaken in advance of construction to identify the detailed mitigation measures required for a licence application to disturb otter, a species of European importance.
- A watch for cetaceans would be undertaken by a competent surveyor (for example, the ecological clerk of works) for a period before a noisy operation was to begin and if any animals are seen, the start of the operation would be delayed until they had left the area and there was no further detection for 20 minutes.

- The area free of marine mammals would be no smaller than 500m radius from the works and the contractor would follow JNCC guidance[15] on minimising the risk of disturbance and injury to marine mammals.
- Method statements would be drawn up by the contractor for those activities which could affect the marine environment and would be agreed with SEPA and SNH to ensure all necessary pollution prevention measures were included within them.
- The contractor would be required to demonstrate how impacts on the marine environment during construction would be minimised as part of each relevant plan in the CEMP and each construction method statement.
- Best site management practices would be implemented on site to minimise the risk of intrusion into adjacent habitats and the risk of pollution incidents which could affect neighbouring habitats.
- Appropriate measures would be implemented by the contractor to reduce the risk of particulate or chemical contamination from the site polluting the aquatic and marine environments during construction.
- The contractor would follow best practice on site including relevant SEPA pollution prevention guidelines (see www.sepa.org.uk).
- The contractor would be required to undertake daily qualitative checks for suspended solids in the water near the working site to check that best management practices were being implemented to reduce the level of sediment to that necessary for the job.
- Detailed contingency plans would be developed by the contractor for implementation in case of spillage during construction.
- Any wastes generated by marine traffic during construction (and in operation) would be handled and disposed of in accordance with current legislation and best practice.
- Excess construction materials and rubbish would not be dumped at sea.
- No area below high water mark would be used for the storage of any materials.
- Concrete additives would be added to all concrete placed underwater to eliminate separation and release of cementitious material into the water.
- A seabed survey would be undertaken at the end of construction and any remaining visible debris removed.
- Any physical effects to the foreshore would be made good where practical at the end of construction.
- The rock armour would be placed so as to encourage wildlife.
- Any surface water features affected by the proposals would be made good.

3.7.4 Potential for Residual Significant Effects

Loss of habitats on land and in the marine environment would be limited to that necessary for safe implementation of the works.

No habitats of particular nature conservation value have been identified on site and the loss of 0.15ha (of which 0.001ha is below MLWS) of habitat which is widespread in the area is not considered to be significant. Once the laydown area was no longer required a large part of it (approximately one third of the area) would be restored (see Section 2.4.7).

[15] JNCC (2009) Annex B – Statutory nature conservation agency protocol for minimizing the risk of disturbance and injury to marine mammals from piling noise, 2009 http://www.jncc.gov.uk/pdf/Piling Protocol June 2009.pdf. There would be no piling but this guidance is helpful in identifying appropriate measures to reduce the risk of impacts to marine mammals. Any further up to date guidance would also be used

Habitat removal would be programmed for outwith the bird breeding season. If this was unavoidable habitat to be removed on land would be checked for breeding birds in advance if this was to happen during the bird breeding season and if any signs were identified appropriate mitigation implemented.

Any blasting required for the works (see Section 3.4.4) would be programmed outwith the bird breeding season.

There would be a permanent habitat loss from the seabed of 0.15ha (0.001ha below MLWS) from the footprint of the marine works however no sensitive marine species have been identified in this area and so this is not considered to be a significant impact. Best management practices would be implemented to ensure that habitat loss is restricted to the minimum necessary for safe construction of the works. The marine survey identified an important biotope outwith the area of the works (see Section 3.7.1 and Appendix B). The survey indicated that it was not a classic example of a seapen and burrowed mud community with only occasional *Nephrops norwegicus* (Dublin Bay prawn), frequent *Pennatula phosphorea* (phosphorescent seapen) and rare *Virgularia mirabilis* (slender sea pen). It can be assumed that the habitat is quite extensive, but also a significant distance away from the proposed development. It is a biotope thought to be affected by organic enrichment[16], but unlikely to be affected by moderate inorganic siltation and with careful mitigation the Eisgein proposals should have no major effect on it.

There may be some disturbance to wildlife during construction and when the berthing structure and slipways are operational. This would be mitigated by the contractor being required to implement best management practices on site to reduce impacts from noise, dust, light and runoff pollution. The contractor would be required to work within the site boundary and to be aware of the potential of the works to disturb the wildlife interests in the area.

Otter interests have been identified within the site and thus it will be necessary to undertake further survey and apply for a licence to disturb otter from SNH. Elsewhere it has been found that otter etc can be resilient to construction activities and the effects have not been significant. The rock armour is likely to be used by otter in the longer term once it has become 'naturalised'.

It is considered unlikely that the proposals would disturb cetaceans or seals significantly because the scale of the works would be small (no piling or dredging would be required - see Section 2.4.1 and works would be completed in a few weeks). However a watch for cetaceans would be undertaken by a competent surveyor for a period before a noisy operation on site was to begin and if any animals were seen, the start of the operation would be delayed until they had left the area and there was no further detection for 20 minutes (or as agreed with Marine Scotland and SNH). The need for a licence would be discussed and agreed with Marine Scotland and SNH.

It is not considered that the structures at the shore would affect the rocky shore adjacent to the works in any significant way. The shore is relatively sheltered from wave action with only a small run up the loch. The risk of washout from fill material behind the rock armour would be reduced by the use of geotextile.

