Port of Inverness – Maintenance Dredge Works

Environmental Supporting Document

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Contents

1 Introduction

A Marine Licence for Dredging and Sea Disposal is sought from Marine Scotland under the Marine (Scotland) Act 2010 for proposed maintenance dredge works at the Port of Inverness quaysides in the River Ness channel and in the navigational approaches to the harbour area. This Environmental Supporting Document has been produced on behalf of the Port of Inverness to support the licence application.

Several environmental topics have been considered within this document, including consideration under the Habitats Regulations due to the proximity and potential connectivity of the proposed maintenance dredge works to designated sites. In addition, a Best Practicable Environmental Option (BPEO) report has been produced to consider the fate of marine sediments arising from the works. The BPEO is submitted in addition to the Environmental Supporting Document as part of the Dredge and Disposal Marine Licence application.

The purpose of this Environmental Supporting Document is to provide supporting information to the marine licence application process including details of the proposed maintenance dredge location, a description of the proposed maintenance dredge works, the proposed works alignment with the National Marine Plan, and to identify any potential environmental impacts. The associated mitigation that may be required to reduce negative environmental effects is also included.

2 Project Description

2.1 Location

The Port of Inverness is located on the east coast of Scotland, at Inverness, in the Highland Council area, at the mouth of the River Ness (Grid Reference: NH 66130 46957). As part of the maintenance dredge works, pocketed sections of the River Ness channel will be dredged at the South Citadel Quay (Grid Reference: NH 66376 46249), the Central Longman (Grid Reference: NH 66024 46605) and North Longman (Grid Reference: NH 66080 47006) Quays and an area outwith the mouth of the River Ness (Grid Reference: NH 66051 47333).

Drawing 2021-321C shows the dredge area in green, with the specific areas requiring dredge in the summer of 2022 identified.

2.2 Project Need

The Central and South Citadel Quays are utilised by the Port of Inverness, most notably as Inverness' primary bulk fuel delivery quay. If navigational access to these quays became restricted, there could be major implications for the Port of Inverness' operations, and the wider bulk fuel supply to Inverness.

The North Longman Quay, is the main quay supporting the energy and renewables industries. Over the last few years the port has handled turbine machinery for a number of projects including the Corrimony, Rothes II, Berryburn and Clashindarroch wind farms, as well as other equipment for the Moy, Dunmaglass, Corriegarth, Edintore, Hill of Glaschye and Bhlaraidh wind farms being passed through the port. The quay also has a heavy lift pad that can take lifts of up to 200 tonnes through a variety of engineering solutions.

In addition, the Longman Quay is the main operating quay at the Port of Inverness. With a total of 4 berths, the Longman Quay supports the import of salt, packaged timber and logs, as well as the export of woodchip, wood-pellets, logs and Sterling Board. The Sterling Board exports are a commercial connection of Norbord, who actively use the Longman Quay at the Port of Inverness.

Access to this quay needs to be maintained to allow future similar projects to be accommodated.

As well as providing commercial benefits, the Port's marina also provides benefits for local and recreational users.

The aim of the proposed maintenance dredge works are to ensure safe navigational access to the Port of Inverness quaysides and marina. By ensuring safe navigational access, the Port of Inverness can continue to operate commercially and provide a facility for local and recreational users.

2.3 Maintenance Dredge Description

Dredging and disposal will only be carried out during daylight hours, and will be undertaken between the months of July – September, starting in 2022. Dredging operations will most likely utilise a backhoe dredger upon a stationary vessel, and the material will be disposed of through bottom dumping only. Bottom dumping vessels transferring material from the dredge site to the disposal site will be required to adhere to a fixed route, speed and direction.

The first year of the maintenance dredge works will remove areas of material which are above the required operational depths within the Port of Inverness harbour area. These proposed dredge areas combined, as shown by the striped areas denoted in Drawing 2021-321C, will comprise an area of approximately 10,039m^2, with 3,282m^3 of material expected to be removed.

To provide further detail, the four specific areas are required to be subject to a maintenance dredge in the summer of 2022 are as follows:

a) Sections of the River Ness Channel on the approaches to the Port of Inverness will be required to be dredged to a depth of -3.0m Chart Datum (CD) (see Drawing 2021-321C).
b) Areas along the Longman Quay which are above -5.5m CD will be required to be dredged to a depth which is deeper than 5.5m CD. The proposed dredge depth will not exceed 0.75m (see Drawing 2021-322B);
c) Areas along the South Citadel Quay which are above -5.5m CD will be required to be dredged to a depth which is deeper than 5.5m CD. The proposed dredge depth will not exceed 0.3m (see Drawing 2021-322B
d) Areas along the North Longman Quay which are above -5.0m CD will be required to be dredged to a depth which is deeper than 5.0m CD. The proposed dredge depth will not exceed 0.75m (see Drawing 2021-322B).

Maintenance dredges in the River Ness channel will be carried out in subsequent years as required to remove any build-up of material above operational depths to ensure safe navigation is maintained. It is however, recognised that any accumulation of materials are

likely to be in similar areas to those identified in Drawing 2021-321C due to water and vessel movement patterns being relatively consistent.

3 Statutory Context

This section provides a summary of the statutory context which needs to be considered for the proposed development works.

3.1 Marine Licence

Under the Marine (Scotland) Act 2010 several activities listed in Part 4; Section 21 of the Act require a Marine Licence issued by the Marine Scotland Licensing Operations Team (MS-LOT). This includes any activity where the project intends to do any of the following below the Mean High-Water Spring (MHWS):

- Deposit or remove substances or objects in the sea either on or under the seabed;
- Construct/alter/improve any works in or over the sea or on or under the seabed;
- Remove substances or objects from the seabed; or
- Dredging activity.

Due to the proposed maintenance dredge activity occurring below MHWS, a Marine Licence for Dredge and Sea Disposal is required.

3.2 The Habitats Regulations

European sites (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) were originally designated under the EU Habitats and Birds Directives and known as Natura 2000 sites. The primary aim of the Habitats Directive is to maintain biodiversity and is transposed into Scottish law by a combination of the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland), The Wildlife and Countryside Act 1981, and the Habitats Regulations 2010 (in relation to reserved matters).

The Habitats Regulations identify several habitats or species whose conservation interest requires the designation of SACs, which form the Natura 2000 network of protected sites, in conjunction with SPAs.

In addition, the Regulations make it an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licences by NatureScot. These species are commonly termed European Protected Species (EPS) and includes otters and marine mammals such as harbour porpoise.

3.2.1 Habitats Regulations' Appraisal

When a project could potentially interact with a Natura Site (Special Protected Area (SPA) and/or Special Area of Conservation (SAC)) or a Ramsar site, screening is required under the Habitats Regulations to identify if there are any Likely Significant Effects (LSEs). If there are, then an Appropriate Assessment (AA) needs to be completed by a competent authority. Appendix 1 provides the Habitats Regulations Appraisal (HRA) Pre-Screening Report, produced to aid the competent authority's assessment of the designated sites which may have their qualifying interests potentially affected by the proposed maintenance dredge works.

3.3 Wildlife and Countryside Act 1981 and Nature Conservation (Scotland) Act 2004

The Wildlife and Countryside Act 1981 (WCA) (as amended in Scotland) was originally conceived to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and the Birds Directive in Great Britain. It has been extensively amended since it first came into force.

Schedule 5 of the WCA provides special protection to selected animal species other than birds, through section 9(4) of the Act, against damage to "*any structure or place which [any wild animal including the schedules for shelter and protection*", and against causing disturbance whilst in such places.

The WCA contains measures for preventing the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9. It also provides a mechanism making the above offences legal through the granting of licences by NatureScot.

Important amendments to the WCA have been introduced in Scotland including the Nature Conservation (Scotland) Act 2004 (NCSA). Part 3 and Schedule 6 of this Act make amendments to the WCA, strengthening the legal protection for threatened species. The NCSA is also the instrument under which Sites of Special Scientific Interest (SSSI) are protected in Scotland.

The Wildlife and Natural Environment (Scotland) Act 2011 provided a new licensing element to the WCA within Scotland, specifically for certain non-avian protected species 'for any other social, economic or environmental purpose'. This licensing purpose is qualified by two constraints; "*that undertaking the conduct authorised by the licence will give rise to, or contribute towards the achievement of, a significant social, economic or environmental benefit; and that there is no other satisfactory solution*". These actions can be made lawful through the granting of licences by NatureScot.

3.4 National Marine Plan

As the proposed maintenance dredge works will be conducted entirely below MHWS, and within 12 nautical miles (NM) of the Scottish Coastline, it falls within the remit of the Marine (Scotland) Act 2010. The 2015 Scottish National Marine Plan (NMP) covering inshore waters is a requirement of the Act. The NMP lays out the Scottish Minister's policies for the sustainable development of Scotland's seas and provides General Planning Principles (GENs). Many of the GENs are specific to environmental topics; and are identified in Table 3.1, along with how the proposed maintenance dredge works meet the requirements of a specific GEN of the NMP.

In addition, the applicable Scottish NMP Shipping, Ports, Harbours and Ferries Objectives are outlined in Table 3.2.

