STORNOWAY PORT AUTHORITY

Stornoway Deep Water Port - Environmental Impact Assessment Report

Volume 1

Non-Technical Summary

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Contents

1 Introduction

This Environmental Impact Assessment Report (EIAR) has been produced to support updated construction and dredging Marine Licence applications and a Harbour Revision Order (HRO) for the Stornoway Port Authority's (SPA) proposed Deep Water Port (DWP) in Stornoway Harbour limits, situated in Glumaig Harbour. The objective of the DWP and its associated features is to facilitate sustainable economic growth, serving a number of diverse sectors in the Outer Hebrides and the Western Isles.

Marine Construction and Dredge Licence applications for the development of the DWP, were submitted to Marine Scotland in November 2018 accompanied by the previous Environmental Impact Assessment Report (EIAR) (EnviroCentre, 2018b). Consent through an HRO and Planning Permission in Principle (PPiP) were also sought and awarded for the original design.

Design improvements have since been identified for the proposed facility, taking account of ground conditions. Changes to the design have led to the production of a new EIAR in order to inform the Marine Licence and HRO applications. Changes in design do not affect the PPiP so no application to Comhairle nan Eilean Siar (CnES) has been made.

This non-technical summary (NTS) summarises the main findings of the EIAR. The EIAR is made up of 4 Volumes:

- Volume 1: Non-Technical Summary
- Volume 2: Main Assessment
- Volume 3: Appendices
- Volume 4: Drawings

The sections of the NTS mirror the Chapters included within the Main Assessment provided in Volume 2.

Copies of the full new EIAR are available to view in the Stornoway Port Authority Building, Amity House, Esplanade Quay, Stornoway, HS1 2XS. The building is open between 9am and 5pm, Monday to Friday.

Electronic copies of the full marine licence and HRO application documents can be downloaded from the SPA website http://www.stornowayportauthority.com.

A CD containing the full marine licence and HRO consent application documents can be obtained by contacting Fiona Henderson of Affric Limited on [redacted] or by emailing fiona.henderson@affriclimited.co.uk. Hardcopies of the EIAR can also be obtained by contacting Fiona at a cost of £300 plus postage, if required.

If you would like to provide feedback with regard to the marine licence or HRO applications, then this should be given directly to Marine Scotland and Transport Scotland as per the advertised routes.

2 Project Description

2.1 Project Need

SPA is seeking consent for a new DWP in order to facilitate sustainable economic growth in the Outer Hebrides through increasing the range of activities that the port is able to support. The aim of the DWP is to become more attractive and available to the renewable energy, tourism (cruise), commercial freight, and oil and gas decommissioning sectors. As a result, it is envisaged that local businesses will benefit from the increased economic activity and improved transport facilities.

The Arnish Fabrication Yard already handles components for renewables or offshore activities. The pier at Arnish is only 100m long with a water depth of 6.1m, but as wind turbine blades lengths of 7MW wind turbines are in the region of 126m, the existing pier is not suitable for the renewable energy sector's requirements. Hence at least a 200m long berth with deep water is required to accommodate a range of vessels used in the renewable energy sector.

Stornoway is already an established cruise destination. However, due to the lack of appropriate facilities, Stornoway is not attractive to vessels greater than 156m in length, as they must anchor in the outer harbour, an activity which is not popular with cruise companies and is not feasible in bad weather. Cruise ships visiting Scottish ports are increasing in size and can be up to 360m long.

The current freight ferry facilities provided in Stornoway can have capacity issues. Hence additional freight ferry berthing including a linkspan to facilitate Roll-on/Roll-off, with significant water depths is required to assist the commercial movements of freight for a range of industries on the islands.

An access road suitable for coaches and HGV's to the facility will be needed to support the cruise, freight, and other sectors. A heavy load capacity at the quayside coupled with a wide road linking the DWP to the Arnish Industrial Estate will allow the renewable energy and other industries to be serviced by the companies and facilities based there.

2.2 Consideration of Alternatives

The consideration of alternatives has been an iterative process completed as part of the design for the development. The alternatives considered for the main components took into account the following factors as appropriate:

- Constructability;
- Operability;
- Public safety;
- Physical constraints/ restrictions;
- Cost; and
- Environmental effects.

The findings of marine ground investigations, which highlighted soft sections of the seabed, which were not suitable for construction, led to the changes of design from the original proposed in 2018.

2.3 Location

The proposed location for the Stornoway DWP is located on the western coastline of Cala Ghlumaig (Glumaig Harbour), on the Isle of Lewis, approximately 1.1km south of the town of Stornoway. The DWP has a central grid reference point of NB 42333 31164 (Figure 1). Stornoway is the main township on the Isle of Lewis and the current ferry services that run from Stornoway to the west coast of the Scottish mainland provide the shortest possible route. Glumaig Harbour is sheltered and has significant water depths minimising the amount of dredge required to provide a link for large vessels out to the Minch.

Figure 1: Location of the DWP

2.4 Harbour Revision Order (HRO)

The SPA HRO 2019, No. 76 provided the power to construct Newton Marina and the DWP and was issued in February 2019. However, the works detailed in Part 3 of the licence were based on the original design of the DWP and do not entirely cover the revised design of the development. As such a new HRO is sought from Transport Scotland to facilitate the development.

2.5 Project Components

The Stornoway DWP development comprises of the following main components, designed to meet the project needs:

- Main Quay – 306m long and constructed using a combination of king and sheet piles and infilled behind as part of a land reclamation;
- Heavy Load Area – located at the southern end of a land reclamation area and capable of taking 20,000 tonnes of weight;
- Pontoon – 100m long and 4m wide, constructed using a combination of reinforced concrete, steel framing, polystyrene floats and mesh decking;
- Bollard Island – to support the main key, where the largest vessels will overhang the berthing area by 54m, this will provide a securing point for a stern line;
- Freight Ferry Berth and Linkspan – 140m long berth comprised of a combi sheet piled wall or, alternatively a rock revetment may be utilised;
- Reclaimed/Levelled Area 7.5m above Chart Datum (CD), covering approximately 7 Hectare;
- Dredging – the area around the main quay will be dredged to a depth of -10.0m CD;
- Access Road - a two-lane road providing access to and from the DWP;
- Link Road – connecting the DWP to Arnish Point Industrial Estate, with the ability to take 40m wide loads;
- Building(s) – a small office/welfare building with potential future buildings which will be subject to separate consent;
- Drainage – surface and foul water systems;
- Services - including power, water and gas oil; and
- Navigational Elements - including the height reduction of the SS Alabama wreck, -8m CD to remove the associated navigation hazard.

Figure 2 shows the layout of the development, and the full-scale drawing (Drawing SDWP-WS2139-XX-00-DR-C-9022) is provided in Volume 4 of the EIAR.

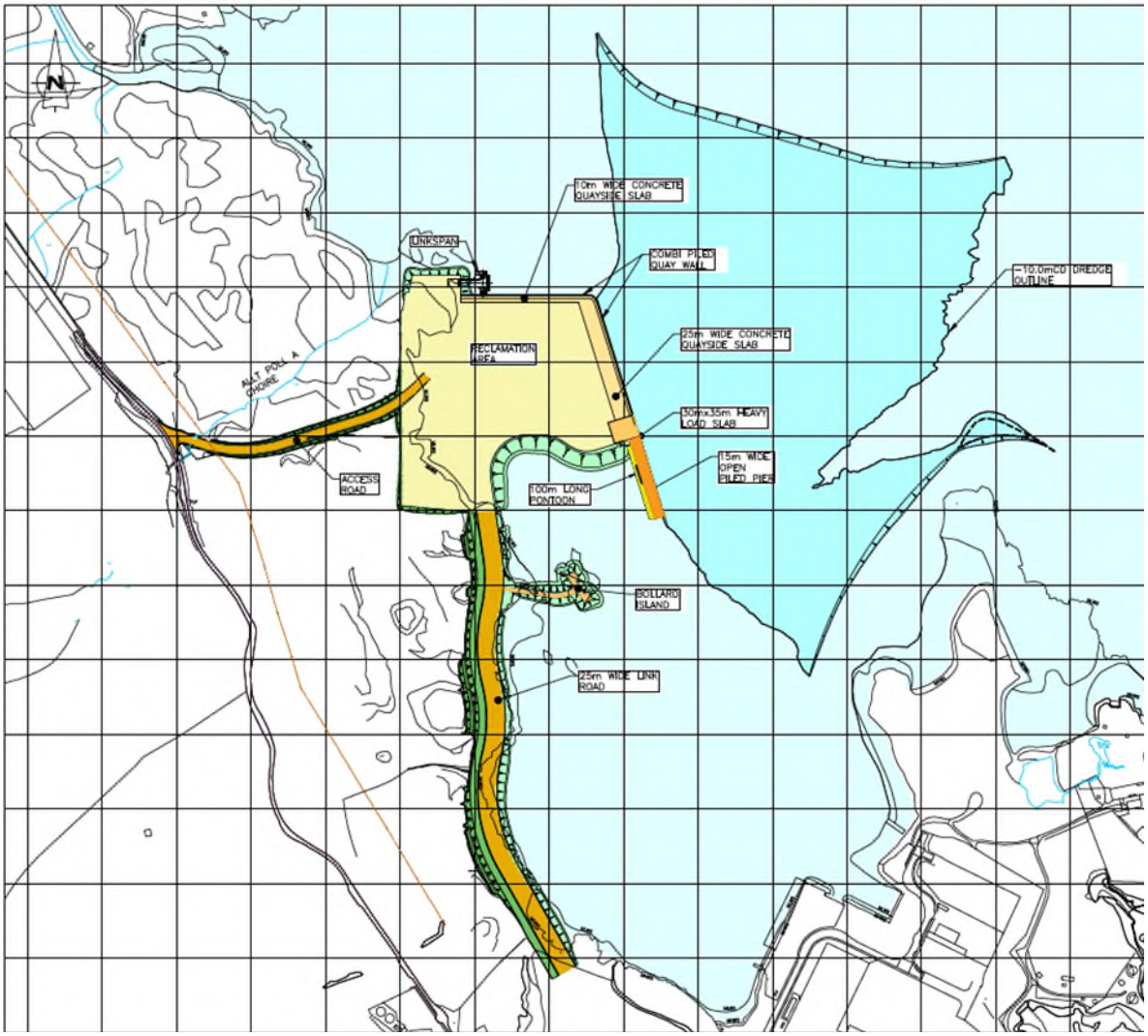

Figure 2: DWP Layout

2.6 Construction

Generally, construction works excluding dredging will be conducted primarily between 7am to 7pm Monday to Saturday. Sunday working is not anticipated to occur. However, work outwith these hours may be required on an infrequent basis to suit tides and vessel movements.