[16] Hughes, D. J., 1998. Sea pens and burrowing megafauna. An overview of dynamics and sensitivity characteristics for conservation management of marine SACs. Prepared for Scottish Association for Marine Science (SAMS)

The vessels delivering turbines would arrive fully laden and would not have to dump ballast water on arrival. Water would have to be taken on before departure from the loch. It is likely that fewer than ten deliveries would be required over a very limited period during construction of the windfarm (see Section 2.4.1).

In summary provided all mitigation is successfully implemented no significant effects on nature conservation are predicted.

3.8 ARCHAEOLOGY AND CULTURAL HERITAGE

3.8.1 Baseline

Work undertaken for the windfarm EIA indicates there are no scheduled monuments or listed buildings in proximity to the site or within a distance where their setting could be affected. There are three archaeological records in proximity to the proposals. These are detailed in Table 3.1 and shown on Figure 3.1. Site No 3 is on the site of the proposals. Sites 1 and 2 are located west of the site.

Table 3.1 Recorded Archaeological Sites on or in Proximity to the Site

Name	Site Type	Description	Reference Number	NGR	Distance/ Direction from the Site
1.Airigh Ruairidh	Shieling huts, possible	Three unroofed buildings marked as ruins that may be shieling-huts, shown on 1st edition map, but not seen on current edition	NB31SW14	130400910900	1.3km west
2.Gearraidh Raistail	Building	Unroofed building marked as ruin sitting just below the High Tide Mark shown on 1st edition OS map but not seen on current edition	NB31SW20	131500911050	270m north west
3.Gearraidh Raistail	Buildings	Two unroofed buildings marked as ruins lying just below High Tide Mark shown on 1st edition OS map but not seen on current edition	NB31SW15	131730910900	At the site

An initial check from the sea during the marine dive survey (see Section 3.7.1) found no evidence of marine wrecks or maritime cultural heritage in proximity to the site. There was no evidence of Sites 1 and 3. Site 2 was found to be an old pier and slip with, possibly, a shieling at the top but would not be affected by the works.

3.8.2 Potential Impacts

- Direct impacts to known or as yet undiscovered sites of archaeological or cultural heritage significance; and

- indirect effects to the settings of sites of archaeological and cultural heritage significance.

3.8.3 Mitigation

- A watching brief would be implemented during soil stripping.
- The contractor would be required to report any finds during the works including during earthworks and if any evidence of historical artefacts was found to ensure an appropriate mitigation strategy was agreed with the Council archaeologist and implemented.
- It is thought unlikely that there are any undiscovered wrecks or other maritime archaeology in the vicinity of the works however the contractor would be required to identify a mitigation strategy for the maritime cultural heritage resource prior to the commencement of the works which would be implemented if any items of interest were uncovered.

3.8.4 Potential for Residual Significant Effects

It appears unlikely that the seaward works could affect any known archaeological interest. The proposals would not affect the setting of any nationally important monument. The works in the sea would be low and not visible from a distance. The laydown area and track would be carefully restored and would be seen in the context of a major windfarm.

The features recorded on and in proximity to the site indicate the area has been used in the past and other remains could be found. A watching brief would be implemented during soil stripping and during the marine works to ensure any artefacts were recorded.

3.9 NOISE AND VIBRATION

3.9.1 Baseline

The baseline noise survey for the windfarm indicated noise levels at Eisgein varied with wind speed with levels of about 30dB(A) at lower wind speeds and frequent levels of approximately 40dB(A) although this level was partly influenced by running water in vicinity to the measuring location.

3.9.2 Potential Impacts

- The impact of construction noise and vibration on people inhabiting and using the area and on wildlife;
- the impact of changes in noise levels arising as a result of increased transportation movements associated with the proposed development (waterborne vessels and road traffic) on noise-sensitive receptors; and
- the impact of noise associated with use of the new facilities on noise-sensitive receptors such as other users of the area and wildlife.

3.9.3 Mitigation

- All relevant legal and best practice guidance would be followed including:

    a. the various requirements of EC Directives and UK Statutory Instruments that limit noise emissions of a variety of construction plant;
    b. guidance set out in BS 5228: Part 1: 1997, which covers noise control on construction sites; and

c. the powers that exist for local authorities under Sections 60 and 61 of the Control of Pollution Act 1974 to control environmental noise on construction sites.

- Best practice procedures for construction would be implemented on site.
- All site staff would be briefed on the importance of managing noise on site.
- Delivery vehicles would be prohibited from waiting within the site with their engines running.
- All construction plant would be properly maintained and operated according to manufacturers' recommendations, in such a manner as to avoid causing excessive noise.
- Checks for cetaceans and seals would be made in the loch before any noisy activities commenced. If any were found to be close to the works area before a noisy operation was to begin, the start of the operation would be delayed until they had left the area.

3.9.4 Potential for Residual Significant Effects

There would be some potential for noise during construction. Experience elsewhere has indicated that mitigation as set out above does reduce the impacts from construction activities quite considerably[17]. There are no properties in close proximity to the site (see Section 3.3.1) which would be affected by noise at the berthing facility or in the laydown area. A new breakwater has recently been constructed in Fetlar in Shetland and the mitigation measures which were implemented have been shown to control noise impacts on marine wildlife successfully.

The number of marine craft in Loch Sealg would increase over the period of construction of the berthing facility (some 30 weeks) during its use when turbines were unloaded and at the slipways during construction and maintenance of the windfarm (see Section 2.4). Residents at properties on the northern shore of the outer part of Loch Sealg are likely to be accustomed to noise from vessels in the loch. Marine craft accessing the site would pass by the south side of Eilean Liubhaird (see Figure 3.1) and it is not considered that the impacts on residents at local properties would be significant. Apart from use of the slipways to service maintenance activities impacts would be short term and temporary. Noise impacts from heavy goods vehicles on properties in proximity to the A859 would be substantially reduced (compared with the alternative windfarm construction option bringing turbines in by road) because the turbines would be delivered by sea. Impacts from maintenance activities would be much reduced compared to those during the period when the windfarm was under construction.