Table 3.1: Applicable Scottish National Marine Plan GENs

General Planning Principles	Requirements	Port of Inverness Maintenance Dredge Considerations
GEN 2: Economic benefits	Sustainable development and use which provides economic benefit to Scottish communities is encouraged when consistent with the objectives and policies of this Plan.	The aim of the proposed maintenance dredge works is to ensure safe navigational access to the Port of Inverness quaysides and marina. By ensuring safe navigational access, the Port of Inverness can continue to operate commercially.
GEN 3: Social benefits	Sustainable development and use which provides social benefits is encouraged when consistent with the objectives and policies of this Plan.	The aim of the proposed maintenance dredge works are to provide safe navigational access to the facilities at the Port of Inverness which includes a marina and quayside, which are suitable for recreation and commercial uses for locals and visitors.
GEN 4: Co-existence	Proposals which enable coexistence with other development sectors and activities within the Scottish marine area are encouraged in planning and decision-making processes, when consistent with policies and objectives of the Plan.	The Port of Inverness is considered a multi–user facility as it has been developed for use by the commercial logging industry, tourism sector and the leisure boats owned by the local community. Dredge of the navigational channels will ensure this co-existence can continue because of safe navigational access.
GEN 9: Natural Heritage	Development and use of the marine environment must: (a) Comply with legal requirements for protected areas and protected species. (b) Not result in significant impact on the national status of Priority Marine Features. (c) Protect and, where appropriate, enhance the health of the marine area.	Ecological features of interest have been considered within this Environmental Supporting Document and legal requirements have been taken into consideration throughout. Likely significant effects on designated sites are outline in the Habitat's Regulations Appraisal (Appendix 1). Appropriate mitigation measures are outlined in Section 7: Mitigation.
GEN 10: Invasive Non-Native Species	Opportunities to reduce the introduction of invasive non-native species to a minimum or proactively improve the practice of existing activity should be taken when decisions are being made.	The possible sources of invasive non-native species associated with the project have been identified and appropriate mitigation identified to minimise the chance of their introduction. The potential for introduction of non–native species is discussed in Section 6: Potential Impacts.

General Planning Principles	Requirements	Port of Inverness Maintenance Dredge Considerations
GEN 12: Water Quality and Resource	Developments and activities should not result in a deterioration of the quality of waters to which the Water Framework Directive, Marine Strategy Framework Directive or other related Directives apply.	A water quality assessment in undertaken in Section 6: Potential Impacts.
GEN 13: Noise	Development and use in the marine environment should avoid significant adverse effects of man-made noise and vibration, especially on species sensitive to such effects.	No significant noise sources associated with maintenance dredge works are anticipated, as discussed in Section 6: Potential Impacts.
GEN 14: Air Quality	Development and use of the marine environment should not result in the deterioration of air quality and should not breach any statutory air quality limits.	No significant effects on air quality at the proposed maintenance dredge works are predicted as discussed in section 6: Potential Impacts.
GEN 19: Sound Evidence	Decision making in the marine environment will be based on sound scientific and socio–economic evidence.	Information provided in this Environmental Supporting Document is based on current available scientific evidence, to inform the decision-making process.

Table 3.2: Applicable Scottish National Marine Plan Shipping, Ports, Harbours and Ferries Objectives Comparison

Objective/Policy	Requirements	Port of Inverness Maintenance Dredge Considerations
Objective 1	Safeguarded access to ports and harbours and navigational safety.	The aim of the proposed maintenance dredge works is to provide safe navigational access to the facilities at the Port of Inverness which includes a marina and quayside suitable for recreation and commercial uses for locals and visitors.
TRANSPORT 4	Maintenance, repair and sustainable development of port and harbour facilities in support of other sectors should be supported in marine planning and decision making.	The Port of Inverness is considered a multi–user facility as it has been developed for use by the commercial logging industry, tourism sector and the leisure boats owned by the local community. Dredge of the navigational channels will ensure this co-existence can continue as a result of safe navigational access.

4 Methodology

This section sets out the process undertaken in order to provide a methodical and robust environmental assessment that has been implemented throughout the assessment of all topics detailed in this environmental report. The methodology utilised within this report is focused on the identification of potential effects (although not significant in EIA terms) such that appropriate mitigation can be implemented to minimise impacts arising because of the proposed maintenance dredge works.

4.1 Environmental Baseline Considerations

Desk based studies, making use of publicly available reports and data have been reviewed to identify the environmental baseline conditions in the area. This has been supplemented by information on possible protected species in the area. The information provided on possible protected species (i.e., ornithology and otter) is based on surveys undertaken as part of other construction projects proposed at the Port of Inverness.

The baseline information provided in this Environmental Supporting Document is utilised to understand the environmental sensitivities to inform potential impacts associated with the proposed maintenance dredge works.

4.2 Identification of Impacts

Identification of impacts arising from the proposed maintenance dredge works have utilised the baseline information, the works description and professional judgement from experience with similar types of projects and environments.

4.3 Identification of Mitigation

Where appropriate, and/or where potential impacts have been identified, mitigation measures are proposed and recommended to minimise negative environmental impacts.

5 Baseline

Several environmental concerns have been represented in the past and associated with maintenance dredge works, such as bottlenose dolphins, salmon fisheries and freshwater pearl mussels. Thus, these receptors have been included in the environmental baseline assessment, alongside additional relevant topics for both the maintenance dredge area and the dredge disposal site.

5.1 Ecology and Protected Areas

5.1.1 Designated Sites

There are several designated sites in the vicinity of the proposed maintenance dredge works. A 10km buffer was chosen for the selection of designated sites to be considered in this report, as the scale of the works are localised. The sites identified within a 10km buffer are listed in Table 5.1, along with their qualifying features. Drawing 80/01, provides a map showing the locations of the designated sites relative to the proposed development.

As per the Pre-Screening HRA Report (see Appendix 1), any designated sites which are designated for terrestrial immobile features are not considered in Table 5.1, as all the proposed works will be within the marine environment and therefore, the site will not be affected.

Table 5.1: Relevant Designated Sites

Site	Distance & Direction	Qualifying Feature(s)	Comments
Moray Firth SAC	Within the SAC	Bottlenose dolphin (Tursiops truncatus), **Favourable maintained**; Subtidal sandbanks, **Favourable maintained**	Potential for maintenance dredge works to impact on the qualifying feature of bottlenose dolphin of the SAC due to the mobile nature of the qualifying feature and the proximity between the development area and SAC. See Section 5.1.21.
Moray Firth SPA	< 0.1km from W through to NE	Common scoter (Melanitta nigra), non-breeding, **Condition not assessed**; Eider (Somateria mollissima), non-breeding, **Condition not assessed**; Goldeneye (Bucephala clangula), non-breeding, **Condition not assessed**; Red-breasted merganser (Mergus serrator), non-breeding, **Condition not assessed**; Red-throated diver (Gavia stellata), non-breeding, **Condition not assessed**; Scaup (Aythya marila), non-breeding, **Condition not assessed**; Shag (Phalacrocorax aristotelis), breeding, **Condition not assessed**; Shag (Phalacrocorax aristotelis), non-breeding, **Condition not assessed**; Slavonian grebe (Podiceps auritus), non-breeding, **Condition not assessed**; Velvet scoter (Melanitta fusca), non-breeding, **Condition not assessed**	Potential for maintenance dredge works to impact on the qualifying ornithology features of the SPA due to the mobile nature of the qualifying feature and the proximity between the development area and SPA. See Section 5.1.3.1.

Site	Distance & Direction	Qualifying Feature(s)	Comments
Merkinch LNR	~ 0.2 km W	No specific designated features.	Qualifying features found at the Moray Firth and Inner Moray Firth SPA are also likely to be found at the Merkinch LNR due to the proximity of each designation to one another. Although the Merkinch LNR won't be considered specifically in this Environmental Supporting Document, potential impacts on the ornithology features likely to be found there will be considered under the other designated sites.
Beauly Firth SSSI	~ 2.4 km W	Goosander (Mergus merganser), non-breeding, **Unfavourable no change**; Greylag goose (Anser anser), non-breeding, **Favourable maintained**; Red-breasted merganser (Mergus serrator), non-breeding, **Unfavourable no change**; Saltmarsh, **Favourable maintained**; Vascular plant assemblage, **Favourable maintained**	Degree of potential connectivity with the ornithological features of the site due to their mobile nature. However, these features are also protected under the Moray Firth and Inner Moray Firth SPAs and thus potential impacts will be considered under a higher level of protection to remain conservative. There is no connectivity between the immobile features of saltmarsh and vascular plants and the proposed maintenance dredge works.
Longman and Castle Stuart Bays SSSI	~ 2.9 km SE	Cormorant (Phalacrocorax carbo), non-breeding, **Unfavourable no change**; Goldeneye (Bucephala clangula), non-breeding, **Favourable maintained;** Red-breasted merganser (Mergus serrator), non-breeding, **Unfavourable declining**; Redshank (Tringa totanus), non-breeding, **Unfavourable declining**; Wigeon (Anas penelope), non-breeding, **Favourable maintained;** Saltmarsh, **Favourable maintained;** Mudflats, **Favourable maintained;**	Degree of potential connectivity with the ornithological features of the site due to their mobile nature. However, these features are also protected under the Moray Firth and Inner Moray Firth SPAs and thus potential impacts will be considered under a higher level of protection to remain conservative. There is no connectivity between the immobile features of saltmarsh, mudflats and eelgrass beds and the proposed maintenance dredge works.