It is expected that work will take in the region of 15 and 20 months to be completed, with multiple tasks ongoing in parallel.

2.6.1 Access Road

The construction of the access road is likely to be one of the first activities carried out, to facilitate access to the main construction site. The route for the road will need to be excavated. This will require the removal of peat and soils, which will be relocated in accordance with the Peat Management Plan which is being agreed with CnES and the Scottish Environment Protection Agency (SEPA). Rock removal to create the road is likely to require an element of blasting. The rock removed will be utilised to create the edges of the land reclamation area. Once excavations have been completed for the access road, it will be appropriately dressed to

facilitate construction access. The road will ultimately be bitumen coated, but this may not be until later in the construction period to minimise damage to the surface during the works.

2.6.2 Piling

Marine piling techniques will be utilised for the Main Quay combi-wall and finger pier, the Freight Ferry Berth combi-wall and linkspan dolphins. Although the pile sizes vary the approach will be the same in that piles will be vibrated into place as far as practicable. Only if the design depths are not achieved will percussion techniques be employed. The combi-wall piles will be installed first as the make-up part of the perimeter of the land reclamation area and hence are required to retain the infill material.

2.6.3 Soil Stripping and Rock Excavation

Soil and peat will be stripped from the road areas and the area to be levelled, to rock level. The removed peat and soils will be relocated in accordance with the Peat Management Plan. Blasting will be utilised to break up around 400,000m^3 of rock for excavation. In the first instance rock arising from blasting will be utilised to create the perimeter of the land reclamation area, to allow infilling works to progress. Rock won will also be utilised in the creation of the causeway to the Bollard Island and in the land reclamation sections of the Link Road. The blasting design will aim to break rock into appropriate size for the reuse purpose, but there may be a need for onsite rock crushing to create material suitable for use as surface finishing for the Link Road and Reclamation/Levelled Area.

2.6.4 Dredging

Dredging will most likely utilise a trailer suction dredger, due to the large volumes of material to be moved and their ability to transit from the area being dredged to the land reclamation area, and pump out the material to infill the land reclamation area directly. Unsuitable material will be discharged via the bottom doors in the disposal ground.

Alternatively, a barge mounted backhoe dredger could be used to fill barges which would be unloaded into the infill area, but this may require a temporary berth, for unloading purposes.

2.6.5 Land Reclamation

A perimeter bund will be created around the Reclamation Area by combi-walls created through piling and rock armoured bunds. Dredge material will be placed within the perimeter to reclaim the land. The land to be reclaimed as part of the Bollard Island and the Link Road will be gained by placing rock directly into the sea. The rock will be appropriately graded and compacted to provide a suitable road and working platform surface.

2.6.6 Link Road

The link road will be formed by excavating parts of the coastline and by land reclamation. The infill material will be heavily compacted to provide the high loading capacity required to support the required design loadings. The road will be surfaced with crushed rock, obtained locally from the excavated material.

2.6.7 Concrete Works

The Main Quay and Freight Ferry Quay will have reinforced concrete capping beams installed. This will require the steel reinforcements to be placed, shuttering formed and concrete to be poured. This will be partly above the water, and as such, care will be taken to ensure that the shuttering is appropriately sealed to prevent leaks to the marine environment.

The linkspan dolphin reinforced concrete pile caps will be formed in a similar way to the capping beams, with reinforcing steel and shuttering formed in situ prior to concrete being poured.

The deck slabs, heavy load pad and bollard blocks (including those of bollard island) will also be poured in-situ, with reinforcement placed as required and shuttering forming the pour areas.

The finger pier and service tunnels will utilise precast reinforced concrete sections wherever practicable to minimise the need for in-situ cement pours.

The linkspan abutment is constructed with concrete poured in-situ into formworks on the rocks above Mean Low Water Springs.

An anti-washout additive will be used for all concrete works above or close to water to prevent loss of concrete to sea.

2.6.8 Fendering Systems, Furnishings and Services

The installation of fendering, furnishing and services will be completed once their associated elements are at an appropriate stage. Items to be installed include:

- Drainage systems;
- Floating fenders at combi-walls, and fender panels and support steelwork at finger pier;
- The linkspan;
- The pontoon;
- Access ladders;
- Sub-station and connection to the grid;
- Water and fuel tanks; and
- Services – water, fuel, electricity, lighting, Information and Communication Technology and all outlet cabinets.

2.6.9 SS Alabama

It is proposed that sections of the SS Alabama wreck above -8m CD will be cut off using hot cutting techniques e.g. broco rods, to reduce risks to navigation. The sections cut from the SS Alabama wreck will be placed within the wreck footprint at water depths below -8m CD. There is no intention to remove any elements of the wreck from the seabed.

2.7 Operations

Operations at the new DWP will be administered, overseen, and controlled from the Port Control Building on No.1 Pier in Stornoway Harbour. There will be an International Ship and Port Facility Security (ISPS) boundary created within the DWP which will be utilised for the management of cruise ship passengers. Operational activities will potentially include:

- Freight ferry movements and associated parking, and marshalling areas;
- Oil delivery vessel berthing and discharging gas oil to the onshore storage tanks;
- Bunkering of vessels;
- Storage and onward distribution of renewable energy sources e.g. hydrogen or ammonia;
- General cargo handling e.g. coal, salt, timber, bulk materials;
- Unloading of renewables components (turbine tower sections, nacelles, blades, transformers etc.) with some temporary laydown and storage;
- Loading large, renewable energy components or modules fabricated at Arnish fabrication yard via the Link Road on to barges or specialist heavy lift vessels;
- Unloading oil and gas modules or components for transfer via the Link Road to Arnish yard for decommissioning; and
- Berthing of visiting supply boats, anchor handling vessels, renewable energy service vessels or other large vessels with draft in excess of the capacity of the other facilities in Stornoway Harbour.

3 Methodology

3.1 Assessment Methodology

In order to determine the possible environmental impacts and likely significant effects that may arise during the construction of, and the operations of the DWP an Environmental Impact Assessment (EIA) was necessary. One of the main purposes of the EIA process is to influence and improve design through iteration.

An environmental specialist has been involved throughout the design process and, where necessary, appropriate topic experts have been consulted to inform the design further. The project design therefore has avoided and minimised impacts wherever possible and, as such, there are embedded 'primary mitigation measures' to avoid or reduce negative effects. These have been incorporated within the assessment of effects.

A methodical and robust assessment of environmental impacts has been used across all chapters of the EIAR, with topic-specific variations incorporated as required. The methodology considers a receptor's value or sensitivities, the magnitude and likelihood of the impact, and through a matrix-based approach, whether or not the impact is significant. If the impact is above a defined threshold, then it is deemed to be significant and additional mitigation measures are put in place where possible to reduce the potential environmental effects. Mitigation to minimise non-significant effects has also been identified in line with best practice.

3.2 Consultation

Early in the EIA process a scoping process was undertaken with Marine Scotland and CnES and their statutory consultees including: Scottish Natural Heritage (SNH), SEPA and Historic Environment Scotland (HES). The scoping process allows the content of the EIAR to be agreed, such that effort can be focused on areas where significant environmental effects could occur.

Consultation has been a key part of the design development and EIA process. There has been dialogue with the local community through public exhibitions as part of the Pre-Application Consultation process. Full details are provided in the Pre-Application Consultation Report.

3.3 Cumulative Impacts

In EIA, it is necessary to consider the potentially significant environmental effects of a proposal together with those of "other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance which are likely to be affected or the use of natural resources. As such, a review of planned onshore and offshore developments was conducted in order to identify projects where there are potential cumulative impacts, and which environmental topic areas they should be considered for. The following projects were taken forward for initial cumulative assessment and were considered in detail to identify the environmental topic areas for which there are potential cumulative effects.

- Uig Ferry Terminal Upgrade (part of the Skye Triangle Ferry Terminal upgrades);
- SPA's Newton Marina project;
- SSE Western Isles Interconnector, Arnish (Onshore and Offshore Elements); and
- SPA's proposed Marine Engineering Workshop, Goat Island.

No cumulative effects were identified for the Uig Ferry Terminal Development or the SSE Western Isles Interconnector project. Potential cumulative effects on navigational issues with Newton Marina were identified and considered in more detail (see Section 16.3). Potential cumulative effects associated with construction noise from the Marine Engineering Workshop on Goat Island and the DWP were also identified for further consideration (see Section 12).

4 Statutory Context & Policy

Within EIA, there are a number of key statutory requirements which require consideration, as well as national, regional and local planning policies. Each of these have been considered in turn specific to the construction of the Stornoway DWP development and utilised in the determination of the Marine Licence application and Harbour Revision Order.

4.1 Legislative Framework

Marine licences for the construction of the Stornoway Deep Water Port Development works and associated dredging will be sought under the Marine (Scotland) Act 2010. Due to the scale of the development and its potential to have a significant effect on the environment, an Environmental Impact Assessment Report (EIAR) is required to support the Marine Licence application, under the Marine Works (Environmental Impact Assessment (EIA) (Scotland) Regulations 2017.

As discussed in Section 2.4 an application will be made to Transport Scotland in line with the Harbours Act 1964 (as amended) for a new HRO. Transport Scotland required an EIAR to

support the previous HRO as a relevant project under The Harbours Act 1964 (as amended), hence this EIAR will be submitted in support of the new HRO application.

The Stornoway DWP falls within regulation 4(d) of The Marine Licensing (Pre-application Consultation (PAC)) (Scotland) Regulations 2013 as a construction activity within the marine area that exceeds 1000m^2 therefore requiring the project to go through the PAC process. A PAC Report will be submitted in support of the Marine Licence application.