There would be some 400 heavy goods vehicle movements carrying the turbine components delivered at the berthing facility to the windfarm site for use in construction using the new access track. Impacts would be short term (over some six to nine months). The closest properties are at Eisgein some 1.5km distant and screened by undulating topography and impacts on people would therefore not be significant. Impacts on birds and other wildlife are considered in Section 3.7.4.

In summary there could be some noise impacts during construction from construction activities and from construction traffic but provided mitigation was implemented and the contractor maintained a responsible attitude to reducing

[17] Experience from other sites has shown that by implementing the above measures, typical noise levels from construction works can be reduced by approximately 5 to 10 dB(A)

noise, the impacts of these could be controlled and no significant residual noise effects would be predicted.

3.10 AIR QUALITY

3.10.1 Baseline

Air quality in the area of the proposals is good. There are no major sources of air pollutants near the site. There is no industrial development and no road traffic (see Section 3.3.1). Marine traffic in the loch is also low.

3.10.2 Potential Impacts

- Dust emissions during construction of the proposals;
- emissions from construction and operational traffic including emissions from boats at the fendered berth and slipway; and
- changes in predicted traffic movements on local roads.

3.10.3 Mitigation

- Best management practices would be implemented to control dust during construction particularly at the laydown area.
- Boats and vehicles would not be allowed to leave engines running unnecessarily.

3.10.4 Potential for Residual Significant Effects

Construction activities can lead to dust being created particularly in dry weather. This has the potential to affect habitats in the vicinity of the site. The contactor would be required to implement best management practices to ensure the risk of significant impacts was controlled and would be required to keep the site in a tidy condition. Turfs would be placed on top of storage piles of peat where practical to reduce the potential for erosion of the stored materials in dry conditions.

Air quality impacts from vessels used to deliver the turbines and from other construction marine traffic are not considered likely because whilst marine traffic movements would increase, road traffic movements would reduce compared with those predicted for construction of the windfarm. Any impacts even though small would be temporary (see Section 2.4) and are not predicted to be significant.

4 SUMMARY OF FINDINGS AND RECOMMENDATIONS

4.1 INTRODUCTION

This chapter summarises the findings of the initial appraisal of environmental effects from the proposals and makes recommendations for the way forward. Appendix A presents a summary of the findings using the Scottish Government's Guidance on EIA Screening framework (see Section 1.4).

4.2 KEY FINDINGS

- The Beinn Mhor Power and the Eishken 1989 Partnership are seeking permissions to construct a construction berthing facility on Loch Sealg for use during the construction of the consented Muaitheabhal Windfarm to facilitate delivery of the windfarm components by sea and avoid using the A859 for abnormal loads.
- A planning application under the Town and Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006 (for works above MLWS) and an application for a Marine Licence under the Marine (Scotland) Act 2010 (for works placing materials below MHWS) will be made.
- The proposals are to construct a slipway ramp and conventional slipway which would enable landing craft and barges to unload (including a crane for lifting the turbines ashore); an 'A' frame fender berthing facility against which vessels delivering the turbines (and possibly transformers) would berth; a crane hardstanding from where the crane would unload the turbines from the delivery vessels; a heavy storage and blade storage area; and an access track to the closest part of the windfarm site. The slipways could be used also during construction by boats bringing construction workers and some HGV traffic for the windfarm.
- The marine facilities would also be used to service maintenance and decommissioning activities. No other use of the construction fender berth is proposed. At the end of decommissioning works the facility would be removed.
- An initial review of relevant policies indicates the proposals are in compliance.
- The use of the berthing structure would provide local community benefits by reducing heavy goods vehicle traffic on the A859. No significant adverse land use impacts have been identified.
- No significant effects on geology or soils are predicted. Peat removed on site would be re-used in restoration works. The access track has been designed to avoid the risk of peat slide.
- The contractor would be required to implement best practice measures during construction to reduce the risk of pollution of watercourses and the marine environment. Environmental management procedures have been set out which would ensure that these were delivered.
- No areas designated for their natural or cultural heritage would be directly affected and no significant indirect effects have been identified.
- The proposals are not in a location which would be seen by many people. Construction activities would be evident to users of the neighbouring hills or from Loch Sealg but these impacts would be controlled and short term. The fendered berthing facility would be low in the water and would not be easily visible apart from when used by vessels to unload the turbines. Increased marine activity would be evident to those in the area including properties on the shore of Loch Sealg to the east. These would not be out

of place and would not be significant. All works would be carefully finished to ensure best fit with the surrounding landscape and seascape.