Site	Distance & Direction	Qualifying Feature(s)	Comments
		Eelgrass beds, **Favourable maintained**	
Inner Moray Firth RAMSAR	~ 2.4 km W & ~ 2.9 km SE	Bar-tailed godwit (Limosa lapponica), non-breeding, **Favourable maintained**; Greylag goose (Anser anser), non-breeding, **Favourable maintained**; Red-breasted merganser (Mergus serrator), non-breeding, **Unfavourable no change**; Redshank (Tringa totanus), non-breeding, **Favourable maintained**; Waterfowl assemblage, non-breeding, **Favourable maintained;** Saltmarsh, **Favourable maintained;** Sand dunes, **Unfavourable no change**; Shingle, **Favourable declining**	Degree of potential connectivity with the ornithological features of the site due to their mobile nature. However, these features are also protected under the Moray Firth and Inner Moray Firth SPAs and thus potential impacts will be considered under a higher level of protection to remain conservative. There is no connectivity between the immobile features of saltmarsh, sand dunes and shingle and the proposed maintenance dredge works.
Inner Moray Firth SPA	~5.0 km W & ~2.9 km E & ~5.1 km N	Bar-tailed godwit (Limosa lapponica), non-breeding, **Favourable Condition**; Common tern (Sterna hirundo), breeding, **Unfavourable No Change**; Cormorant (Phalacrocorax carbo), non-breeding, **Unfavourable No Change**; Curlew (Numenius arquata), non-breeding, **Favourable Condition**; Goldeneye (Bucephala clangula), non-breeding, **Favourable Condition**; Goosander (Mergus merganser), non-breeding, **Unfavourable No Change;**	Potential for maintenance dredge works to impact on the qualifying ornithology features of the SPA due to the mobile nature of the qualifying feature and the proximity between the development area and SPA. See Section 5.1.3.2.

Site	Distance & Direction	Qualifying Feature(s)	Comments
		Greylag goose (Anser anser), non-breeding, **Favourable Condition**; Osprey (Pandion haliaetus), breeding, **Favourable Condition**; Oystercatcher (Haematopus ostralegus), non-breeding, **Favourable Condition**; Red-breasted merganser (Mergus serrator), non-breeding, **Favourable Condition**; Redshank (Tringa totanus), non-breeding, **Favourable Condition**; Scaup (Aythya marila), non-breeding, **Favourable Condition**; Teal (Anas crecca), non-breeding, **Favourable Condition**; Waterfowl assemblage, non-breeding, **Favourable Condition**; Wigeon (Anas penelope), non-breeding, **Favourable Condition**	

5.1.2 Marine Mammals

All cetacean species in Scotland are given protection under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) as European protected species (EPS), where the deliberate killing, disturbance or the destruction of these species or their habitat is prohibited.

Although not afforded the strict protection of EPS through the Habitats Directive, pinniped species occurring in Scottish waters are listed in Annex V of the Habitats Directive, and as such, certain methods of catching or killing pinnipeds are prohibited under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended). In addition, pinnipeds and their haul-out sites are protected under the Marine (Scotland) Act 2010.

As the proposed maintenance dredge works are located within the Moray Firth SAC designated for bottlenose dolphins, and located close to the designated Beauly Firth haul-out site for harbour seals (*Phoca vitulina*) seal species, baseline information on marine mammals considered in sections 5.1.2.1 and 5.1.2.2 are specific to those species. Potential impacts on the receptors are also considered in Section 6 and are relevant to other possible marine mammal receptors in the area.

5.1.2.1 Bottlenose Dolphins (*Tursiops truncatus*) & the Moray Firth SAC

The Moray Firth SAC is located in the north-east of Scotland, covering an area of 15,1274 ha. The SAC is designated for subtidal sandbanks and bottlenose dolphin. The area is of key importance to the UK east coast bottlenose dolphin population, and is regularly utilised by over 100 individuals annually, which equates >50% of the population (Cheney et al., 2018). It has been shown that the percentage of the population utilising the SAC has declined, however this is likely due to the fact that the population size is increasing, and hence the population is utilising a larger habitat area (Cheney et al., 2018).

Bottlenose dolphins are highly mobile, and are known to frequent the lower reaches of the River Ness, and hence may be present in the vicinity of the proposed works.

5.1.2.2 Harbour Seals (*Phoca vitulina*)

Harbour seals are present in UK waters year-round. Pups are born during the summer in June and July. During this period, females spend a high proportion of time ashore with their pups (Hammond et al., 2004; SCOS, 2017). Harbour seals moult in August (SCOS, 2017) and numbers at haul out sites are highest at this time. The Beauly Firth haul out site for harbour seals lies approximately ~ 2 km west of the proposed maintenance dredge works and it is therefore possible harbour seals could be present in the vicinity of the proposed works. This is more likely to occur immediately before, after and during the main pupping and moulting seasons when harbour seals are utilising the haul out site.

5.1.3 Ornithology

Baseline information on ornithological features and their designated sites are considered in Sections 5.1.3.1 and 5.1.3.2, with specific regard to species designated under the Moray Firth and Inner Moray Firth SPA's.

Other ornithological species, not designated under an SPA, could also be present in the area. Bird surveys along the banks of the River Ness in 2017 identified the presence of several species listed under the 'Bird of Conservation Concern (BOCC)' List; these were:

- Wren (*Troglodytes troglodytes*) (BOCC Amber List Species);
- Oystercatcher (*Haematopus ostralegus*) (BOCC Amber List Species);
- Common gull (*Larus canus*) (BOCC Amber List Species);
- House sparrows (*Passer domesticus*) (BOCC Red List Species); and,
- Herring gulls (*Larus agentatus*) (BOCC Red List Species).

Of the species identified as present on-site by the bird survey, only wren were confirmed to be breeding along the banks of the River Ness. Wrens, however, do not utilise water bodies for foraging or breeding purposes.

Any potential impacts on the receptors are considered in Section 6 and where required, mitigation will be proposed in Section 7: Mitigation. As dredge and disposal works will be carried out solely below MHWS, impacts on breeding birds and their nests are not discussed in Section 6.

5.1.3.1 Moray Firth SPA

The Moray Firth SPA is designated for a variety of ornithological species as detailed in Table 5.6.1, and covers an area of 1,762 km^2, stretching seaward from the Helmsdale coast to Portnosy and includes the outer Dornoch and Cromarty Firths, Beauly and Inverness Firths, and part of the Moray Firth (SNH, 2016).

The Moray Firth SPA has been designated to protect 10 species of inshore wintering waterfowl. Notable qualifying species are the great northern diver (6% of UK population), red-throated diver (2% of UK population) and Slavonian grebe (4% of UK population) which are all Annex 1 species. In addition, the velvet scoter has a population size of 1,490 within the SPA, which represents 60% of the total UK population. The site also contains large populations of long-tailed duck, greater scaup and European shag, which represent 46%, 18% and 16% of the UK population respectively (SNH, 2016).

The site only contains one breeding bird species, the European shag, with an estimated population of 5,490, representing approximately 10% of the whole breeding European shag population in the UK (SNH, 2016).

5.1.3.2 Inner Moray Firth SPA

The Inner Moray Firth SPA is located north of Inverness, comprising of the Beauly Firth and Inverness Firth, covering 2,339ha of extensive intertidal flats and small areas of saltmarsh. The site is designated for its large wintering and migratory waterfowl assemblage. It had a mean number of waterfowl of 39,709 over the 5-year period 2011-2016 (BTO, 2018). These habitats also provide important foraging grounds for locally breeding osprey and common tern (JNCC, 2005).

The Inner Moray Firth SPA is also designated as a RAMSAR site for birds, waterfowl assemblages and costal habitat features (saltmarsh, sand dunes, shingle, intertidal mudflats and sandflats) as detailed in Table 5.1 (SNH, 2019).

5.1.4 Otter (Lutra lutra)

Otter are known to be present within the lower section of the River Ness and in the spring of 2019 an otter survey was conducted by Affric determine the extent and nature of otter utilisation of this area. This otter survey was conducted as part of another development, but

the results of the survey are still applicable here. Full details of the otter survey, including methodologies and results are provided in Appendix 2: Otter Survey Report.

The survey found extensive evidence demonstrating that otters are present along the River Ness and the mouth of the River Ness. Two otter activity hotspots were identified; on the rock armour to the northeast of the Inverness Marina, and on the rock armour to the south of the Gaelforce Marine compound. Numerous spraints and feeding remains were found in both areas. Old spraints were also found on the Longman and South Citadel Quays, showing these areas are frequented by otters, although less regularly.

The presence of otter is not anticipated to be a major issue during the proposed maintenance dredge works, given that no works will interfere with their terrestrial habitat use. It must be acknowledged however, that otter have the potential to utilise floating plant when not in use.

As such, potential impacts are considered in Section 6. Where required, mitigation will be proposed in Section 7: Mitigation.

5.1.5 Atlantic salmon (*Salmo salar*)

Atlantic salmon are widely distributed in Scotland's river systems, and are present across the temperate and polar regions of the northern hemisphere. The fish are anadromous (migrate from sea but spawn in freshwater), living in freshwater as juveniles prior to migrating to sea as post-smolts where they mature. Once sexual maturity is reached, they return to their native rivers to spawn (Godfrey et al., 2014). Migration of salmon to the wider River Ness catchment area by sexually mature salmon will occur from the Moray Firth, and past the proposed development along the River Ness, as this is the only route from the wider North Sea. Similarly, all seaward post-smolt runs will occur via that route.

Monitoring of post-smolt runs in the Cromarty Firth determined that they occur from late April to late June, with a peak in May (Cromarty Firth Fisheries, 2008; Malcolm et al., 2010). Localised post-smolt run data for the Ness system could not be determined, although the close proximity of the Cromarty Firth make the likely migration times comparable.

Adult Atlantic salmon runs usually occur between November to December, but in larger river systems it may extend from October to late February (SNH, 2017a).

Atlantic salmon in the Ness system also acts as an essential host species during the early life cycle for the localised freshwater pearl mussels in River Moriston SAC. This is due to the fact that the pearl mussel larvae require to attach to salmon gills in order to develop (SNH, 2017b).