In addition to the above regulations, if it is determined that the development of construction activities will likely affect European Protected Species (EPS) listed under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended); which includes: whales, dolphins and porpoise and otter; an EPS licence will be required. A Habitats Regulations Appraisal (HRA) is also required when a project potentially affects a European Natura site (i.e. a Special Protection Area (SPA) or a Special Area of Conservation (SAC)). As the proposed development is near to Natura Sites, an HRA will need to be carried out by the competent authority.

4.2 Policy Context

Planning policy context is set out in relation to both marine and terrestrial landscapes, as the proposed development construction works are necessary both on land and in the marine environment.

4.2.1 National Marine Plan

The Scottish National Marine Plan (NMP) lays out the Scottish Ministers' policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs), most of which apply to the proposed Stornoway DWP development. In addition, the NMP lays out sector specific objectives and policies for shipping, ports, harbours and ferries. The relevant policies have been reviewed and it has been identified that the Stornoway DWP development meets the GEN requirements and contributes towards achieving relevant sector specific policies and objectives.

4.2.2 Planning Policy

The development plan system in Scotland which provides the framework for considering planning applications is made up of four main documents:

- The National Planning Framework (NPF);
- Scottish Planning Policy (SPP);
- Strategic Development Plans (SDPs) produced for the Scotland's four largest cities; and
- Local Development Plans (LDPs) produced for each council area.

The third NPF (NPF3), was published in 2014 and sets out the strategy for development for the next 20 to 30 years (Scottish Government, 2014a). The NPF 3 identifies Stornoway as one of five key ports for internal and global connectivity. Within Section 5: 'A Connected Place', it states that:

'We will reduce the disadvantage of distance for our coastal and island communities'

With regard to 'A Connected Place', the current SPP (Scottish Government, 2014b) also published in 2014 identified policy principles that the planning system should support patterns of development which:

- Optimise the use of existing infrastructure;
- Reduce the need to travel;
- Provide safe and convenient opportunities for walking and cycling for both active travel and recreation, and facilitate travel by public transport;
- Enable the integration of transport modes; and
- Facilitate freight movement by rail or water.

In addition to the development plan system in Scotland, the Highlands & Islands region has its own strategic development plan which supports the National Strategic Plan and the Scottish Government's Economic Action Plan. The Highlands & Islands Enterprise (HIE) 2019-2022 Strategy identifies how industries in the region will contribute significantly to Scotland's economic development through opportunities presented in the energy sector, tourism, the wider marine economy and other industries.

One of the drivers for the DWP is to accelerate local growth in the cruise business by providing improved facilities for larger ships that cannot currently berth at facilities in Stornoway. The proposed development will also provide additional capacity for a freight ferry, adding resilience to the current ferry service and creating berthing space for cargo ships, reducing transport costs and supporting further growth. It would also have the potential to expand facilities to accommodate delivery of turbine components associated with consented and potential future renewable energy development.

Stornoway falls within the area of the Outer Hebrides Local Development Plan (LDP). The latest plan was adopted in 2018 (Comhairle nan Eilean Siar, 2018). The plan lays out visions and objectives for the Outer Hebrides and then goes on to detail policies, including those which planning applications would be assessed against. The LDP supports the development of Stornoway Port in line with the Port Authority's masterplan (Policy STY3). The proposed development has been aligned with other policies of the LDP where appropriate to ensure that it meets the objectives laid out for the Outer Hebrides.

5 LVIA

The Landscape and Visual Impact Assessment (LVIA) considered the effect of the proposed development on the landscape and visual character of the area. Glumaig Harbour is a sheltered inlet, bound by land to the west, south and east, and with aspects towards Stornoway Harbour and the town to the north. The inlet of Glumaig Harbour covers an area of just over 0.2 km^2. The western shoreline is currently undeveloped, whilst the existing Arnish Industrial Estate and associated infrastructure, including existing quay of just over 100 metres in length, occupies the south-eastern shoreline.

The assessment was based upon a study area of 5km from the proposed development. The viewpoints considered in the development were discussed and agreed with SNH and CnES. The locations include areas that are accessible by the public and have a high number of visitors. Figure 3 shows the development area within the red line, the areas that the development will be visible from in purple and the eleven numbered viewpoints utilised in the assessment.

Viewpoints were assessed in terms of their magnitude of effects upon the landscape/coastal sensitivity for all phases. The assessment is based upon a worst-case scenario, as viewpoints were selected to represent the most open views towards the proposed development.

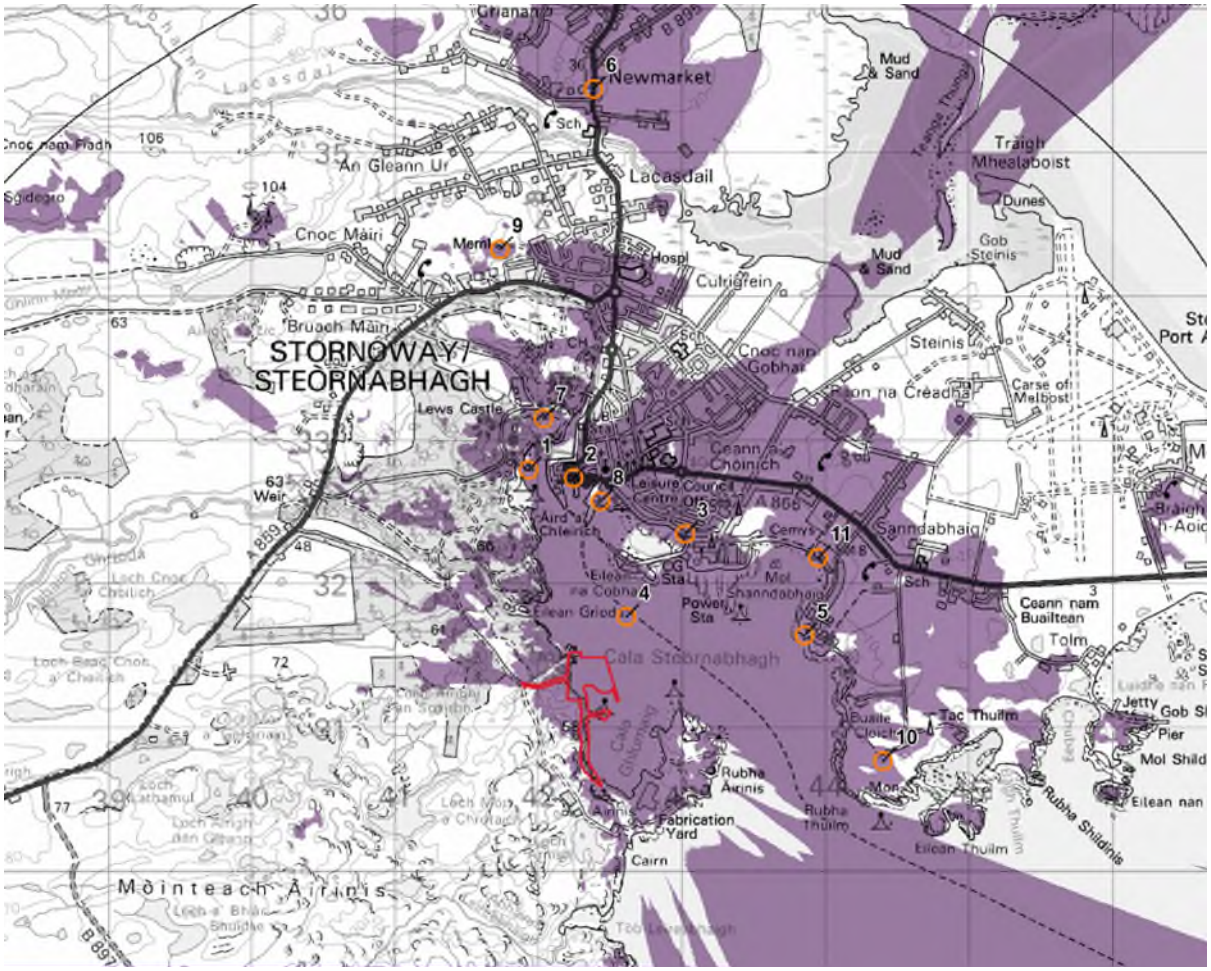

Figure 3: Viewpoint Locations

The area generally benefits from a high landscape and scenic quality. In particular, the wooded grounds of Lews Castle, designated a nationally important Garden and Designed Landscape, provide a distinctive setting to the town and its associated harbour. Along the western coastline, the containing backdrop to the harbour is dominated by undulating moorland slopes and with a rocky coastal edge below, it exhibits a strong semi-character. The town is also a very popular visitor destination and in addition to those working and living in the local area, the scenic views across the harbour are an integral part of visitor's visual amenity. Although much of the western side of the harbour has a prevailing undeveloped character, the busy town and port of Stornoway, and a network of busy main roads and settlements scattered across much of the landscape to the north and east, exert a very strong influence on the nature of the area.

The Viewpoint Assessment considered the worst-case scenario as the viewpoint locations were carefully selected to ensure these provide the most open views towards the site. In many instances, due to the screening effect of nearby intervening built development and vegetation, the experience of any significant visual effect is often restricted to a very small part of the

locality. Furthermore, it should be noted that assessment was based on the worst-case scenario of a large berthed cruise ship.

Photomontages visualisations were utilised to inform the assessment; these can be found in Volume 4 of the EIAR. Figure 4 is an extract of the photomontage from viewpoint 8.

Figure 4: Viewpoint 8 Photomontage

During the 18 months temporary construction phase and long-term operations of the DWP, significant visual effects are predicted on the nine of the viewpoint locations considered.

In relation to the landscape and visual effects during the construction phase, these are judged to be significant on the following receptors:

- recreational users and some residents around Sandwick Bay;
- some residents and visitors on parts of Newton Street and South Beach;
- Stornoway Harbour coastal character area; and
- Lews Castle and Lady Lever Park Garden and Designed Landscape (Construction Phase only).

In relation to the landscape and visual effects during the operational phase, these are judged to be significant on the following receptors:

- Stornoway Harbour CCA
- recreational users and some residents around Sandwick Bay; and
- some residents and visitors on parts of Newton Street and South Beach.