- The works would impact on an area of 1.751ha. There would be a permanent habitat loss from the seabed of 0.15ha on the foreshore and 0.001ha from the seabed below MLWS from the footprint of the marine works however no sensitive marine species have been identified in this area and so this is not considered to be a significant impact. No habitats of particular nature conservation value have been identified on the landward part of the site and the loss of 1.6ha of habitat which is widespread in the area is not considered to be significant.
- There may be some disturbance to wildlife during construction. This would be mitigated by the contractor being required to implement best management practices on site to reduce impacts from noise, dust, and light and run-off pollution and measures to protect cetaceans and seals.
- A licence could be required to disturb otter because of their use of the area.
- It appears unlikely that the works could affect any known archaeological interests. The proposals would not affect the setting of any nationally important monument. Mitigation would be implemented to protect any undiscovered archaeological interests.
- There could be some noise impacts during construction from construction activities and from marine traffic when the facilities were in use but provided mitigation was implemented and the contractor maintained a responsible attitude to reducing noise these impacts could be controlled.
- Construction activities can lead to dust being created particularly in dry weather. This has the potential to affect nearby properties. However, the contactor would be required to implement best management practices to ensure the risk of significant impacts was controlled. Air quality impacts during operation are not considered likely to be significant because marine traffic movements to and from the works whilst more than at present in the loch would enable significant reduction in heavy goods vehicles accessing the site.
- Construction of the works would create some 15 jobs for a period of some 30 weeks. There would also be indirect benefits from the construction (supply of materials) and induced benefits from spend by those working on the construction. This would be additional employment benefits to those which have been described for the windfarm. The contractor would be encouraged to use local labour and source materials from the Western Isles wherever possible.

4.3 RECOMMENDATIONS

The initial appraisal of environmental effects from the proposals indicates that impacts could be controlled by implementation of robust mitigation and, hence, that the residual effects would not be significant.

It is recommended that if it is found that formal EIA is not required a CEMP is collated which firmly sets out all mitigation which would be implemented if the project is constructed (mitigation would require to be further detailed as the detailed design was completed).

Appendix A

Screening Checklist

EISGEIN BERTHING FACILITY SCREENING CHECKLIST

1. CHARACTERISTICS OF THE DEVELOPMENT	Yes/no Briefly describe
<u>(a) Size of the development</u>	
Will the development be out of scale with the existing environment?	No. The berthing facility would be low in the water and an access track not dissimilar to those on the Eisgein Estate. The laydown area would be reduced to the minimum required after initial use to unload the turbine components
Will it lead to further consequential development or works (e.g. new roads, extraction of aggregate, provision of new water supply, generation or transmission of power, increased housing and sewage disposal)?	No. The proposals would facilitate construction of a consented windfarm
<u>(b) Cumulation with other development</u>	
Are there potential cumulative impacts with other existing development or development not yet begun but for which planning permission exists?	Yes. Works for the consented Muaitheabhal and its Extension Windfarm could be ongoing
Should the application for this development be regarded as an integral part of a more substantial project? If so, can related developments which are subject to separate applications proceed independently?	The more substantial projects have already been consented and could proceed without the berthing facility proposals

(c) Use of natural resources	
Will construction or operation of the development use natural resources such as land, water, materials or energy, especially any resources which are non-renewable or in short supply? • land (especially undeveloped or agricultural land)? • water? • minerals? • aggregates? • forests and timber? • energy including electricity and fuels? • any other resources?	1.751 ha of land would be required (0.151ha in the marine environment of which 0.001ha is below MLWS and 1.6ha on land) Stone would be required for the track which would be sourced from the engineering works for the track and/or from a consented borrow pit on the windfarm site Some 1500m^3 of rock armour would be required adjacent to the berthing facility
(d) Production of waste	
Will the development produce wastes during construction or operation or decommissioning? • spoil, overburden or mine wastes? • municipal waste (household and/or commercial)? • hazardous or toxic wastes (including radioactive)? • other industrial process wastes? • surplus product? • sewage sludge or other sludges from effluent treatment? • construction or demolition wastes? • redundant machinery or equipment? • contaminated soils or other material? • agricultural wastes? • any other solid wastes? • liquid or solid wastes in suspension?	There would be no waste from the marine works All removed materials from the on land works would be reused in restoration of the site Wastes from site facilities would be contained in appropriate tanks and removed from site for disposal at suitably licensed facilities near Stornoway

(e) Pollution and nuisances	
Will the development release pollutants or any hazardous, toxic or noxious substances to air? Emissions from:- • combustion of fossil fuels from stationary or mobile sources? • production processes? • materials handling including storage or transport? • construction activities including plant & equipment? • dust or odours from handling of materials including construction materials, sewage & waste? • incineration of waste? • burning of waste in open air (e.g. slash material, construction debris)? • any other sources	No
Is there a potential risk from:- • leachates? • escape of wastes or other products/by-products that may constitute a contaminant in the environment?	No - apart from sediment rich runoff
Will the development cause noise and vibration or release of light, heat energy or electromagnetic radiation? • from operation of equipment e.g. engines, ventilation plant, crushers? • from industrial or similar processes? • from blasting or piling? • from construction or operational traffic? • from lighting or cooling systems? • from sources of electromagnetic radiation (effects on nearby sensitive equipment as well as people)? • from any other sources?	Yes No There could be the need for some blasting to facilitate construction of the access track No piling required There would be an increase in marine traffic No No No

<u>(f) Risk of accidents, having regard in particular to substances technologies used</u>	
Will there be a risk of accidents during construction or operation of the development which could have effects on people or the environment?	
• from explosions, spillages, fires etc from storage, handling, use or production of hazardous or toxic substances?	No
• from events beyond the limits of normal environmental protection e.g. failure of pollution control systems?	No - the success of the committed mitigation measures would be audited on site
• from any other causes?	No
• could the development be affected by natural disasters causing environmental damage (e.g. floods, earthquakes, landslip, etc)?	No – the works are being designed to avoid peat slip hazard
Will the development involve use, storage, transport, handling or production of substances or materials which could be harmful to people or the environment (flora, fauna, water supplies)?	
• use of hazardous or toxic substances ?	No
• potential changes in occurrence of disease or effect on disease carriers (e.g. insect or water borne diseases)?	No
• effect on welfare of people (e.g. change of living conditions)	No
• effects on vulnerable groups (e.g. the elderly)?	No
<u>Other characteristics: potential physical changes (topography, land use, changes in waterbodies etc) from construction, operation or decommissioning of the development</u>	
• permanent or temporary change in land use, landcover or topography including increases in intensity of land use?	Yes but land could be reinstated when works decommissioned
• clearance of existing land, vegetation & buildings?	Yes- primarily for laydown areas
• Peat land disturbance and/ or degredation leading to; carbon release, damage to habitats, affecting land stability or hydrology?	Yes – but in mainly modified bog and over restricted area
• creation of new land uses?	Yes but in keeping with the marine environment