5.1.6 Benthic Ecology

During pre-disposal sampling for the associated maintenance dredge works, blue mussels (*Mytilus edulis*) were identified to be present at one of the sampling points (Grab Sample 3 on Drawing 2021-321C). The sampling point is within the navigational channel of the Port of Inverness, and as such, requires to be dredged.

As blue mussel beds are defined as a Priority Marine Feature (PMF) under the Marine (Scotland) Act 2010 and are included on the OSPAR (Annex V) list of threatened and declining species and habitats, a benthic survey was conducted to understand the extent of the bed and whether the national PMF status of blue mussels may be affected. The purpose of the survey was to

also identify whether the PMF status of other benthic species that may be present within the harbour area may be affected. A full Benthic Video Survey Report, with drawings included indicating habitat extent and image stills of the habitats found, can be found in Appendix 3.

Benthic video surveys undertaken on the 6th and 7th January 2022 identified two potential PMFs and are as follows:

- 'Blue mussel, *Mytilus edulis* beds on mixed infralittoral sediments' (EUNIS Code: A2.721); and,
  'Kelp, *Laminaria hyperborea* on tide-swept infralittoral mixed substrata' (EUNIS Code: A3.213).

The 'Blue mussel beds on mixed infralittoral sediments' (EUNIS A2.721), were found throughout the far north of the dredge boundary and in areas west of the dredge channel, north of Carnac Point and within the north-easterly sections of the dredge area (see Drawing 80_DRG_04_1). Blue mussel beds found along the most north-easterly parts of the dredge boundary were sparse and fractured in nature within sublittoral coarse sediments (EUNIS A5.1) and are not considered a good quality example of the PMF. Blue mussel beds found north and north-west of Carnac Point, and along the western shoulder of the dredge boundary were densely populated and much more representative of the PMF.

The PMF feature 'Kelp, *Laminaria hyperborea,* on tide-swept infralittoral mixed substrata' (EUNIS A3.213) was limited to the north of Carnac Point (see Drawing 80_DRG_04_1), outwith the dredge boundary and along the outer, western edge of the dredge boundary. Video transects were unable to determine whether areas of kelp in this instance were representative of a PMF habitat, or whether they were fractured in nature. However, because they remain predominantly outwith the dredge area, they will remain unaffected.

Potential impacts associated with benthic ecology are discussed in Section 6: Potential Impacts.

5.2 Archaeology

A review of maritime archaeology assets was completed during a desk-based assessment. The desk-based assessment was conducted using Historic Environment Scotland's (HES) tool, 'PastMap'. Only maritime archaeology was considered in this assessment, given that all works will be undertaken below MHWS. No maritime assets were identified. As such, archaeology is not considered in Section 6: Potential Mitigation.

In addition, all areas to be dredged have previously been subject to maintenance dredge works and as such it is unlikely that any archaeological items will be found. As such, a protocol for archaeological discoveries is not proposed for the maintenance dredge works.

5.3 Land, Air and Water

5.3.1 Land

Within this baseline assessment of the land at the Port of Inverness, land is considered to be that of the material making up the seabed, as all works will be undertaken below MHWS. Pre-disposal sampling of the dredge material has been undertaken and the results of the analysis have been used to inform the baseline.

The results of the analysis identified that particle size distribution (PSD) of the dredge material was comprised of 31.9% solids. Of these solids, on average 1.1% of the material was comprised of gravel, 17.4% was sand, and 81.5% was silt. The high silt content makes the material unsuitable for reuse. The dredge material analysis showed there to be no trace metals, organotins concentrations above Action Level 1. There were some minor exceedances of AL1 of polyaromatic hydrocarbons (PAHs) on individual samples, however on average there were no issues as shown in the Pre-Disposal Sampling Results spread sheet and discussed in the BPEO. As such, potential impacts associated with contamination were not considered in Section 6: Potential Impacts.

5.3.2 Air

The proposed maintenance dredge works will take place primarily in an already industrial setting. Despite this, the Inverness area as a whole has Good Air Quality status (The Highland Council, 2019), with no exceedances of particulate matter ($PM_{2.5}$ and PM_{10}) in 2018. Monitoring stations in Inverness which supply the information for authoring of progress reports are also situated in much developed and urban settings. As such, air quality is also expected to be good at the location of the proposed maintenance dredge works. An updated Highland Council Air Quality report was scheduled for release in 2020, but due to the COVID-19 pandemic, this report is still yet to be published.

Potential impacts associated with air quality are discussed in Section 6.

5.3.3 Water

As discussed in Section 5.1, maintaining water quality is essential for the welfare of ecological receptors in the vicinity of the works. In addition, each water body in the area has a classification status based upon the Scottish Environment Protection Agency's (SEPA) Water Classification Hub (SEPA, 2021a) and River Basin Management Plan (SEPA, 2021b). The following bodies of water which may be affected by the works were given the following classifications:

- Beauly Firth – Good Overall Status; and
- Moray Firth – Good Overall Status.

The Beauly Firth is considered a transitional body of water, as it meets the mouth of the River Ness. As such, SEPA's Water Classification Hub includes a small proportion of the River Ness (including all sections of the River Ness which are utilised by the Port of Inverness) within the Beauly Firth in its classification system (SEPA, 2021a). Sections of the River Ness which are proposed to undergo maintenance dredge works are therefore also given a Good Overall Status through SEPA's classification system.

Although works are only required to be undertaken in the Beauly Firth/River Ness systems, the Beauly Firth and the Moray Firth are connected. Potential impacts associated with the Beauly Firth are therefore also transferable to the Moray Firth and a good overall status for both water bodies is required to be maintained.

Potential impacts associated with water quality are discussed in Section 6.

5.4 In-Air Noise

The site is an existing harbour within the city of Inverness. Ambient noise levels in the area are generally elevated, due predominantly to road traffic on Shore Street to the east of the proposed maintenance dredge works, which is noted as carrying industrial traffic servicing the industrial estates and the Port of Inverness. Other dominant noise sources include the Inverness to Beauly rail line which crosses the River Ness immediately to the south of proposed maintenance dredge works, and existing harbour activities through the Port of Inverness harbour area. North of the proposed maintenance dredge works lies the Kessock Bridge, where noise levels are elevated due to road traffic.

Residential areas are located to the south of the dredge area within the River Ness, and along the western banks of the River Ness and could be considered sensitive noise receptors.

As maintenance dredging will have recommended working hours restricted to 07:00 to 19:00 Monday-Friday, 07:00 to 13:00 on Saturdays, with no working on Sundays (see Section 7: Mitigation), in-air noise is not anticipated to be a major issue and as such, is not discussed in Section 6: Potential Impacts. Further mitigation is provided in Section 7.

5.5 Underwater Noise

Ambient (background) noise levels are currently estimated at around 130 dB re 1 µPa for UK coastal waters (Nedwell *et al.,* 2003; Nedwell *et al.,* 2007). As the area of the proposed works is within a Port, these noise levels could be greater than those currently estimated for the whole UK during times where there are increased vessel movements. Specifically, elevated underwater noise emissions have the potential to disturb and injure marine receptors.

Dredging vessels are typically a source of low frequency, non-impulsive, continuous underwater noise, and as such, baleen whales could be more at risk than other taxa (Todd *et al.,* 2015). Underwater noise arising from the dredge vessel and dredging activities is not anticipated to be a major noise source however, and as aforementioned in Section 5.1.2, baleen whales are unlikely to be present in the Port of Inverness area.

Any underwater noise arising within the navigational channels at the mouth of the River Ness will quickly attenuate due to the shallow nature of the works. In addition, where maintenance dredge works are undertaken by the quaysides in the River Ness channel, the quaysides will act as a barrier to prevent underwater noise from extending far.

As such, underwater noise is not discussed in Section 6: Potential Impacts.

5.6 Marine Navigation

The Central and South Citadel Quays are utilised by the Port of Inverness, most notably as Inverness' primary bulk fuel delivery quay. If navigational access to these quays became restricted, there could be major implications for the Port of Inverness' operations, and the wider bulk fuel supply to Inverness. At the southern extent of the navigable reaches of the River Ness, within the Port's operable boundaries, vessel traffic is limited. No routine traffic passes to the south, with only the commercial vessels berthing at Central or South Citadel Quays under the guidance of the Harbour Pilots likely to be present in the area. Recreational and local vessel users are not expected to be present at these quays but still require good navigational access at the northern end of the dredge area to use the marina facilities.

6 Potential Impacts

Several potential impacts arising from the proposed maintenance dredge and disposal works at the Port of Inverness have been identified and are described in Table 6.1.