Mitigation measures were identified for consideration within the detailed design and the design of building that may be constructed at a later stage.

It was concluded that although a number of significant landscape, visual and cumulative effects are predicted during the construction and operational phases, these are relatively localised in extent. Where significant effects have been identified as part of the Viewpoint Assessment, these are all within approximately 1.8 km from the site and considering the scale of the proposed development, significant effects would generally be expected for a project of this nature.

It is recognised that where open views across the harbour are experienced, the proposed development would tend to introduce a prominent visual focus against a largely undeveloped backdrop. In many instances, the various parts of the proposed development would also occupy a large part of the view.

Overall, there will be no long-term significant landscape effects on any landscape character types or the Lews Castle and Lady Lever Park Garden and Designed Landscape. However, considering the extent and nature of change across parts of the western coastline of the harbour, the proposed development would result in a significant effect on the Stornoway Harbour coastal character area.

6 Biodiversity

A range of biodiversity receptors may be affected by the development, and these are discussed in detail in Sections 7 to 10. The biodiversity chapter of the EIAR, discussed the regulations and guidance and laid out the methodology which were common to all four chapters. In addition, it introduces the various designated sites which are in place to protect biodiversity.

A Habitat Regulations Appraisal - Pre-Screening Report, considering the Natura sites which could be affected by the development was completed and incorporated as Appendix F.1 in Volume 3 of the EIAR. This is to ensure compliance with the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended), as discussed in Section 4.1.

7 Marine Mammals

The DWP is close to the western region of The Minch, an area renowned for its importance to marine mammals and as such, it was appropriate to assess the potential impact on marine mammals.

Protected areas identified as being relevant to the Stornoway DWP development include the:

- North East Lewis proposed Marine Protected Area (pMPA) 1.3km to the south east and designated for Risso's dolphins;
- Inner Hebrides & The Minch candidate Special Area of Conservation (cSAC) 1.8km to the south east designated and for harbour porpoise; and
- Sea of The Hebrides pMPA 120km to the south and designated for minke whales.

The Sea of The Hebrides pMPA may seem a long way from the DWP but was taken forward for assessment due to the large distances minke whales travel during migrations. They have the potential to be within Stornoway Harbour and the surrounding areas.

A comprehensive desktop study of the current scientific literature was conducted in order to identify which marine mammal receptors may be affected by the Stornoway DWP development. It was established that seven marine mammal species required consideration as

a result of the frequency of sightings and/or degree of residency of each species in the western reaches of The Minch. These included harbour porpoise, short-beaked common dolphin, Risso's dolphin, killer whale, minke whale, humpback whale, grey seals and common seals. When the Stornoway Harbour and Glumaig Harbour were considered at a finer scale to encompass interaction of marine mammals with the construction boundary of the DWP development, the waters within 1km of the development were identified as confined and generally shallow. Water depths are less than 30m, which offers little in the form of valuable marine mammal habitat. As such, it was identified that marine mammal species were unlikely to be frequent visitors to the waters within the proposed development and the adjacent Stornoway Harbour, despite their prevalence in the neighbouring Minch. Reference was also made to the underwater noise model (discussed in Section 11), to predict the potential impacts on marine mammals resulting from underwater noise emissions.

During construction there is the potential for the marine mammal species identified above to be impacted through disturbance due to increased underwater noise emissions, foraging impairment due to increased water column sediment loading during dredging, and injury and displacement due to potential spills of hazardous substances. Only two effects resulting from the construction phase were assessed as having the potential to result in moderate significant effects, in the absence of specific marine mammal mitigation. These included injury and disturbance due to underwater piling noise, and injury resulting from the interaction with dredged spoil disposal operations at the Stornoway spoil ground.

To mitigate the potential impacts on marine mammals resulting from underwater piling noise and dredged spoil disposals, marine mammal monitoring and passive acoustic monitoring protocols will be employed. This is to ensure marine mammals are not in the zone where injury is likely to occur, prior to the operation commencing. Moreover, a soft start procedure, which involves a slow increase in power at the source, is proposed. This will give time for mammals outwith the exclusion zone to move further away from the works. When the water quality and spill prevention mitigation identified in Chapter 14: Water Environment, Soils & Coastal Processes section of the EIAR are considered, the effects of sediment loading, and releases of hazardous substances are assessed as minor and non-significant. Taking account of mitigation, the residual impacts on marine mammals are assessed as minor: non-significant.

8 Fish Ecology

A literature review identified basking sharks, Raitt's sandeel and three diadromous (the ability to migrate between fresh and salt water environments) fish species: Atlantic salmon, sea trout, and European eel, as being potentially present in the marine environment near the Stornoway DWP development. The Sea of Hebrides pMPA designated for basking sharks and the North East Lewis pMPA designated for Raitts sandeel was included in the assessment, but no designated sites for diadromous fish were considered, due to the lack of ecological connectivity to any designated sites.

The literature review identified migration times and habitat preferences for diadromous fish. This found that Atlantic salmon, sea trout, and European eel are only likely to be present in coastal areas close to where their respective riverine habitats meet the marine environment. Most notably, two watercourses flow into Stornoway Harbour, from the north and from the west. The River Creed (Abhainn Ghrloda) is the primary watercourse which flows into Stornoway Harbour from the west, and is situated north of the proposed DWP. At the very

northern tip of Stornoway Harbour, the Glen River meets the harbour. Each of the riverine systems which flow into the Stornoway Harbour identified the presence of diadromous fish species. High densities of Atlantic salmon parr/fry and European eel were identified in the River Creed and sea trout in the Glen River. As such, it is considered possible that migrating diadromous fish will transit through the construction area, and hence be present in the waters in the vicinity of the proposed construction works. However, this is not true for the Stornoway spoil ground since no rivers discharge to the sea in the vicinity of this site.

There is some evidence to suggest that relatively high summer densities of basking sharks are found in the waters to the west of the Outer Hebrides, although the sparse availability of data casts some doubt over this finding. Basking shark are not expected to be present in high densities within the Minch, to the east of the Outer Hebrides, although some sightings have been recorded. When the Stornoway Harbour and Glumaig Harbour were considered at a finer scale to encompass the interaction of fish species with the construction boundary of the DWP development, the waters within 1km of the development were identified as confined and generally shallow. As noted in Section 7, water depths are less than 30m, which offers little in the form of valuable basking shark habitat. As such it is considered unlikely that this species will be present in the immediate vicinity of the Stornoway DWP development. This is also true of the Stornoway spoil disposal ground.

Sandeel abundance in the North East Lewis pMPA was found to be greatest towards the Butt of Lewis, as well as directly east and north east of the Eye Peninsula, at water depths between 50 and 150m. As such they are likely to be absent in the Stornoway Harbour and in the vicinity of Stornoway spoil disposal ground.

The potential effects on diadromous fish, Raitt's sandeel and basking shark due to the development were identified as occurring due to increased sediment loading from dredging and dredge disposal, underwater noise from construction, and accidental release of hazardous substances. However, all potential impacts are predicted to result in non-significant impacts on all fish species. This is due to the location of the project in an area of low value to fish species, together with the implementation of standard industry good practice to minimise deterioration in water quality, see Section 14. As such, no specific mitigation measures are required. However, while impacts on basking sharks resulting from piling and spoil disposal operations were assessed as being non-significant, as a matter of best practice, marine mammal protocols for piling and spoil disposal operations will also apply to basking sharks.

9 Benthic Ecology

In order to appropriately assess the potential effects of organisms in or on the seabed (benthic ecology) from the Stornoway DWP development, the baseline conditions needed to be understood. This was achieved through carrying out a desk-based data review and field surveys. Field surveys involved undertaking video transects which provided imagery of the seabed. The surveys identified multiple habitats in the proposed dredge area. Additional information from ground investigation surveys and a dive investigation of the SS Alabama wreck was also used to inform the assessment.

Figure 5 shows a section of the SS Alabama which has been colonised. The species found are common in Scottish Waters and are not afforded any particular protection.

Figure 5: Colonised Section of the SS Alabama

The data review did not identify any sites specifically designated for the protection of benthic features near the proposed development. One area within the proposed dredge area was identified near the Seid Rocks channel marker as a Priority Marine Feature (PMF) in Scottish Territorial Waters (STW). Inclusion in the PMF does not provide any additional legal protection, however, these are considered sensitive for the purpose of the impact assessment. The communities included in the PMF are classed as Kelp and seaweed communities on sublittoral sediment and *Laminaria saccharina* and red seaweeds on infralittoral sediments (Figure 6).

Figure 6: Still of a Priority Marine Feature

During the construction stage of the development, a number of activities may give rise to potential impacts on benthic ecology including dredging, land reclamation works and the disposal of dredged material. Land reclamation works will result in the permanent loss of habitat. However, no high value habitats or species will be affected by this. Dredging will result in the temporary loss of benthic ecology within the area to be dredged with part of the sensitive PMF habitat noted above being lost. However, it has been assessed that this will not have a significant effect as evidence suggests that these species are highly resilient and have the ability to recover rapidly following disturbance provided the substrate is suitable for attachment. Core samples have shown that the substrate following dredging will be suitable for recolonisation. Approximately a quarter of this area of sensitive habitat will be left in place with careful dredge operations ensuring no more is removed unnecessarily. A slope between the dredged area and remaining habitat will also ensure that the remaining habitat is not undermined. This will allow for organisms in close proximity to aid the recovery of the dredged area through recolonization.

Dredging and disposal activities will result in the remobilisation of sediments which can cause smothering effects to benthic organisms. It was important to assess the likelihood of this on the remaining kelp and seaweed habitat due to its potential for facilitating in the recovery of the dredged area nearby. The substrate which will be dredged is largely made up of dense materials such as cobbles, pebbles, gravel and shells and will quickly fall back to the seabed on remobilisation and so the remobilisation of sediments is not anticipated to have a significant effect on the remaining kelp and seaweed habitat. The sloped area between the remaining habitat and dredged area will also create distance and act as a buffer. Sedimentation is a natural phenomenon in the marine environment and can build up on these habitats during storms. In addition to this, the disposal site to be used has also been in use for some time so it can be expected that these habitats in the area already have some resilience to sedimentation.