• pre-construction investigations e.g. boreholes, soil testing?	As required
• construction or demolition works?	Yes-the berthing facility
• temporary sites or housing for construction workers?	Yes
• above ground buildings, structures or earthworks including linear structures, cut & fill or excavations?	Marine works and access track
• underground works including mining or tunnelling?	No
• reclamation works?	No
• dredging?	No
• coastal structures (seawalls, piers)?	Fendered berthing structure and slipways
• offshore structures?	No
• production and manufacturing processes?	No
• facilities for storage of goods or materials?	Yes – laydown areas
• facilities for treatment or disposal of solid wastes or liquid effluents?	No
• facilities for long term housing of operational workers?	No
• new road, rail or sea traffic during construction or operation?	Yes (sea traffic)
• new road, rail, air, waterborne or other transport infrastructure including new or altered routes and stations, ports, airports etc?	Yes-reduction in assumed road HGV movements for windfarm
• closure or diversion of existing transport routes or infrastructure leading to changes in traffic movements?	See above
• new or diverted transmission lines or pipelines?	No
• impounding, damming, culverting, realignment or other changes to the hydrology of watercourses or aquifers?	Yes – one small burn outflow would require realignment
• stream crossings	Yes
• abstraction or transfers of water from ground or surface waters?	Yes – possibly required for concrete batching with all necessary permissions
• changes in waterbodies or the land surface affecting drainage or run-off?	Minor changes-see above
• transport of personnel or materials for construction, operation or decommissioning?	Yes – slipway could be used
• long term dismantling or decommissioning or restoration works?	Yes – to facilitate decommissioning of the windfarm
• ongoing activity during decommissioning which could have an impact on the environment?	Yes – but less than construction
• influx of people to an area either temporarily or	Not known-could be local

permanently? • introduction of alien species? • loss of native species or genetic diversity? • any other changes?	 Possible but to be mitigated Yes – but limited impacts and no species of particular nature conservation value Possible loss of otter shelter – licence would be applied for
2. LOCATION OF THE DEVELOPMENT	
<u>(a) Existing land use</u>	
Are there existing land uses on or around the location which could be affected by the development, e.g. homes, gardens, other private property, industry, commerce, recreation, public open space, community facilities, agriculture, forestry, tourism, water catchments, functional floodplains, mining or quarrying?	No – grazing land and sea loch. All potential impacts would be mitigated e.g. impacts on the fish farm in Loch Sealg
Are there any areas on or around the location which are occupied by sensitive land uses e.g. hospitals, schools, places of worship, community facilities, which could be affected?	No
Is the development located in a previously undeveloped area where there will be loss of greenfield land?	Yes
<u>(b) Relative abundance, quality and regenerative capacity of natural resources in the area</u>	
Are there any areas on or around the location which contain important, high quality or scarce resources which could be affected by the development? • groundwater resources • surface waters • forestry • agriculture • fisheries • tourism • minerals	Yes – marine environment and moorland – typical of the area
<u>(c) Absorption capacity of the natural environment</u>	
Are there any areas on or around the location which are protected under international or national or local legislation for their ecological, landscape, cultural or other value, which could be affected by the development?	No

Are there any other areas on or around the location which are important or sensitive for reasons of their ecology • wetlands, watercourses or other waterbodies • the coastal zone • mountains, forests or woodlands • nature reserves and parks	Yes – peatlands and watercourses
Are there any areas on or around the location in which species and habitats of Local Biodiversity Action Plan importance are present?	Yes
Are there any areas on or around the location which are used by protected, important or sensitive species of fauna or flora e.g. for breeding, nesting, foraging, resting, overwintering, migration, which could be affected?	Yes - otter
Are there any inland, coastal, marine or underground waters on or around the location which could be affected?	Yes
Are there any groundwater source protection zones or areas that contribute to the recharge of groundwater resources?	No
Are there any areas or features of high landscape or scenic value on or around the location which could be affected?	Yes but minor changes
Are there any routes or facilities on or around the location which are used by the public for access to recreation or other facilities, which could be affected? Are there any transport routes on or around the location which are susceptible to congestion or which cause environmental problems, which could be affected?	No – only limited use of the hills for stalking and some walking and the coast for fishing
Is the development in a location where it is likely to be highly visible to many people?	No
Are there any areas or features of historic or cultural importance on or around the location which could be affected?	No
Are there any areas on or around the location which are already subject to pollution or environmental damage e.g. where existing legal environmental standards are exceeded, which could be affected?	No
Is the location of the development susceptible to earthquakes, subsidence, landslides, erosion, flooding or extreme or adverse climatic conditions e.g. temperature inversions, fogs, severe winds, which could cause the development to present environmental problems?	No

CHECKLIST OF CRITERIA FOR EVALUATING THE SIGNIFICANCE OF ENVIRONMENTAL EFFECTS

The checklist below is for use in conjunction with the Screening Checklist provided above. It is based on the third section (Characteristics of the Potential Impact) of the 'Selection Criteria for Screening Schedule 2 Development' in Schedule 3 to the EIA Regulations. It is designed to help in deciding whether EIA is required based on the characteristics of the likely impacts of the development.