Table 6.1: Potential Impacts

Source	Sensitive Receptor	Potential Impacts
Falling material during disposal of dredge material.	Marine Mammals (including qualifying features of the Moray Firth SAC)	The probability of an animal being in the spoil ground, and directly under the spoil disposal vessel at the time of release is extremely low, thus, it is unlikely that an animal would be injured in this way. Regardless, mitigation will be applied (see Section 7). As falling material will be primarily made up of silts, there is the potential to increase sedimentation in the water column. Increased sedimentation could impact on the foraging success of the receptors. Although the material to be dredged is predominantly silt and does not drop out as quickly as materials with high sand/gravel content, the waters within the disposal site are already high in silt content and turbidity can increase due to natural fluctuations in the water environment. As such, any increases will be short-lived and should not impair the foraging success of receptors.
	Ornithology (including qualifying features of the Moray Firth and Inner Moray Firth SPAs)	
	Otter	
Falling material during maintenance dredging works.	Marine Mammals (including the Moray Firth SAC)	The probability of an animal being directly under the plant operating in maintenance dredge works is extremely low, thus, it is unlikely that an animal would be injured as a result of falling material. In addition, falling material has the potential to increase sedimentation in the water column. Increased sedimentation could impact on the foraging success of the receptors at the mouth of the River Ness and the most northernly reaches of the dredge area. Although the material to be dredged is predominantly silt and does not drop out as quickly as materials with high sand/gravel content, the waters within the dredge boundary are already high in silt content and as such, should not impair the foraging success of receptors further. Regardless mitigation is employed in Section 7.
	Ornithology (including the Moray Firth and Inner Moray Firth SPAs)	
	Otter	
	Atlantic salmon	Short-term increases in siltation levels have been shown to decrease foraging, territorial and predator avoidance behaviours in juvenile Atlantic salmon (Robertson *et al.*, 2007), whilst erratic swimming behaviours associated with avoidance response (i.e. attempts to

Source	Sensitive Receptor	Potential Impacts
		avoid increased siltation in the water column) increased (Waters, 1995; Robertson *et al.*, 2007). Mitigation is employed in Section 7.
	Air Quality	No dust is expected to arise during the proposed maintenance dredge works, as all work will be undertaken in water and any falling material will be wet.
Accidental spill of fuel oil/diesel and hydraulic fuels and oils – also related to machinery faults.	Marine Mammals (including the qualifying features of the Moray Firth SAC)	Accidental releases of hazardous materials depending on where it occurs can impact upon land and/or water quality with knock on ecological implications if not dealt with promptly. Pollution prevention measures, and spill management plans are therefore required as discussed in Section 7.
	Ornithology (including the qualifying features of the Moray Firth and Inner Moray Firth SPAs)	
	Otter	
	Atlantic salmon	
	Water Environment	
Disturbance as a consequence of operating/moving vessels.	Otter	Floating plant utilised in dredging, may present a disturbance and/or collision risk to otter and wintering birds designated under the SPAs. Disturbance could cause accidental physical damage or result in death of individuals. Mitigation is employed in Section 7.
	Ornithology	
Habitat removal	Sublittoral muds (EUNIS A5.3)	The proposed maintenance dredging works to maintain navigational channels at the Port of Inverness, will see silts and pockets of blue mussel bed be removed. Where silts are removed, this material can be quickly replaced through non-anthropogenic mechanisms such as fluvial and wave action. As dredging will occur within a river channel and at the mouth of the river, silts will quickly be replaced, so sediment typology will not drastically change in the long-term. Although areas in which the port wish to dredge outwith the River Ness will remove pockets of dense blue mussel bed, other areas of densely
	Sublittoral coarse substrates (EUNIS A5.1)	

Source	Sensitive Receptor	Potential Impacts
	Blue Mussels (EUNIS A2.271)	populated blue mussel bed also exist. These beds are situated to the west, north-west and north of the dredge pockets. Removal of the blue mussel bed should therefore not affect the national status of the PMF (see Appendix 3). In addition, as sediment typology will not change drastically, blue mussel communities could re-colonise areas where they were previously removed (Mainwaring *et al.,* 2014). As densely populated areas of blue mussel bed will remain post-dredging, blue mussels are highly likely to recover quickly in this area.
Introduction of invasive non-native marine species (INNMS).	Water Quality	The introduction of INNMS has the potential to result in severe ecological impacts which, in turn, can result in major costs due to the difficulty in trying to eradicate a species once it has been introduced. Currently at the Port of Inverness, there are no known issues with INNMS (Nall *et al.,* 2015), as the mixing of the freshwater River Ness and the marine Beauly Firth supresses the halocline to deeper depths, preventing their establishment. Irrespective of this, the probability of INNMS should be reduced by ensuring equipment mobilised to facilitate the proposed maintenance dredge is clean and will not risk the introduction of INNMS.
Floating plant movements within the Port of Inverness	Air Quality	Floating plant utilised during the proposed works will not contribute to significantly to current greenhouse gas emissions (GHGs), as the numbers of plant utilised in the works will not significantly increase the numbers of those already operable and utilising the facilities at the Port of Inverness.
Proposed maintenance dredge works	Marine Navigation	Additional vessels operating in the area may adversely affect the safety of water users during the proposed works. Mitigation is identified within Section 7.
General Construction Activities giving rise to waste	Marine Environment	Waste needs to be managed appropriately to ensure that it does not give rise to litter in the terrestrial or marine environment where it can cause harm. Mitigation is identified within Section 7.

7 Mitigation

Mitigation measures have been identified to minimise environmental impacts during the maintenance dredge works and are collated below in the Schedule of Mitigation (Table 7.1).

Table 7.1: Schedule of Mitigation

Topic	Mitigation Measures/Enhancement
Marine Mammals	• During dredge disposal, a 200m mitigation zone will be established around the disposal vessel during material disposal. Prior to disposal, a check will be required to ensure there are no animals within a 200m radius of the vessel. A mitigation zone is placed around the vessel as opposed to the disposal site as the vessel will be in transit during disposal. If marine mammals are observed in this area, then disposal operations shall be ceased until the area has been clear for at least 20 minutes. • A formal log of marine mammal sightings will be kept, the log should contain the name of the observer, time of disposal, start and finish times of observations and any action taken, if required.
Ornithology	• Works will be conducted in the months of July – September, avoiding the season in which wintering birds designated under the SPA's are present.
Otter	• Works will be carried out during day light hours where practical. • Vessel speed limit and fixed direction to be followed to minimise chance of disturbance and/or collision.
Atlantic salmon	• The dredging period will be July – September to avoid the Salmon spawning season (October – April) and downstream movement of smolts (March – June). • Any requirement for an extension to this period will require local consultation with the District Salmon Fisheries Board and the Ness Fisheries Board.
Water Quality – silty water.	• Due to the nature of the material to be dredged, silty water will be an issue and if required, additional mitigation deployed. The additional mitigation methods that may be deployed may include: o Specific dredge techniques which allow the material to settle within the bucket of a backhoe dredge (if used) prior to removal from the water.
Fuel/Oils and Hazardous Substances	• Fuel storage should be under strict management controls. • Fuel storage on site will be locked when not in use. • Refuelling should be carried out by trained operatives following site refuelling procedures. • Where practicable, bio-degradable hydraulic fluids will be utilised in machinery during maintenance dredge works. • All oils and chemicals will be subject to Control of Substances Hazardous Health (COSHH) assessments under the COSHH Regulations 2002. • All COSHH assessments will include a section on the environment to highlight and specific precaution or mitigation requirements relevant to the maintenance dredge works. • Appropriately bunded oil and chemical storage cabinets will be provided on all floating plant and will be under management control to ensure appropriate use and accountability. • The dredge contractor will be required to align to the Port of Inverness' spill plans and spill kits will be in place with operatives trained in the use of spill plans and use of spill kits.
Waste/Litter	• Good housekeeping on all floating plant will be employed during the works. • Plant operatives will be made aware that littering will not be tolerated. • The use of single use plastics will be discouraged.
In-Air Noise	• Recommended simple noise control measures implemented as a method of best practice, following guidance from 'BS5228:2009 Noise and vibration control on construction and open sites': o Dredge works will be caried out in daylight avoiding night time hours.

Topic	Mitigation Measures/Enhancement
	○ Plant will be shut down between work periods or throttled down to a minimum. ○ Regular maintenance of all equipment used on site will be conducted, including maintenance related to noise emissions.
Marine Navigation	• All vessels operating in the area will be under direction of the Port of Inverness Harbour Master. • A notice to mariners will be issued, with specific regard to the local angling club and to local tour boat operators. • Dredge/disposal vessels will adhere to a fixed route, speed and direction when carrying out its operations. This will be done as far as practicably possible with regards to tidal and weather requirements.

8 Summary

Port of Inverness require to undertake maintenance dredge works at the ports quaysides in the River Ness channel and in the navigational approaches to the Port of Inverness. The maintenance dredge works are viewed as pertinent to ensuring navigational safety into the harbour area. Due to the location of the works, it is recognised that they could give rise to disturbance and negatively impact upon the environment. Potential issues associated with the works have been identified and the appropriate mitigation has been identified and proposed to minimise negative effects on stakeholders and the environment.

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10 Glossary

Acronym	Definition
AA	Appropriate Assessment
BPEO	Best Practicable Environmental Option
BTO	British Trust of Ornithology
CD	Chart Datum
COSHH	Control of Substances Hazardous Health assessments under the COSHH Regulations 2002
EPS	European Protected Species
GBRs	General Binding Rules
GENs	General Planning Principles
ha	Hectares
HRA	Habitat Regulations Appraisal
JNCC	Joint Nature Conservation Committee
km	kilometres
LNR	Local Nature Reserves
LSE	Likely Significant Effect
m	Metres
m^2	Metres-squared
m^3	Metres-cubed
MHWS	Mean High Water Springs

Acronym	Definition
MS-LOT	Marine Scotland Licensing Operations Team
NCSA	Nature Conservation (Scotland) Act 2004
NM	Nautical Miles
NMP	Scottish National Marine Plan
PSD	Particle Size Distribution
SAC	Special Areas of Conservation
SCOS	Special Committee on Seals
SEPA	Scottish Environment Protection Agency
SNH	Scottish Natural Heritage
SPA	Special Protection Areas
SSSI	Special Sites of Scientific Interest
WCA	Wildlife and Countryside Act 1981

Appendix 1: HRA Report

Habitat Regulations Appraisal Pre-Screening Report

Port of Inverness – Maintenance Dredge Works

Date: 07/02/2022

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Document Control

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Contents

1 Introduction

In support of the Marine Licence Application for Dredge and Sea Disposal for the proposed maintenance dredge works at the Port of Inverness, this Habitats Regulations Appraisal (HRA) Pre-Screening Report provides information required for the competent authority to carry out an HRA, and, where required, an Appropriate Assessment (AA).