No significant effects on any benthic habitats within the proposed development area have been identified with no cumulative effects expected due to other projects being a considerable distance away and effects from the proposed DWP development being localised.

10 Terrestrial Ecology

There are aspects of the development taking place on land, hence the potential for effects on terrestrial ecology required due consideration. Baseline information was collected through carrying out a review of available data and undertaking UAV (unmanned aerial vehicle) surveys. UAV was utilised as field studies were not permitted due to the COVID-19 travel restrictions in place at the time. The survey area was mapped by a suitably experienced ecologist using the Phase 1 mapping methodology which involves recording habitat types and their characteristics. Habitat mapping results were also discussed with a consultant botanist experienced in habitats in the Western Isles. Using this information, previous records and experience of surveying in similar locations, it was possible to predict protected species likely to be present.

The data review did not identify any sites specifically designated for terrestrial ecology features within the immediate area of the proposed development. Dominant habitats identified included wet dwarf shrub heath, dry dwarf shrub heath and blanket bog. Other habitats identified included numerous patches of grassland and coastal habitat made up of hard cliff,

exposed rock and intertidal boulders/rock, brown algal beds and shingles/cobbles. Flush and springs habitat was also identified which are highly dependent on groundwater. Some woodland was recorded but limited to small areas supporting broadleaved and coniferous species, likely including birch, rowan and willow with occasional non-native coniferous species such as Sitka spruce and larch. Some habitat was identified to have the potential to support Ground Water Dependent Terrestrial Ecosystems (GWDTE) which are protected under the Water Framework Directive (Directive 2000/60/EC) (European Commission 2000).

The site has the potential to host a number of protected species including bats, otter, amphibians, reptiles, and birds. Otter are likely to be present on site with suitable habitat identified. Bats may utilise the site for foraging and it is possible that amphibians and reptiles may be present in small numbers. Suitable habitat is available for various species of birds.

Construction of the development will have an impact on various habitat types through habitat loss and disturbance, however, none of these were assessed to have a significant effect due to ample habitat present in the surrounding area. Consideration was however given to flush habitat which is highly dependent on groundwater and mitigation has been designed to minimise impacts on the remaining area to ensure that it does not dry out and to encourage the generation of new flush habitat.

It is possible that, if present, otter may be temporarily disturbed during the construction phase, however it is likely that otters inhabiting this area are already familiar with some disturbance from the Arnish Industrial Estate and from regular disturbance within the Stornoway Harbour area. Some coastal habitat including boulders and rock where otter may rest up or breed will be removed during construction however, this habitat is common across the western isles and makes up a large percentage of the coastline. Furthermore, approximately 1km of rock armour will be installed which is often utilised by otter for resting up and breeding and may therefore provide new habitat.

Mitigation measures, such as ensuring pre-construction surveys are carried out, appropriate exclusion zones installed if required, and measures to prevent entrapment and physical harm to protected species during construction have been identified. Taking account of this mitigation and that identified to prevent pollution (see Section 14), no significant effects on any terrestrial habitats or species have been identified for the DWP development.

11 Underwater Noise

The potential for underwater noise arising from marine construction works was assessed, utilising the underwater noise modelling report from the previous EIAR completed by Irwin Carr. As the noise sources are very similar to those considered in the original DWP design, the chapter compared the current design to that previously modelled. This review identified how the modelling could be interpreted for use in Chapter 7: Marine Mammals and Chapter 8: Fish to determine the impacts on specific ecological receptors.

The noise modelling report considered dredging, drilling (otherwise known as Odex piling) and pile driving as the three most significant sources of noise during construction. These techniques were still applicable to the revised development and were therefore considered in further detail to identify any changes on initial presumptions.

With regards to dredging, dredging techniques had not changed so a direct comparison could be made with the underwater noise modelling report, as noise source levels would be the same. However, the dredge area was greater than that of what was previously modelled (16% larger) and the dredge depth had increase by +0.5m from the original dredge area design. As such, this would give rise to a slight decrease in the ability for noise to dissipate due to a deeper water column and noise would encompass a larger area than previously proposed, although this would still radiate out from the dredge vessel. As more material is also required to be removed extending the dredging operations timeframe, raised noise levels associated with dredging are also anticipated to exist for a prolonged duration. In theory, noise levels will dissipate slightly less as the water depth increases with dredging, giving rise to higher noise levels at given distances from the works, hence increasing the area in which marine mammals would be subject to negative noise implications. However, the depth change from -9.5m to -10m CD is unlikely to make a significant difference.

Source noise levels associated with Odex Piling were identified to have not changed compared to the modelling exercise, although the amount of drilling has been reduced to less than 25% of that previously proposed. Negative noise implications on marine mammals associated with Odex Piling were identified at varying distances depending on the receptor. For example, harbour porpoise hearing could be permanently affected if they remained within 200m of the works for long durations, whereas for minke whale or dolphin species, temporary hearing implications would arise within 500m if the animal stayed in the area for 24 hours. Both of which are highly unlikely. As Odex Piling is now limited to the freight ferry berth, it is expected that negative implications on marine mammal hearing associated with Odex piling are now limited to the north of the development.

The revised design involves a reduction to the size of piles utilised in the design, such that source noise levels could be between 4.1dB and 6.6dB lower than those previous modelled for the main berth, and piles utilised for the heavy load area could give rise to noise levels 13.6dB lower than that modelled. To represent a worst-case scenario, impacts on marine mammals as identified in Chapter 7: Marine Mammals were based on noise levels associated with the largest pile size. The worst-case scenario for the revised design identified noise source levels 4.1db lower than that of those modelled for the previous design. As reduction in noise by 3dB reduces the impact range by up to 50%, the worst-case scenario represents a likely noise reduction of more than 3dB, so it can be safely assumed that the impact ranges modelled for the previous design will be halved. Although this means that zones of temporary or permanent negative hearing implications on marine mammals will have been reduced, these zones will have changed location due to the revision in areas which require piling as part of the revised design. Therefore, temporary or permanent hearing change risk zones may be less to the south and east due to the shorter berth length and smaller piles being used at the south end of the berth, and may be greater to the north and west during the freight ferry berth construction.

This information was utilised to inform the assessment of under-water noise on marine mammals and fish (see Sections 7 and 8) and hence mitigation measures appropriate to the species were identified within those topic areas.

12 In-Air Noise

Environmental, or community noise, is a broad term that encompasses noise emitted from many sources, including road, rail & air traffic, industry, construction, public work and neighbourhood noise. As the construction of the Stornoway DWP is situated at the opposite side of the Stornoway Harbour to Stornoway town centre, consideration to possible noise sensitive receptors were given with regards to the construction and operational activities that are likely to give rise to any changes in noise levels, including increased road traffic.

Noise Sensitive Receptors (NSRs) for construction of and operations at the DWP were identified as the coastal areas of Stornoway, namely South Beach, Newton Street, Seaview Terrace and Builnacraig Street. For noise associated with increased road traffic receptors on the A857 and various streets in Stornoway were identified, based on the traffic assessment (see Section 15).

Similar to underwater noise, the noise sources associated with the DWP have not changed significantly due to the revised design. Hence the Noise Assessment Report (NAR) completed to inform the original EIAR (EnviroCentre, 2018b) was utilised as part of this EIAR. A comparison was made with the current design to that previously considered in the NAR, to ensure that the construction and operational noise levels were acceptable, and to identify appropriate mitigation where required.

The majority of the construction activities are at a sufficient distance from NSRs as to not give rise to any detrimental effects. Dredging in the north of the dredge area at night-time remains the only activity that has the potential to give rise to significant effects during construction primarily at receptors on Builnacraig Street. With appropriate mitigation, this can be reduced to non-significant effects. The mitigation proposed to reduce these effects to non-significant are as follows:

- Dredging of areas to the north of the dredge area will be carried out during the day whenever practicable;
- Prior to night-time dredging in the north of the dredge area (if required), the NSR likely to be affected will be notified; and
- Noise monitoring during dredge activities will be carried out to understand the actual noise levels arising at receptors.

To ensure that construction noise levels are minimised to prevent disturbance of human and ecological receptors, mitigation such a ensuring equipment and vehicles are maintained and are shut down when not in use, has been identified in the line with construction best practice.

The operational noise assessment considered two of the noisiest activities that could be carried out at the DWP: Cargo Ship Loading/Unloading and Decommissioning activities. These were considered individually and in combination. In combination the highest increase at an NSR was 2.1dB, which will be perceptible to the human ear, but is a minor: non-significant effects.

Operational road traffic noise gave rise to increases of less than 1dB at four NSR's, noise increases of less than 1db are not perceptible to the human ear, hence, effects due to road traffic were deemed to be non-significant.

Cumulative effects associated with the construction of the Marine Engineering Workshop on Goat Island were considered, however due to the close proximity of the workshop to potential

NSR, the predominant noise source will be the construction of the workshop and hence no cumulative effects were identified.

13 Cultural Heritage & Archaeology

The Cultural Heritage and Archaeological assessment aims to identify and mitigate any effects of the proposed development on the historic and cultural environment associated with the DWP. The assessment was carried out in accordance with standards and guidance published by the Chartered Institute for Archaeologists. The baseline assessment looked at the DWP development site and an area of 1km beyond. The assessment involved:

- Review of historical maps and records;
- Review of the marine surveys by a marine archaeologist;
- Site visits;
- Computer modelling to show the Zone of Theoretical Visibility (the locations within 5km of the site from which the development would be visible); and
- Assessment of the visual impact of the development on heritage assets in the area.

Baseline information identified a range of medium and high importance heritage assets which are located within the study area including Arnish Point gun emplacements; Loch Arnish Dun and Cnoc na Croich cairn. Furthermore, 32 Listed Buildings, the Stornoway Conservation Area, and the Lews Castle Inventory Garden and Designed Landscape (IGDL) were identified and included for consideration in the impact assessment. Within the marine environment, a total of 14 shipwrecks were identified, 9 of which were considered low in importance and did not hold any significant value. Although 5 shipwrecks were identified as medium importance, only one shipwreck, known as the '*SS Alabama*' was identified within the construction area.