The Screening Checklist provided a list of questions to help in identifying where there are potential interactions between a development and its proposed location. The checklist below is designed to help decide whether those interactions are likely to be significant.

The following questions can be asked for each 'Yes' answer in the Screening Checklist, and the conclusion and reasons noted against the relevant answer. The questions are designed so that a 'Yes' answer will generally point towards the need for EIA and a 'No' answer towards EIA not being required.

CHARACTERISTICS OF THE POTENTIAL IMPACT
(a) Extent of the impact
Will the effect extend over a large area? No
Will many people be affected? No
(b) Transboundary nature of the impact
Will there be any potential for transboundary impact? No (nb. Development which has a significant effect on the environment in another Member State is likely to be very rare. It is for the Scottish Ministers to consider whether there is likely to be such an effect in each case).

(c) Magnitude and complexity of the impact
Will there be a large change in environmental conditions? No
Will the effect be unusual in the area or particularly complex? No
Will many receptors other than people (fauna and flora, businesses, facilities) be affected? No
Will valuable or scarce features or resources be affected? Not significantly
Is there a risk that environmental standards will be breached? No
Is there a risk that protected sites, areas, features will be affected? No
(d) Probability of the impact
Is there a high probability of the effect occurring? Not significant effects with mitigation implemented
Is there a low probability of a potentially highly significant effect? No
(e) Duration, frequency and reversibility of the impact
Will the effect continue for a long time? No
Will the effect be permanent rather than temporary? Landuse change would be permanent (at least until decommissioning) but small area
Will the impact be continuous rather than intermittent? Change ongoing
If intermittent, will it be frequent rather than rare? n/a
Will the impact be irreversible? No
Will it be difficult to avoid or reduce or repair or compensate for the effect? No

Appendix B

Eisgein Baseline Benthic Survey

B1 INTRODUCTION

The Muaitheabhal windfarm in the Lochs area of east Lewis has secured consents for the wind turbines and access tracks within the area.

It is proposed to undertake all deliveries to site by sea, with a vessel berth, slipway and barge ramp, incorporating a stance for a large crane to unload the vessels. The crane would be delivered to the site by barge.

Consents are required from Marine Scotland for all construction below MHWS and from Planning for all construction above MLWS.

As part of the consents screening process, a littoral and sublittoral benthic survey was commissioned.

B2 METHODOLOGY

B2.1 SUBLITTORAL SURVEY

The sublittoral survey comprised six spot dives and two transects from approximately 20m below chart datum (bcd) running northeast to the proposed concrete fender piles.

Diving survey methods were based on techniques developed for use on the Marine Nature Conservation Review (MNCR) surveys (Hiscock, 1996) and carried out under HSE diving regulations. All dives were on SCUBA with compressed air. All dives followed 'The Diving at Work Regulations 1997' and the 'Approved Code of Practice for Scientific and Archaeological Diving Projects' (1998).

Six spot dives were carried out at the following locations:

- 58° 00'.342N, 6° 32'.619W (easterly proposed concrete fender pile)
- 58° 00'.354N, 6° 32'.656W (westerly proposed concrete fender pile)
- 58° 00'.293N, 6° 32'.672W (two dives in deeper water to southwest of berth)
- 58° 00'.339N, 6° 32'.636W (upper infralittoral and sublittoral fringe on the inside of the proposed concrete fender piles)
- 58° 00'.333N, 6° 32'.550W (base of proposed slipway)

In addition two transect dives were carried out:

- Commencing at 21m bcd, heading on a bearing shoreward of 60° towards the westerly proposed concrete fender pile
- Commencing at 21m bcd, heading on a bearing shoreward of 35° towards the easterly proposed concrete fender pile

For the spot dives, a shot line was placed in the centre of each site. A pair of divers descended the line and surveyed the area around the shot. Each dive pair recorded habitat features, biotopes (JNCC Marine Habitat Classification, version 04.05, Connor *et al*., 2004), depths, species present and abundance. Similarly, during the transect dives, each dive pair recorded habitat features, biotopes, depths, species present and abundance.

Standard MNCR recording forms, incorporating the species codings of Howson and Picton (1997) and the abundance scales of Hiscock (1996) were completed.

Any specimens difficult to identify *in situ* were collected for later identification and, if appropriate, preservation.

Underwater photographs of biotopes and conspicuous species were taken, using a housed Fuji S2 pro and Nikon D90 with lenses as appropriate.

B2.2 LITTORAL SURVEY

The littoral survey comprised the laying of two transect lines, from the supralittoral zone down to low water springs:

- Site 1 ran from the sublittoral fringe to the supralittoral where the proposed slipway and barge ramp would be constructed. 58° 00'.341N, 6° 32'.544W to 58° 00'.365N, 6° 32'.533W.
- Site 2 ran from the sublittoral fringe to the supralittoral above the proposed concrete fender piles. 58° 00'.360N, 6° 32'.628W to 58° 00'.367N, 6° 32'.617W.

Biotopes were identified using the JNCC Marine Habitat Classification, Version 04.05 (Connor *et al*., 2004). Organisms were identified to species (Howson and Picton, 1997) and their abundances noted (Hiscock, 1996). Field recording forms for site and littoral habitats (detailed) were completed, following the guidance of the MNCR publication *Rationale and Methods* (Hiscock, 1996). Positions were fixed and a photographic record taken.