This report is designed to be read in conjunction with the Environmental Supporting Document, and directs the reader to the sections of the Environmental Supporting Document which are relevant to the designated site or qualifying features being discussed in this HRA.

1.1 Legislative Basis

A HRA is required for this development due to its proximity to multiple Natura 2000 sites. These include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The legislative context for this requirement is based on Article 6(3) of the Habitats Directive (92/43/EEC), Article 4(4) of the Birds Directive (2009/147/EC) and is implemented in Scotland through The Conservation (Natural Habitats, &c Regulations 1994 (the Habitats Regulations).

In Scotland, the Scottish Planning Policy document ensures that Ramsar sites, which are normally included in an HRA assessment, overlap with Natura sites, and are therefore protected under the same legislation. Therefore, Ramsar sites do not need consideration separately, as part of this HRA Screening report.

If a likely significant effect is predicted on a Natura Site at the first stage of the HRA, then an AA must then be carried out. The AA must demonstrate that the proposal will not adversely affect the integrity of the site (NatureScot, 2021a).

It is the responsibility of the competent authority to carry out the HRA based on robust, scientific information provided by the project developer about the proposed project. It is not the role of the developer to make an assessment on whether the proposal will have an adverse effect on any associated Natura sites.

1.2 Terminology

The terminology employed as part of the HRA process relates to LSEs. The use of the word 'significant' relates to potential ecological connectivity. Assessment of LSEs take a precautionary approach and ask whether a project may have an effect, or have the possibility of having an effect, on a Natura site (NatureScot, 2021b). A project component is said to have an LSE on a designated site if there is ecological connectivity with the site's qualifying interests, or where there is the potential for the conservation objectives of the designated site to be undermined. Where an LSE "*cannot be excluded, on the basis of objective information*" (European Court of Justice C-127/02, 2004) an AA is required. The conservation objectives of the site provide the framework for considering the potential for LSEs.

1.3 Objectives

The objectives of this HRA Pre-Screening report are to summarise:

- The proposed development details;

- The Natura 2000 sites considered, with reference to the Port of Inverness maintenance dredge works, along with these sites' qualifying interests and conservation objectives; and
- Details on the qualifying interests for each of the scoped-in Natura sites.

This information will aid the competent authority in carrying out a HRA. This HRA Pre-Screening Report provides a reference as to where the relevant information required to complete the HRA is located within the Environmental Supporting Document. As such, the HRA should be read in conjunction with the Environmental Supporting Document and not as a stand-alone document. An indication of whether LSEs are expected is given for each designated site, but it is ultimately up to the competent authority carrying out the HRA to ascertain whether LSEs are present, and therefore whether an AA is needed for each designated site.

2 Project Summary

The Port of Inverness is located on the east coast of Scotland, at Inverness, Highland Council area, at the mouth of the River Ness (Grid Reference: NH 66130 46957). As part of the maintenance dredge works, pocketed sections of the River Ness channel will be dredged at the South Citadel Quay (Grid Reference: NH 66376 46249), the Central Longman (Grid Reference: NH 66024 46605) and North Longman (Grid Reference: NH 66080 47006) Quays and an area outwith the mouth of the River Ness (Grid Reference: NH 66051 47333).

Dredging and disposal will only be carried out during daylight hours, and will be undertaken between the months of July – September, starting in 2022. Dredging operations will most likely utilise a backhoe dredger upon a stationary vessel, and the material will be disposed of through bottom dumping only. Bottom dumping vessels transferring material from the dredge site to the disposal site will be required to adhere to a fixed route, speed and direction.

The first year of the maintenance dredge works will remove areas of material which are above the required operational depths within the Port of Inverness harbour area. These proposed dredge areas combined, as shown by the striped areas denoted in Drawing 2021-321C, will comprise an area of approximately 10,039m^2, with 3,282m^3 of material expected to be removed.

Maintenance dredges in the River Ness channel will be carried out in subsequent years as required to remove any build-up of material above operational depths to ensure safe navigation is maintained. It is however, recognised that any accumulation of materials are likely to be in similar areas to those identified in Drawing 2021-321C due to water and vessel movement patterns being relatively consistent.

The aim of the proposed maintenance dredge works are to ensure safe navigational access to the Port of Inverness quaysides and marina. By ensuring safe navigational access, the Port of Inverness can continue to operate commercially and provide a facility for commercial and recreational users.

3 Designated Sites

The designated sites and their qualifying interests relevant to the proposed maintenance dredge works at the Port of Inverness are shown in Table 3.1. The sites, or species within the

sites, are scoped in or out depending on the level of ecological connectivity to the proposed works. A reduced list of designated sites and features is then taken forward for further assessment. Explanations for why certain sites or qualifying features are excluded is laid out in Section 3.1.

No terrestrial SACs or SPAs which were designated for immobile features were considered in Table 3.1, as all the proposed works will be within the marine environment and hence LSE are not expected.

Table 3.1: Designated Sites Relevant to the Proposed Maintenance Works at the Port of Inverness

Designated Site	Distance and Direction	Qualifying Feature(s)	Included in Further Assessment?
Moray Firth SAC	Within the SAC	Bottlenose dolphin (Tursiops truncatus), **Favourable maintained**; Subtidal sandbanks, **Favourable maintained**	YES (for bottlenose dolphins only) - Potential for maintenance dredge works to impact on the qualifying feature of bottlenose dolphin of the SAC due to the mobile nature of the qualifying feature and the proximity between the development area and SAC.
Moray Firth SPA	< 0.1km from W through to NE	Common scoter (Melanitta nigra), non-breeding, **Condition not assessed**; Eider (Somateria mollissima), non-breeding, **Condition not assessed**; Goldeneye (Bucephala clangula), non-breeding, **Condition not assessed**; Red-breasted merganser (Mergus serrator), non-breeding, **Condition not assessed**; Red-throated diver (Gavia stellata), non-breeding, **Condition not assessed**; Scaup (Aythya marila), non-breeding, **Condition not assessed**; Shag (Phalacrocorax aristotelis), breeding, **Condition not assessed**; Slavonian grebe (Podiceps auritus), non-breeding, **Condition not assessed**;	YES - Potential for maintenance dredge works to impact on the qualifying ornithology features of the SPA due to the mobile nature of the qualifying feature and the proximity between the development area and SPA.

Designated Site	Distance and Direction	Qualifying Feature(s)	Included in Further Assessment?
		Velvet scoter (Melanitta fusca), non-breeding, **Condition not assessed**	
Inner Moray Firth SPA	~5.0 km W & ~2.9 km E & ~5.1 km N	Bar-tailed godwit (Limosa lapponica), non-breeding, **Favourable Condition**; Common tern (Sterna hirundo), breeding, **Unfavourable No Change**; Cormorant (Phalacrocorax carbo), non-breeding, **Unfavourable No Change**; Curlew (Numenius arquata), non-breeding, **Favourable Condition**; Goldeneye (Bucephala clangula), non-breeding, **Favourable Condition**; Goosander (Mergus merganser), non-breeding, **Unfavourable No Change;** Greylag goose (Anser anser), non-breeding, **Favourable Condition**; Osprey (Pandion haliaetus), breeding, **Favourable Condition**; Oystercatcher (Haematopus ostralegus), non-breeding, **Favourable Condition**; Red-breasted merganser (Mergus serrator), non-breeding, **Favourable Condition**; Redshank (Tringa penelop), non-breeding, **Favourable Condition**; Scaup (Aythya marila), non-breeding, **Favourable Condition**; Teal (Anas crecca), non-breeding, **Favourable Condition**; Waterfowl assemblage, non-breeding, **Favourable Condition**; Wigeon (Anas penelope), non-breeding, **Favourable Condition**	YES – The qualifying features have been sighted within 5 km of the proposed maintenance dredge area. However, the features designated under this site are also designated under the Moray & Nairn Coast SPA. As the two sites share qualifying features, it is unclear whether qualifying features sighted within 5 km of the proposed maintenance dredge area are from one designated site or the other. Thus, this site is taken forward for collective assessment with the Moray & Nairn Coast SPA.