For both construction and operations, the impact assessment concluded that it would still be possible to appreciate and understand the cultural significance of Lews Castle and its grounds upon completion of the DWP, and historic existing views would not be obstructed by the proposed development. Other cultural heritage assets within the study area were identified to not be subject to significant effects.

With regards to the '*SS Alabama*', it is proposed that during construction, sections of the wreck above -8m CD will be cut off using hot cutting techniques. The proposed reduction work will result in the wreck being partially dismantled, but no elements of the ship will be removed from the seabed. This led to significant effects to be identified for this cultural heritage asset.

The implementation of mitigation measures to reduce significant effects included a 'before' reconnaissance survey of the *'SS Alabama'*, undertaken in March 2020. The survey was recorded in video footage and its purpose was to assess the current condition and extent of the wreck, and to determine how much of the wreck projects above -8m CD. An 'after' survey will be completed and subsequent recording will be undertaken to ensure the preservation of the asset's cultural significance. This will reduce impacts to a be non-significant with regards to construction effects.

To take account of the potential for unknown discoveries, a Protocol for Archaeological Discoveries will be put in place for marine finds, and an archaeological watching brief will be put in place for all onshore ground-breaking works.

14 Water Environment, Soils and Coastal Processes

14.1 Water Environment

Consideration was given to changes in the water environment associated with both construction and operational activities. The movement of seabed materials associated with dredging, dredge disposal and land reclamation can give rise to increased sediments in the water column and sedimentation. These can have implications for various ecological receptors. The assessment however identified that the effects will be very localised and short lived due to the majority of the material being sand which will drop out of the water column quickly. Similarly, surface water runoff from areas stripped for onshore construction can also give rise to sediments entering the water environment, however, standard construction practices can be utilised to minimise this, hence no significant effects were identified.

During both construction and operations potential water polluting substances such as fuel oil will be utilised. The potential level of harm that can be caused in event of a loss of containment is specific to the substance and volumes involved. Hence an assessment has been completed for construction activities to identify the risks and inform the requirements for mitigation. Mitigation such as appropriate storage of materials, and maintenance of equipment can be used to minimise the risk of loss of containment, while spill procedures can minimise the effects on the environment if a loss of containment does occur. Similarly, risk assessments and mitigation measures will be put in place prior to operational activities based on the specific activities being undertaken. The DWP drainage system has been designed to include oil interceptors with isolation valves, to contain pollutants in the event of an incident during the operational phase.

The potential to introduce non-native marine species during construction and operations was identified. All vessels will be required to comply with the International Maritime Organisation's International Convention for the Control and Management of Ships' Ballast Water and Sediments Management (Ballast Water Management Convention) and equipment will be delivered clean to site minimising the risk and therefore effects will be non-significant.

The need to minimise litter on the construction site, to protect the marine environment was recognised. All personnel working on the project will undertake a site induction. This will include a section on waste management and the use of the waste receptacles provided. It will be made clear that littering will not be tolerated. Waste receptacles shall be covered. Construction staff will be encouraged to collect any litter they see in the construction areas and, if deemed necessary, litter sweeps will be carried out. The use of single use plastics will be discouraged, reusable water bottles will be supplied to all personnel and reusable crockery and cutlery will be provided in the welfare facilities. All generated waste will be segregated to facilitate appropriate recycling.

Surface water runoff from the roads and around the site will be managed in line with the Sustainable urban Drainage System guidance, including the use of swales and open bottom culverts. The hardstanding areas adjacent to the quays will drain through oil interceptors, while surface water will percolate through the unsurfaced areas of the reclaimed area. The DWP is 3km from the public sewage network hence a package treatment plant will be put in place to deal with foul waste during operations, to ensure that discharges to the marine environment are acceptable.

14.2 Soils

Onshore and marine ground investigations have been completed and have shown that no contamination exists in the ground or seabed. Onshore geology is made up of 100 to 200mm of topsoil which is underlain by peat in some areas with depths of over 1.3m in places. Rock head was encountered at depths ranging from 0.3m to 1.5m below ground level. The bedrock included five main rock types.

Peat probing has been utilised to assess peat depths across the site, as shown in Figure 7.

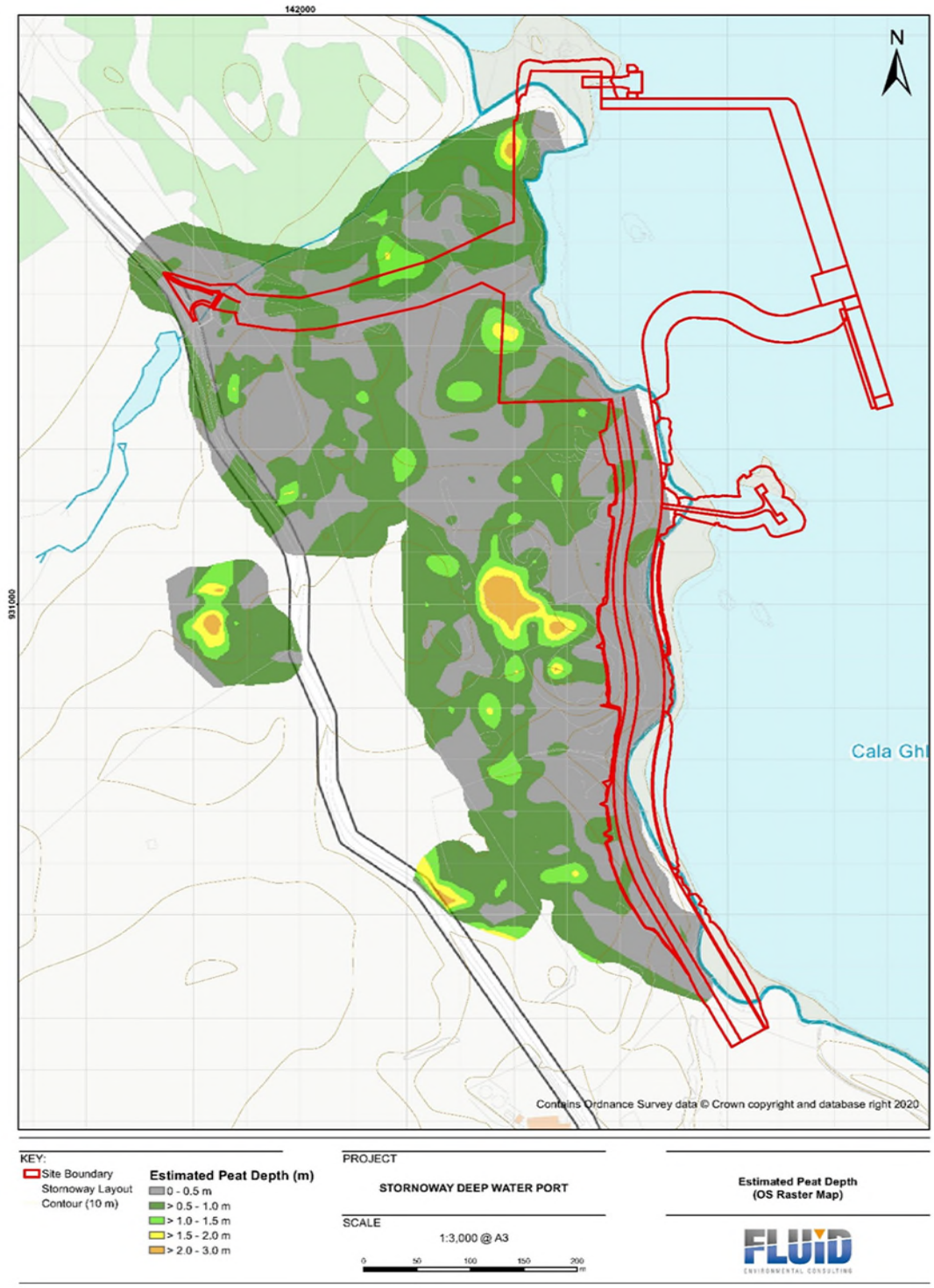

Figure 7: Peat Depth Contours

Approximately 6900m^2 of peat will need to be removed to make way for the DWP and the new roads. Without mitigation, this would give rise to an adverse moderate significant effect. A Peat Management Plan is being developed for the DWP project. Details of this are to be agreed with CnES in consultation with SEPA to meet the requirements of the existing PPiP. The intent is to find areas to reuse the peat in the vicinity of the development. With this mitigation implemented, impacts on peat are not significant.

To create the levelled platform and to win rock for the construction works, an area of hillside will be removed utilising blasting techniques. The effects on geology are very localised hence the rock removal is a non-significant effect. The rock removed will be utilised for the land reclamation hence the rock is not being disposed of.

14.3 Coastal Processes

Modelling has been completed to understand the effects of the DWP on coastal processes once it has been constructed, and the effects of coastal processes on the DWP to be taken account of in the design process. The effect on waves in the event of a 1 in 50-year storm were modelled. They identified that during a storm from the southeast to south direction there is a slight increase in wave heights (approx. 30cm) to the east of the DWP. Similarly modelling of storms from the north to northeast showed both increases and decreases in wave heights in various areas but these were in the order of 20-30cm and hence negligible: non-significant.

Tidal effects on the development were also modelled and found to be very localised. The wider tidal effects were non-significant with changes in current speeds of plus or minus 0.005 metres per second.

The 1-in-200-year flood event anticipates a sea level rise of 3.4m above ordnance datum in this area. This has been taken account of in the design process with the quays and Reclamation/Levelled area being at 4.79m above ordnance datum, 1.39m above the 1-in-200-year flood level. Hence, the development is unlikely to flood.

The modelling considered the effects of the wider Stornoway Harbour Area in terms of the tidal level difference. The change is that surface elevations are between 3mm and 9mm, which in the context of predicted sea level rises of 890mm by the year 2100, is no change and the DWP will not impact upon the flood potential of Stornoway.

14.4 Water Framework Directive

The European Water Framework Directive's (2000/60/EC) primary purpose is to create a framework to protect groundwater, coastal waters, transitional and inland surface waters. The Environmental Liability (Scotland) Regulations 2009 make it an offence to adversely affect a classified waterbody so that its status or potential under the Water Framework Directive is deteriorated.