B3 FINDINGS

B3.1 SUBLITTORAL SURVEY

Four principle biotopes were found during the sublittoral survey. The upper infralittoral (0-3.2m bcd) revealed a hard substrate of upper infralittoral small boulders, cobbles and pebbles, with encrusting red coralline algae. *Laminaria saccharina*, growing in its sheltered waters cape form was the characterising species, alongside *Laminaria digitata* and rare *Laminaria hyperborea*. Beneath the kelp canopy an understorey of red seaweeds included *Chondrus crispus*, *Delesseria sanguinea* and *Polysiphonia* species was present (IR.LIR.K.Lsac.Ldig).

A fairly sparse fauna, comprised a variety of mobile crustaceans, *Carcinus maenas*, *Galathea squamifera*, spider crabs, *Pagurus bernhardus* and *Liocarcinus depurator*. On and around the cobbles were *Asterias rubens* and *Gibbula cineraria*. All other species recorded were uncommon.

Below this biotope was a modified hard substrate of highly silted, lower infralittoral (3.2-9.2m bcd), small boulders, cobbles and pebbles, with occasional encrusting red coralline algae. *Laminaria saccharina*, growing in its sheltered waters cape form was the characterising species. Beneath the kelp canopy were a limited number of associated red seaweeds, *Phycodrys rubens* and *Delesseria sanguinea* (IR.LIR.K.Lsac.Pk). The high quantities of silt and the reduced light intensity beneath the kelp presumably contributed to the sparse epiflora.

A sparse faunal component was found both on the *Laminaria* fronds and below the canopy. The most conspicuous animals in the biotope were the mobile crustaceans, *Pagurus bernhardus* and *Carcinus maenas* and the echinoderms, *Asterias rubens* and *Echinus esculentus*. Large, solitary ascidians, particularly *Ciona intestinalis* and *Ascidia mentula* were present, but rare. Also recorded were

tube worms such as *Pomatoceros* spp., Terebellidae, *Sabella pavonina* and rarely, *Chaetopterus variopedatus*.

The upper circalittoral (9.2-17.0m bcd) was a similarly modified, hard substrate of highly silted, small boulders, cobbles and pebbles, with a very sparse fauna of *Protanthea simplex*, *Asterias rubens*, *Pagurus bernhardus*, and *Inachus* and *Macropodia* species. All other species recorded were found to be rare.

An extremely sparse floral component of encrusting coralline red algae and red foliose algae was also present. This biotope was impossible to accurately determine and a habitat complex was assigned to it (CR.LCR).

The lower circalittoral (17.0-26.6m bcd) habitat comprised an expansive plain of cohesive mud that was bioturbated by burrowing megafauna with a conspicuous population of seapens, predominantly *Pennatula phosphorea* (SS.SMU.CFiMu.SpnMeg).

No burrowing infauna was seen, but from the burrows appearance, the prawn, *Nephrops norvegicus* was almost certainly present. At these depths *N. norvegicus* forages for food at night, returning to their burrows at sunrise. Other infauna can only be speculated at as a crustacean, mollusc, echiuran and polychaete faunal assemblage.

Frequent *Pennatula phosphorea* and rare *Virgularia mirabilis* were recorded, while the larger seapen, *Funiculina quadrangularis* was not found.

In addition to the megafaunal burrowers and seapens there were a variety of other animals living on or just below the sediment surface. The burrowing anemone, *Cerianthus lloydii*, and the epibenthic scavengers *Liocarcinus depurator*, *Pagurus bernhardus* and *Asterias rubens* were all present. Frequent *Philine aperta* were recorded on and below the sediment, as were *Aporrhais pespelecani*, *Pecten maximus* and *Aequipecten opercularis*.

On rare occasions bedrock showed through the mud. This had a cover of the anemone, *Protanthea simplex* with occasional sponges and the brittle star *Ophithrix fragilis*.

The three biotopes from the upper infralittoral to the upper circalittoral were all in poor condition with a generally sparse flora and fauna. The lower circalittoral biotope (SS.SMu.CFiMu.SpnMeg) is however on the list of Priority Marine Features for Scottish territorial waters. This biotope was not a classic example of a seapen and burrowed mud community with only occasional *Nephrops norwegicus*, frequent *Pennatula phosphorea* and rare *Virgularia mirabilis*. The habitat is presumably quite extensive, but also a significant distance away from the proposed development. It is a biotope thought to be effected by organic enrichment (Hughes,1998), but unlikely to be affected by moderate inorganic siltation and with careful mitigation the Eisgein proposals should have no major effect on it.

B3.2 LITTORAL SURVEY

Both sites illustrated a typical low energy, littoral rocky shore zonation, prevalent throughout the area.

Site 1 was less steeply sloping, with significantly more gravel and coarse sand. It showed a similar, classic, biotope pattern. At low water the biotope was *Fucus*

serratus on full salinity, sheltered, lower eulittoral, mixed substrata (LR.LLR.F.Fserr.X), leading onto *Ascopyllum nodosum* on mid eulittoral mixed substrate (LR.LLR.F.Asc.X). The upper eulittoral was *Fucus spiralis* on boulders, cobbles and pebble (LR.LLR.F.Fspi.X), below *Pelvetia canaliculata* on a substrate of cobbles, pebbles and stone gravel (LR.LLR.F.Pel). Finally a maritime lichen community occurred in the supralittoral on small boulders and cobbles (LR.FLR.Lic.YG).