Designated Site	Distance and Direction	Qualifying Feature(s)	Included in Further Assessment?
Loch Ashie SPA	~11.1 km S	Slavonian grebe (Podiceps auritus), breeding, **Favourable maintained**	YES – Slavonian Grebe have been sighted within 5 km of the proposed maintenance dredge area. Although it is unclear that the Slavonian Grebe sighted close to the proposed works are those from the Loch Ashie SPA, it is possible that this species could use both the Loch Ashie SPA and the Moray Firth SPA which is situated closer to the proposed works and also designated for Slavonian grebe. Thus, to be conservative, it is assumed that there is the potential for some degree of connectivity to occur between the Loch Ashie SPA and the proposed works.
Loch Ruthven SPA	~18.5 km S	Slavonian grebe (Podiceps auritus), breeding, **Favourable maintained**	YES – Slavonian Grebe have been sighted within 5 km of the proposed maintenance dredge area. Although it is unclear that the Slavonian Grebe sighted close to the proposed works are those from the Loch Ruthven SPA, it is possible that this species could use both the Loch Ruthven SPA and the Moray Firth SPA which is situated closer to the proposed works and designated for Slavonian grebe. Thus, to be conservative, it is assumed that there is the potential for some

Designated Site	Distance and Direction	Qualifying Feature(s)	Included in Further Assessment?
			degree of connectivity to occur between the Loch Ruthven SPA and the proposed works.
Loch Ruthven SAC	~18.5 km S	Clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels, **Favourable maintained;** Otter (Lutra lutra), **Favourable maintained;**	YES (for otter only) - Otters are wide-ranging and highly mobile. The population at Loch Ruthven SAC is reliant on suitable habitat in the surrounding wider countryside and is unlikely to be viable (capable of functioning) in isolation. As signs of otter have been found, and sightings have been made of otter within the Port of Inverness area, the maintenance dredge works have the potential to impact upon this qualifying feature of the SAC.
Moray & Nairn Coast SPA	~25.9 km NE	Bar-tailed godwit (Limosa lapponica), non-breeding, **Unfavourable declining**; Dunlin (Calidris alpina alpina), non-breeding, **Favourable maintained**; Greylag goose (Anser anser), non-breeding, **Unfavourable declining**; Osprey (Pandion haliaetus), breeding, **Favourable maintained**; Oystercatcher (Haematopus ostralegus), non-breeding, **Favourable maintained**; Pink-footed goose (Anser brachyrhynchus), non-breeding, **Unfavourable declining**; Red-breasted merganser (Mergus serrator), non-breeding, **Favourable maintained**;	YES – The qualifying features of this site have been sighted within 5 km of the proposed maintenance dredge area. However, the qualifying features designated under this site (with the exception for dunlin) are also designated under the Inner Moray Firth SPA. As the two sites share qualifying features, it is unclear whether qualifying features sighted within 5 km of the proposed maintenance dredge area are from one site or the other. Thus, this site has been taken

Designated Site	Distance and Direction	Qualifying Feature(s)	Included in Further Assessment?
		Redshank (Tringa totanus), non-breeding, **Unfavourable declining**; Waterfowl assemblage, non-breeding, **Favourable declining**; Wigeon (Anas penelope), non-breeding, **Favourable maintained**	forward for collective assessment with the Inner Moray Firth SPA.
North Inverness Lochs SPA	~27.2 km SE	Slavonian grebe (Podiceps auritus), breeding, **Favourable maintained**	YES – Slavonian Grebe have been sighted within 5 km of the proposed maintenance dredge area. Although it is unclear that the Slavonian Grebe sighted close to the proposed works are those from the North Inverness Lochs SPA, it is possible that this species could use both the North Inverness Lochs SPA and the Moray Firth SPA which is situated closer to the proposed works and designated for Slavonian grebe. Thus, to be conservative, it is assumed that there is the potential for some degree of connectivity to occur between the North Inverness Lochs SPA and the proposed works.
River Moriston SAC	40.1 km SW by sea	Atlantic salmon (*Salmo salar*), **Unfavourable No change**; Freshwater pearl mussel (*Margarritifera margaritifera*), **Unfavourable No change**	YES – for Atlantic salmon only.

3.1 Reasons for Designated Sites or Species Exclusions

No terrestrial SACs designated for immobile features only (i.e., woodland, bog, moorland) were considered in Table 3.1, as all the proposed works will be within the marine environment.

However, terrestrial sites which were designated for their mobile features were considered. For example, the Loch Ruthven SAC is excluded from assessment for its 'clear-water lakes or lochs with aquatic vegetation and poor to moderate nutrient levels', but included for otter.

None of the sites considered for assessment in Table 3.1 were excluded for their mobile features.

3.2 Designated Site Information – For Assessment

The Environmental Supporting Document provides baseline information on designated sites and their qualifying features within 10km of the proposed development. Where this information has been provided in the Environmental Supporting Document (see Sections 5.1.2 and 5.1.3 of the Environmental Supporting Document), it has not been repeated in this HRA (Sections 3.2.1 – 3.2.3). Where baseline information on a designated site was not provided in the Environmental Supporting Document, it has been provided here (Sections 3.2.4 – 3.2.6).

The Conservation Objectives of each of the designated sites taken forward is provided under each designated site section. Information on where the assessment for the qualifying features or species for each site is then provided. Sites which were designated for Slavonian grebe only were assessed collectively, as the potential impacts on the qualifying feature of Slavonian grebe for each site will be the same. In addition, qualifying features designated under the Moray & Nairn Coast SPA (with the exception of dunlin) are also designated under the Inner Moray Firth SPA, and as such, these sites were also assessed collectively.

3.2.1 Moray Firth SAC

The conservation objectives for the Moray Firth SAC are shown in Table 3.2

With mitigation in place (Section 7 of the Environmental Supporting Document), no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the qualifying interests of the designated sites are not present in the vicinity of works at the time of construction.

A summary of the LSE considerations without mitigation however, are provided in Table 3.3 below.

A degree of connectivity has been identified between the Moray Firth SAC and the proposed development works due to the highly mobile nature of the site's qualifying feature of bottlenose dolphin, and the proximity of the works to the boundary of the SAC. This, combined with the techniques likely to be utilised during proposed maintenance dredge works, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.2 Moray Firth SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (Bottlenose dolphin, *Tursiops truncatus*) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained, and the site makes an appropriate contribution to achieving favourable conservation status for the qualifying interest.	Section 5.1.1: Designated Sites & 5.1.2: Marine Mammals

Further Conservation Objective: To ensure for the qualifying species that the following are established then maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within the site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; and • No significant disturbance of the species.	Section 6: Potential Impacts Section 7: Mitigation

Table 3.3 Moray Firth SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Bottlenose dolphin (*Tursiops truncatus*)	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to bottlenose dolphin designated under the SAC. A small section of the proposed maintenance dredge works are situated within the designated site, and increased sediment suspension could arise within the SAC during dredging. Bottlenose dolphins use echolocation to find, track and intercept individual prey items (Nowacek, 2005; Hastie et al., 2006) and it is therefore unlikely that increased sedimentation will impair their foraging abilities within or adjacent to the SAC. Dredging activity is likely to be carried out from floating plant. However, due to the scale of the works, it is unlikely that there will be increased vessel numbers beyond those already operable at the Port of Inverness for maintenance dredge works. As such, it is unlikely that there would be any significant increase in ambient underwater noise levels or increased risk of ship strikes due to increased vessel traffic densities experienced in the area. As floating plant in the marine environment will be utilised, pollutants released into the water as a result of the release of hydraulic oils or fluids from dredge vessels and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on bottlenose dolphins, including fatality. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect large areas of the designated site and indeed its qualifying features. The disposal ground for the dredge material is wholly situated within the designated site. There is a risk of injury to bottlenose dolphin during disposal itself as a result of falling material. In addition, disposal vessel movements to and from the disposal site could pose an additional risk of ship strikes. As vessel movements during disposal will not increase significantly beyond those already operable within the SAC, such impacts are unlikely but could have detrimental effects on bottlenose dolphin. Without mitigation, LSE cannot be ruled out for vessel collisions or falling material, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to bottlenose dolphins designated under the SAC.

3.2.2 Moray Firth SPA

The conservation objectives for the Moray Firth SPA are shown in Table 3.3.

With mitigation in place, no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the qualifying interests of the designated sites will not be physically harmed by construction activities or subject to significant disturbance, as such the conservation objectives of the SAC are unlikely to be impacted.

A summary of the LSE considerations on the qualifying features without mitigation however, are shown in Table 3.4 below.

A degree of connectivity has been identified between the Moray Firth SPA and the proposed development works due to the highly mobile nature of the site's qualifying ornithology features, and the proximity of the works to the boundary of the SPA. LSE are not expected for the qualifying species and therefore it is unlikely that an AA will need to take place.

Table 3.3 Moray Firth SPA Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long-term and it continues to make an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species.	Section 5.1.1: Designated Sites & 5.1.3: Ornithology
Further Conservation Objective: This contribution will be achieved through delivering the following objectives for each of the site's qualifying features: • Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term; • To maintain the habitats and food resources of the qualifying features in favourable condition.	Section 6: Potential Impacts Section 7: Mitigation

Table 3.4 Moray Firth SPA Qualifying Features

Qualifying Feature	Summary of Assessment
All features designated under the SPA	The Moray Firth is an important spawning ground and nursery area for a number of fish species, which together with abundant bivalve molluscs, are important prey species for the qualifying bird species designated under the Moray Firth SPA. The qualifying features using the site require sufficient food resource to be available and eat a variety of pelagic and benthic prey. In addition, significant disturbance can include displacement and barrier effects on the species. Where such disturbance is brought about by human activities which affect the qualifying species' distribution and use of the site, such that their ability to survive and/or breed is compromised in the long-term, it is considered significant. In the absence of mitigation procedures, there is

	potential to cause minor disturbance to the foraging pathways of ornithology features designated under the SPA during maintenance dredge works. A small section of the proposed maintenance dredge works are situated < 0.1km from the designated site in westerly to north-easterly directions. As such, increased sediment suspension could arise within the SPA during dredging. Although increased sediment suspension in the water column is likely during dredge and disposal works, which could inhibit foraging success of the qualifying features and cause them to avoid affected areas (Todd *et al*., 2015; Lunt & Smee, 2015), turbidity can increase due to natural fluctuations in the water environment, and as such, sedimentation increases due to the disposal of dredge material should not impair the foraging success of receptors further. In addition, bivalve prey items of the ornithological features are filter-feeders and effectively remove natural suspended matter (Gallardi, 2014). Increases in sedimentation are therefore unlikely to impact on the prey items of the qualifying features. As such, LSE are not anticipated to occur on the habitats and food resources of the qualifying features. As floating plant in the marine environment will be utilised, pollutants released into the water as a result of the release of hydraulic oils or fluids from dredge vessels and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on the ornithology designated under the SPA. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect large areas of the designated site, the wider supporting habitat and the prey items important to the designated sites qualifying features. As works will be undertaken between the months of July – September, increased floating plant movements, including vessels, travelling to and from the maintenance dredge area and disposal site during maintenance dredge works will not lead to increased disturbance of over-wintering ornithology features. LSE are unlikely when taking into consideration the likelihood of exposure to new pollution indices, impacts on habitat and/or food resources.