The DWP is located in the Stornoway Harbour Waterbody, which has an area of 3.1km^2 and includes 13km of shoreline. The waterbody currently has an overall status of Good. The small size of the waterbody means that it theoretically has a relatively low capacity to absorb change. Therefore, a detailed assessment of all the various elements which could affect the waterbody's status has been completed. It is concluded that although there is a potential reduction in the quality of the subtidal area, the overall waterbody status remains Good.

15 Traffic and Transport

A Traffic and Transport assessment was conducted by SYSTRA as part of the previous EIAR (EnviroCentre, 2018b) for the original design of the Stornoway DWP development. As the revised design will not change the requirements of traffic movements to support construction or the activities planned during operations, the original assessment remains valid. However, a few additional considerations have been made in light of feedback from CnES gained through the PPiP process.

It was identified that with regard to onshore deliveries, a maximum of 100 two-way heavy good's vehicle (HGV) movements per day will be required for delivery of auxiliary materials which will make up other elements of the development design. During construction, HGV movements were predicted to be the greatest along Matheson Road with an increase of 39% from current conditions. A857 Willowglen Road and the A857 Macauley Road (south) would experience 17% and 13% increases in HGV movements respectively and there would be no increase on the A859 South of the Access Road and A857 (North). The assessment focused on Matheson Road which was identified as the worst affected road. It identified that the severity of the increase of HGV movements along Matheson Road, the effect of increased HGV movements on driver delay and pedestrian delay and amenity, and effect on accident rate were non-significant.

As part of the additional considerations, it was also recognised that HGV movements along the Arnish Road during the construction phase of the DWP have the potential to affect the surface condition of the road network and as such a road condition survey should be completed prior to construction. In addition there is a need for access to the Arnish Industrial Estate to be retained throughout the construction works, and hence the bellmouth of the Access Road to the DWP, where the Access Road joins the road to the Industrial Estate will need to be suitably phased to ensure access is retained. The need for a survey and to ensure access have been conditioned by CnES in the existing PPiP.

The assessment with regards to operations took into account the redistribution of pre-existing movements associated with freight ferry deliveries with the addition of coach movements associated with tourism. The worst-case scenario with regards to the potential effects of operational traffic were related to a maximum of 60 two-way HGV movements per day and 96 two-way coach trips (associated with tourism) per day. Following construction of the DWP, existing HGV movements are anticipated to be redistributed, alleviating pressure from Stornoway town centre.

Matheson Road, the A859 Willowglen Road and A857 Macauley Road were anticipated to experience the greatest increase in HGV movements during worst-case operations, with increases of 100%, 63% and 33% respectively. Prior to mitigation, significant effects were identified along Matheson Road with regards to the severity of the increase of HGV movements and the effect of increased HGV movements on driver delay and pedestrian delay and amenity. All other effects on other road networks were identified as non-significant.

As Matheson Road would experience worst-case significant effects on pedestrian/driver delays and increases in severity during operations if all vehicles be routed down this road system, especially during peak school hours. It is proposed that HGV/coach movements are scheduled to not coincide with school peak periods. Consultation with Comhairle nan Eilean Siar (CnES) would be required for the designation of appropriate alternative routes but these could also

be considered. Taking into account mitigation, effects on the road network can be reduced to non-significant levels.

16 Other Issues

Chapter 16 of Volume 2: Main Assessment of the EIAR addressed any potential environmental effects which are relevant to the proposed development but will not give rise to any significant environmental effect in EIAR terms. Although the topics individually, do not warrant a full chapter and significance assessment, mitigation to minimise negative environmental effects and to maximise benefits are identified within the chapter for inclusion in the schedule of mitigation. The topics included in the chapter took account of socioeconomics, air quality, navigation, population & human health and materials & waste and are summarised here.

16.1 Socioeconomics

With regard to socioeconomics, the main drivers for the project are to benefit the economy of Stornoway and the Outer Hebrides by providing a multipurpose facility. A Port Masterplan developed on behalf of the SPA, which considered the socioeconomic contexts in which the port operate within, enabling a full market assessment of port requirements to be completed with consideration to industrial, energy, fishing, tourism and lifeline services (Fisher Associates, 2017). The main berth, laydown area and link road to Arnish will allow for the energy sector to establish a long-lasting use of the DWP. In addition, the freight ferry berth will provide an adequate facility for commercial freight deliveries to the island. It is also envisaged that the islands tourism sector will benefit from increased visitor numbers associated with the cruise industry, as dredging will allow large vessels from a range of industries to access the berths.

The construction of the DWP, in conjunction with the already developed Newton Marina, is predicted to create an average of 66 FTE jobs per year for five years (2018-2022) totalling 330 FTE jobs. Local supply chain involvement in the project, will be encouraged as far as procurement laws allow, to maximise local direct and indirect benefits. From 2023-2032 the direct FTE jobs associated with operations is predicted to be 203 per year, with an estimated 357 FTE additional direct and induced jobs per year under base case assumptions. The optimistic development case predicts and average of over 756 FTE jobs per year. These are associated with jobs arising in the commercial freight, cruise tourism, renewable energy and oil and gas decommissioning sectors (Fisher Associates, 2017).

16.2 Air Quality

The main impact of construction works on air quality is normally associated with small solids becoming airborne giving rise to dust. To have an environmental impact there is a need for a source, a pathway, and a receptor for an effect to occur. In the case of the DWP, although blasting and material handling may be a source of dust, dust can only travel small distances (a few hundred meters). The location of the planned works is such that there are no sensitive receptors (residential properties, hospitals etc) close by, hence dust effects are not significant.

During operations, aerial emissions will be associated with transport, the burning of fossil fuels by vessels and vehicle movements giving rise to nitrogen oxide (NO_2), and particulate matter. There are no air quality issues in Stornoway with concentrations of NO_2 well below the relevant National Air Quality Objectives (CnES, 2017). The increase in traffic volumes predicted should

not change this, however it is recognised that mitigation identified in Chapter 15: Traffic and Transport will aid in ensuring that no short-term air quality issues arise.

16.3 Navigation

Stornoway Port Authority are responsible for navigational safety within their harbour limits. During the proposed DWP construction works, there will be vessels associated with the delivery of materials such as piles for the construction works. These will follow standard shipping routes through the Harbour area and as such do not pose a particular navigation risk. The vessels involved in the construction work will be present in the harbour area for long periods of time either in fixed locations or making short journeys and are more likely to have interfaces with other vessels.

The Port Authority will issue appropriate Notices to Mariners prior to the works to inform all vessel traffic of the construction activity and will ensure that there are regular ongoing communications between the Harbour Master and the construction contractors with regard to vessel movements, and that the construction vessels comply with the Port's Safety Management System. Contractors will be required to carry out all works without risk to the safety of other vessels.

The design of the facility in terms of water depths, layout, bollard design and access had input from the SPA Harbour Master and pilots, which has been invaluable to ensuring that the project once constructed can be operated safely and meet their requirements.

The new facilities will be added into the Port Safety Management System, in line with standard procedures, which will ensure the navigational safety for DWP operations. Any new navigational markers will be agreed with the Northern Lighthouse Board prior to installation. The as built information from a hydrographic perspective, including the berth locations, changes in water depths associated with the dredge and the height reduction of the SS Alabama will be provided to the Hydrographic Office, to allow the admiralty charts for the harbour to be updated.

Newton Marina will be in operation by the time that the DWP construction works start. The operation of the Port Authority's Safety Management System during construction and operation of the DWP will take account of the activities associated with Newton Marina, avoiding any negative impacts on navigational safety. The SPA has fulltime Watchkeeper coverage overseeing vessel movements and larger vessels require a pilot or a pilot exemption certificate to manoeuvre within Harbour Limits. Hence there will be no significant effects on navigation associated with the combined activities.

16.4 Population and Human Health

Dust and noise can have implications for human health, but as discussed in Sections 12 and 16.2 the town of Stornoway where the majority of potential receptors are located is too far from the development for these effects to be significant.

The construction and operational phases as discussed in Section 16.2 are predicted to give rise to direct and indirect jobs. Being in employment leads to positive effects on both physical and mental health, due to having the finances to improve living standards and the reduction in stress associated with unemployment. There are also population benefits associated with job creation, in that it will encourage working age people to stay or come and live on the island.

In addition, with sustainable job prospects people are more likely to have and raise a family in the Outer Hebrides, helping to prevent depopulation and reverse the aging population trends which have been predicted (National Records of Scotland, 2020).

The recent COVID-19 pandemic has highlighted the risk associated with communicable diseases, and how travel in particular can facilitate the rapid spread of infection across the globe.

The construction of the DWP will require people to travel to the island to carry out some of the works, which potentially increases the risk to the local population which has to date had very few cases of COVID-19. It is also recognised that the on-island National Health Service (NHS) provision is not large and access to specialist services requires transfer to the mainland. The contractor will be required to carry out a risk assessment for travelling to work on the island and put in place appropriate mitigation measures to minimise the potential spread of COVID-19. The contractor will be responsible for communicating, implementing, and monitoring these risk mitigation measures.

Once operational the DWP is likely to increase the number tourists coming to Stornoway and the Outer Hebrides due to larger cruise vessels being able to berth. The operational phase of the DWP will last decades, as such communicable diseases are considered here in more general terms, not just COVID-19.

CnES are the Port Health Authority for Stornoway and, they are responsible for the enforcement in the control of infectious diseases. The objective of the Port Health Authority is to prevent the introduction of dangerous epidemic diseases as a result of shipping activity, without creating unnecessary disruptions to services. There are statutory powers in place to ensure they can enforce the necessary steps. In addition, cruise ships calling at the DWP will be in possession of a Ship Sanitation Certificates. These are designed to prevent international vessels from causing public health risks and covers ship borne public health risks, vector control and food safety control.

Furthermore, the SPA is legally obliged to take steps to minimise the spread of communicable diseases and will ensure all appropriate guidance is followed relevant to any specific issues arising. Finally, in the event of a pandemic, government guidance and that of the Association of Port Health Authorities, Health Protection Scotland and the Scottish Ports Liaison Network are followed.