The littoral survey, at Site 2, revealed six different biotopes. Starting at the sublittoral fringe, the biotope was an overlap of the upper infralittoral (IR.LIR.K.Lsac.Ldig) and the lower eulittoral (LR.LLR.F.Fserr). Sheltered boulders, cobbles and pebbles were covered by a canopy of the kelp, *Laminaria digitata* and to a lesser extent, *Fucus serratus*. Above this was a lower eulittoral community of abundant *Fucus serratus* on stable boulders, cobbles and pebbles with an associated community (LR.LLR.F.Fserr). This led onto the mid eulittoral biotope of *Ascopyllum nodosum* on full salinity sheltered rock (LR.LLR.F.Asc.FS). Above this was a narrow band of upper eulittoral boulders and cobbles covered by the brown seaweed, *Fucus spiralis* (LR.LLR.F.Fspi.FS). Further up the upper eulittoral, the biotope changed to *Pelvetia canaliculata* on bedrock and boulders (LR.LLR.F.Pel). The final biotope, in the supralittoral fringe, was yellow and grey lichens (LR.FLR.Lic.YG) on bedrock and boulders.

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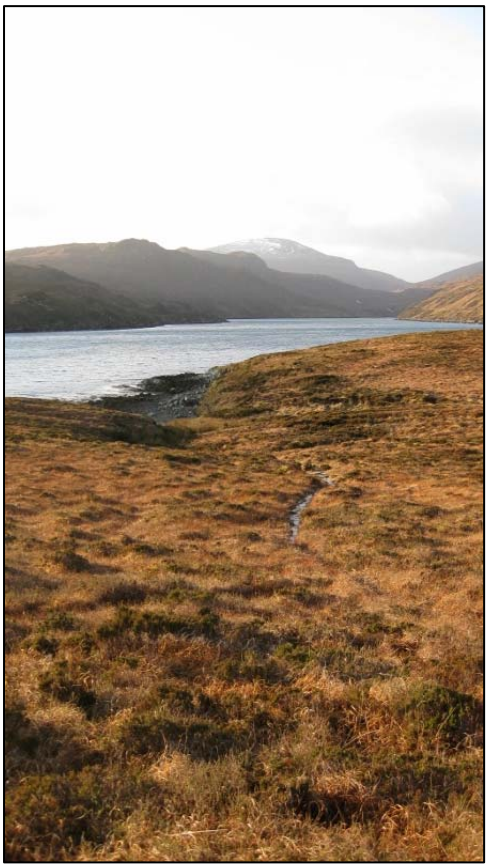
Appendix C

Gazetteer of Photographs

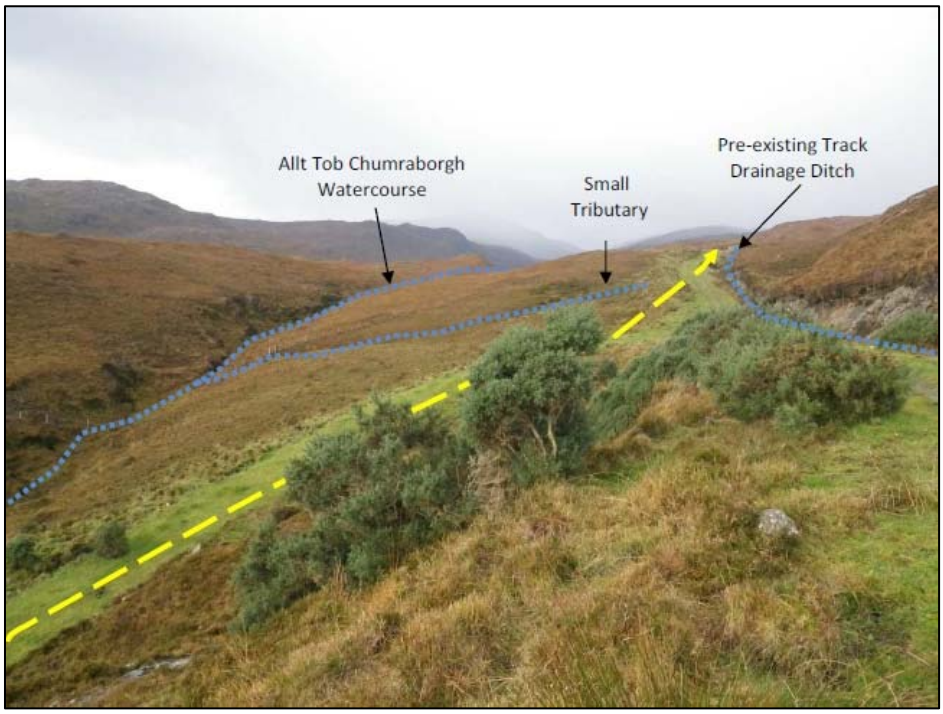
Photograph 1: View looking south to site of marine works on northern shore of Loch Sealg with access track line to right

Photograph 2: View northeast from shore to gently sloping land and the proposed access route to windfarm from the construction berthing facility

Photograph 3: Rocky intertidal area and foreshore



Photograph 4: Small burn/ditch flowing into the inlet where the marine works would be sited



Photograph 5: Route of the proposed new access track to windfarm north of existing access track

Photograph 6: Relatively flat area of land immediately above the proposed shore development – shows characteristic habitat

Photograph 7: Relatively flat area of land immediately above the proposed shore development – shows characteristic habitat

Photograph 8: Small group of aspen at the cliff edge to the west of the site

Photograph 9: Typical seaweeds and silt below shore

Photograph 10: Burrowing megafauna of the lower circalittoral zone – *Pennatula phosphorea* (phosphorescent seapen)

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