16.5 Materials & Waste

With regards to materials & waste, the waste hierarchy will be employed throughout the construction works and will aim to avoid, or minimise waste production where possible, re-use material where possible, segregate waste which cannot be reused for recycling where available, and implement the correct methods of disposal should none of the aforementioned methods be feasible. The re-use of material won from levelling the land and dredging is in line with the Waste Hierarchy. If material arising from dredging is not suitable for reuse, it will be disposed of at the Stornoway spoil disposal ground as this is the Best Practicable Environmental Option (BPEO) (EnviroCentre, 2018a). Compliance with all waste legislation will be required and appropriate arrangements will be in place for managing concrete washings and ensuring that litter is minimised.

17 Schedule of Mitigation

All the mitigation identified throughout the development of the EIAR has been collated in a Schedule of Mitigation. The construction mitigation measures identified will be utilised to produce a Construction Environmental Management Document (CEMD) which provides additional detail on how the mitigation will be implemented, taking into account additional construction information, which will become available later in the project. The CEMD in turn will be implemented by the construction contractor by inclusion of requirements in their Risk Assessment Method Statements. An Environmental Clerk of Works (ECoW) will be employed throughout construction to ensure that the mitigation identified is appropriately implemented. Operational mitigation will be incorporated into the SPA's Port Safety Management System.

18 Conclusions

Impacts in all topic areas have been assessed and appropriate mitigation identified where required, to minimise adverse effects. The significant effects identified, taking account of primary and tertiary mitigation for all topic areas are summarised in Table 18.1.

There were 28 significant adverse effects associated with the construction works without secondary mitigation. Once secondary mitigation was taken into account, the number of residual adverse effects were reduced to 13. The 13 significant residual effects were associated with landscape and visual effects that will occur during the construction phase of the DWP.

The operational phase has 15 adverse significant effects associated with it, relating to landscape and visual effects and transport and traffic issues. The 12 significant effects associated with landscape and visual effects are not reduced through secondary mitigation, although it is identified that no long-term significant effects occur on designated landscapes. Visual impacts on all receptors were recognised as an issue throughout the design process and efforts had been made to minimise the severity of these effects. Nonetheless, it is important to recognise that where open views across the harbour are experienced, the proposed development would tend to introduce a prominent visual focus against a largely undeveloped backdrop. In many instances, the various parts of the proposed development will also occupy a large part of the view and not all significant effects could be designed out. The other 3 significant effects which were associated with traffic and transport were all reduced to non-significant when secondary mitigation was applied.

The EIAR identified 3 significant benefits of the Stornoway DWP development, each of which are associated with socioeconomics and job creation during both the construction and operational phases of the DWP. Construction jobs in the region of 66 Full Time Equivalent (FTE) per year are predicted, once operational an estimated 357FTE direct and induced jobs per year will be created. From a population and human health perspective, the creation of jobs will lead to a reduction in depopulation and aging population issues.

Cumulative effects with other projects were considered but no significant effects were identified.

Table 18.1: Summary of Significant Effects in the Absence of Mitigation. All effects are classified as 'adverse significant' unless it is stated that they have a positive or beneficial impact magnitude.

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Construction							
Cuddy Point	Visual effects from construction	High	Moderate-Major	Localised Mod-Major	Good housekeeping during construction.	Moderate-Major	Localised Mod-Major
South Beach	Visual effects from construction	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Newton Street	Visual effects from construction	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Harbour (offshore)	Visual effects from construction	High	Substantial	Localised Substantial		Substantial	Localised Substantial
Lower Sandwick	Visual effects from construction	Medium-High	Major	Localised Major		Major	Localised Major
Lews Castle	Visual effects from construction	High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Ferry Terminal	Visual effects from construction	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Iolaire Monument Car Park	Visual effects from construction	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Sandwick Bay	Visual effects from construction	Medium-High	Major	Localised Major		Major	Localised Major
Recreational Users and some Residents around Sandwick Bay	Landscape and Visual effects from construction	High	Major	Significant		Major	Significant
Some Residents and Visitors on parts of Newton Street and South Beach	Landscape and Visual effects from construction	High	Moderate-Major	Significant		Moderate-Major	Significant
Stornoway Harbour CCA	Landscape and Visual effects from construction	High	Moderate-Major	Significant		Moderate-Major	Significant
Lews Castle and Lady Lever Park GDL	Landscape and Visual effects from construction	High	Moderate-Major	Significant		Moderate-Major	Significant
Inner Hebrides and The Minches cSAC	Piling noise	International	Adverse Low Short-term Reversible	Moderate: significant	Piling Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
	Spoil disposal		Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Harbour Porpoise	Piling noise	International	Adverse Low Short-term Reversible	Moderate: significant	Piling Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
	Spoil disposal		Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Minke Whale	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Humpback Whale	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Risso's Dolphin	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Short-beaked Common Dolphin	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Killer Whale	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Common Seal	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
Grey Seal	Spoil disposal	International	Adverse Low Short-term Reversible	Moderate: significant	Spoil Disposal Marine Mammal Protocol	Adverse Negligible Short-term Reversible	Minor: Non-significant
NSR06 – Builnacraig Street	Backhoe dredging Nighttime Noise	NSR Category A	Adverse Moderate – Large	Minor to Moderate: significant	Applicable best practice techniques as identified in Section 8 of BS5228. A protocol for handling any noise related complaints will be contained within the Construction Environmental Management Document (CEMD). Dredging of areas to the north of the dredge area will be carried out during the day whenever practicable. Prior to night-time dredging in the north of the dredge area (if required), the NSR likely to be affected e.g. those in Builnacraig Street will be informed.	Adverse Slight - Moderate	Minor: Non-significant

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
					Noise monitoring during dredge activities will be carried out to understand the actual noise levels arising at receptors.		
W1, undesignated wreck of the Alabama	Reduction in height and partial dismantling	Medium	Adverse Medium	Moderate: significant	Programme of survey and recording work accompanied by a report, in accordance with paragraph 4.24 of the NMP, the results of which will be presented in a publicly accessible report.	Adverse Negligible	Negligible: Non-significant
Socioeconomics	Creation of construction jobs		Temporary Beneficial	Significant	Encourage local supply chain involvement in in the project	Temporary Beneficial	Significant
Peat	Peat Removal	Certain	Adverse Medium Permanent	Moderate: Significant	Peat Management Plan including peat reuse strategy to be developed.	Adverse Certain Low Permanent	Minor: Non-significant
Operation							
Cuddy Point	Visual effects from cruise ship present and deep water port	High	Moderate-Major	Localised Mod-Major	The site has been located near to other operational and consented industrial developments, but with balanced degree of separation between them. The indicative scale of the proposed industrial/storage building has been designed so that it does not breach the local skyline, dwarf the local landform or other nearby existing operational and consented industrial development.	Moderate-Major	Localised Mod-Major
South Beach	Visual effects from cruise ship present and deep water port	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Newton Street	Visual effects from cruise ship present and deep water port	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
Harbour (offshore)	Visual effects from cruise ship present and deep water port	High	Substantial	Localised Substantial	The buildings should be simple in appearance with façades coloured to reflect the backdrop of rock and moorland. Where logistically feasible, locate any built development, infrastructure and storage away from the water's edge	Substantial	Localised Substantial
Lower Sandwick	Visual effects from cruise ship present and deep water port	Medium-High	Major	Localised Major		Major	Localised Major
Lews Castle	Visual effects from cruise ship present and deep water port	High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Ferry Terminal	Visual effects from cruise ship present and deep water port	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Iolaire Monument Car Park	Visual effects from cruise ship present and deep water port	Medium-High	Moderate-Major	Localised Mod-Major		Moderate-Major	Localised Mod-Major
Sandwick Bay	Visual effects from cruise ship present and deep water port	Medium-High	Major	Localised Major		Major	Localised Major
Recreational Users and some Residents around Sandwick Bay	Landscape and Visual effects from port related	High	Major	Significant		Major	Significant

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
	infrastructure and activities						
Some Residents and Visitors on parts of Newton Street and South Beach	Landscape and Visual effects from port related infrastructure and activities	High	Moderate-Major	Significant		Moderate-Major	Significant
Stornoway Harbour CCA	Landscape and Visual effects from port related infrastructure and activities	High	Moderate-Major	Significant		Moderate-Major	Significant
Matheson Road	**Severity of Traffic Increase:** Relationship between increased traffic and the infrastructure in place allowing for the ability to cope with increased pressure	Medium	Substantial	Major-moderate: significant	Carefully managed HGV and Coach schedules and route plans.	Moderate	Minor: Non-significant

Receptor	Nature of Impact	Receptor Sensitivity/ Probability	Impact Magnitude	Significance (Absence of Secondary Mitigation)	Mitigation Summary	Residual Impact Magnitude	Significance of Residual Effect
	Driver Delay: relating to increased journey times along road networks **Pedestrian Delay:** Level of intimidation, and/or delay experienced						
Socioeconomics	Direct and indirect job creation		Positive Permenant	Signficant	None required	Positive Permenant	Signficant
Population & Human Health	Job creation, leading to reduction in depopulation and aging population issues.		Positive Permenant	Significant	None required	Positive Permenant	Significant

Key

Significant Effect
Non-Significant

19 References

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20 Glossary

Acronym	Definition
BPEO	Best Practicable Environmental Option
CEMD	Construction Environmental Management Document
CnES	Comhairle nan Eilean Siar
cSAC	candidate Special Area of Conservation
dB	decibel
DWP	Deep Water Port
ECoW	Environmental Clerk of Works
EIAR	Environmental Impact Assessment Report
EPS	European Protected Species
GWDTE	Ground Water Dependent Terrestrial Ecosystems
HES	Historic Environment Scotland
HRA	Habitats Regulation Assessment
HRO	Harbour Revision Order
IGDL	Inventory Garden and Designed Landscape
MMO	Marine Mammal Observers
MPA	Marine Protected Areas
mSAC	marine Special Area of Conservation
mSPA	marine Special Protection Areas
NAR	Noise Assessment Report
NSR	Noise Sensitive Receptor
PAC	Pre-Application Consultation
pMPA	proposed Marine Protected Area
PMFs	Priority Marine Features
PPiP	Planning Permission in Principal
SAC	Special Areas of Conservation
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Areas
STW	Scottish Territorial Waters