3.2.3 Inner Moray Firth SPA and Moray & Nairn Coast SPA

The conservation objectives for the Inner Moray Firth SPA and Moray & Nairn Coast SPA are shown in Table 3.5.

With mitigation in place, no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the qualifying interests of the designated sites will not be physically harmed by construction activities or subject to significant disturbance, as such the conservation objectives of the SAC are unlikely to be impacted.

A summary of the LSE considerations on the qualifying features without mitigation however, are shown in Table 3.6 below.

A degree of connectivity has been identified between the Inner Moray Firth SPA and Moray & Nairn Coast SPA and the proposed development works due to the highly mobile nature of the site's qualifying ornithology features. LSE are not expected for the qualifying species and therefore it is unlikely that an AA will need to take place.

Table 3.5 Inner Moray Firth SPA and Moray & Nairn Coast SPA Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained.	Section 5.1.1: Designated Sites & 5.1.3: Ornithology
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species	Section 6: Potential Impacts Section 7: Mitigation

Table 3.6 Inner Moray Firth SPA and Moray & Nairn Coast SPA Qualifying Features

Qualifying Feature	Summary of Assessment
All features designated under the SPA	The Moray Firth is an important spawning ground and nursery area for a number of fish species, which together with abundant bivalve molluscs, are important prey species for the qualifying bird species designated under the Inner Moray Firth SPA. The qualifying features designated under the Inner Moray Firth are also designated under the Moray & Nairn Coast SPA, which provides a similar habitat to that of the Inner Moray Firth. The qualifying features at each designation require sufficient food resource to be available and eat a variety of pelagic and benthic prey. Where disturbance is brought about by human activities which affect the qualifying species' distribution and use of the site, such that their ability to survive and/or breed is compromised in the long-term, it is considered significant. In the absence of mitigation procedures, there is potential to cause minor disturbance to the foraging pathways of ornithology features designated under each SPA during maintenance dredge works. Even though the proposed maintenance dredge works will not impact upon the Moray & Nairn Coast SPA directly, the qualifying features of this SPA could be found within the proposed works area, just as they are also found in the Inner Moray Firth SPA. Although increased sediment suspension in the water column is likely during dredge and disposal works, which could inhibit foraging success of the qualifying features and cause them to avoid affected areas (Todd *et al*., 2015; Lunt & Smee, 2015), turbidity can increase due to natural fluctuations in the water environment, and as such, sedimentation increases due to the disposal of dredge material should not impair the foraging success of receptors further. In addition, bivalve prey items of the ornithological features are filter-feeders and effectively remove natural suspended matter (Gallardi, 2014).

	Increases in sedimentation are therefore unlikely to impact on the prey items of the qualifying features. As such, LSE are not anticipated to occur on the habitats and food resources of the qualifying features. As floating plant in the marine environment will be utilised, pollutants released into the water as a result of the release of hydraulic oils or fluids from dredge vessels and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on the ornithology designated under the SPA. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect large areas of the designated site, the wider supporting habitat and the prey items important to the designated sites' qualifying features. As works will be undertaken between the months of July – September, increased floating plant movements, including vessels, travelling to and from the maintenance dredge area and disposal site during maintenance dredge works will not lead to increased disturbance of over-wintering ornithology features. LSE are unlikely when taking into consideration the likelihood of exposure to new pollution indices, impacts on habitat and/or food resources.

3.2.4 Loch Ashie, Loch Ruthven & North Inverness Lochs SPAs

The conservation objectives for the Loch Ashie, Loch Ruthven & the North Inverness Lochs SPAs are shown in Table 3.7.

A total of 358 sightings of Slavonian grebe were made within 5 km of the proposed maintenance dredge works between 2016 and 2019 (NBN Atlas, 2021). Although Slavonian grebe are designated under the Moray Firth SPA which is within 5 km of the proposed works, it cannot be guaranteed that individuals sighted do not also utilise the Loch Ashie, Loch Ruthven and the North of Inverness Lochs SPAs. As such, they have been considered for assessment here.

Loch Ashie SPA supports approximately 15% of the UK's population of Slavonian grebe, with a maximum population size of ~ 60 individuals (JNCCa, 2018). By comparison, the Loch Ruthven and North Inverness Lochs SPAs population counts identified ~ 14 individuals (JNCCb, 2018) and ~ 7 individuals (JNCCc, 2018) respectively, although these were rough estimates and constituted in poor data quality.

Nonetheless, with mitigation in place, no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the qualifying interests of the designated sites will not be physically harmed by construction activities or subject to significant disturbance, as such the conservation objectives of the SAC are unlikely to be impacted.

A summary of the LSE considerations on the qualifying features without mitigation however, are shown in Table 3.8 below.

A degree of connectivity has been identified between the Loch Ashie, Loch Ruthven and North Inverness Lochs SPAs and the proposed development works due to the highly mobile nature of the site's qualifying ornithology features. LSE are not expected for the qualifying species and therefore it is unlikely that an AA will need to take place.

Table 3.7 Loch Ashie, Loch Ruthven & the North Inverness Lochs SPAs Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained	Baseline information provided above.
Further Conservation Objective: To ensure for the qualifying species that the following are maintained in the long term: • Population of the species as a viable component of the site; • Distribution of the species within site; • Distribution and extent of habitats supporting the species; • Structure, function and supporting processes of habitats supporting the species; • No significant disturbance of the species.	Section 6: Potential Impacts Section 7: Mitigation

Table 3.8 Loch Ashie, Loch Ruthven & the North Inverness Lochs SPAs Qualifying Feature

Qualifying Feature	Summary of Assessment
Slavonian grebe (*Podiceps auritus*)	As floating plant in the marine environment will be utilised, pollutants released into the water as a result of the release of hydraulic oils or fluids from dredge vessels and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on Slavonian grebe designated under these SPAs. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect large numbers of the qualifying features. Increased floating plant movements, including vessels, travelling to and from the maintenance dredge area and disposal site during maintenance dredge works, may lead to increased disturbance of Slavonian grebe. However, vessel movements during maintenance dredge works and disposal will not increase significantly beyond those already operable at the Port of Inverness, and as such, displacement of Slavonian grebe outwith their designations is unlikely. The species primarily utilises the vegetated margins of inland freshwater lochs as nesting sites over the summer months hence the locations of the designated sites. Any disturbance effects are unlikely to cause detrimental effects on the viability of breeding Slavonian grebe, as the proposed maintenance dredge area provides unsuitable habitat for breeding. It is therefore assumed that any Slavonian grebe present within the area of the proposed works having vacated the Loch Ashie, Loch Ruthven and the North of Inverness Lochs SPAs, are likely there for foraging purposes only. Although increased sediment suspension in the water column is likely during dredge and disposal works, which could inhibit foraging success of the qualifying features and cause them to avoid affected areas (Todd *et al.*, 2015; Lunt & Smee, 2015), turbidity can increase due to natural fluctuations in the

	water environment, and as such, sedimentation increases due to the disposal of dredge material should not impair the foraging success of receptors further. LSE are unlikely when taking into consideration the likelihood of exposure to new pollution indices, impacts on habitat and/or food resources, and impacts related to disturbance.

3.2.5 Loch Ruthven SAC

The conservation objectives for otter of the Loch Ruthven SAC are shown in Table 3.9.

Otters are wide-ranging and highly mobile. The population at the Loch Ruthven SAC is reliant on suitable habitat in the surrounding wider countryside and is unlikely to be viable (capable of functioning) in isolation. The home range of an otter will vary depending on their sex, habitat quality and food availability, but is likely to be much larger than this site. Males living in rivers and streams can have a mean linear range size of around 40km and females living in the same habitat can have a linear home range of 20km. These home ranges are comparable to the distance between the area of the proposed maintenance dredge works and the Loch Ruthven SPA and as such, the otters sighted in and around the Port of Inverness could be associated with Loch Ruthven.

With mitigation in place, no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the otter are unlikely to be physically harmed by construction activities or subject to significant disturbance, as such the conservation objectives of the SAC are unlikely to be impacted.

A summary of the LSE considerations on the qualifying features without mitigation however, are shown in Table 3.10 below.

A degree of connectivity has been identified between the Loch Ruthven SAC and the proposed maintenance dredge works due to the highly mobile nature of otter. This, combined with the techniques likely to be utilised during proposed maintenance dredge works, means that there is the potential for the works to have an LSE on the site. Therefore, it is likely an AA will be required.

Table 3.9 Loch Ruthven SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To ensure that the qualifying feature of Loch Ruthven SAC (Otter, *Lutra lutra*) is in favourable condition and make an appropriate contribution to achieving favourable conservation status.	No baseline in supporting document. Provided above.
Further Conservation Objective: To ensure that the integrity of Loch Ruthven SAC is maintained by meeting objectives: • Maintain the population of otter as a viable component of the site; • Maintain the distribution of otter throughout the site; • Maintain the habitats supporting otter within the site and availability of food.	Section 6: Potential Impacts Section 7: Mitigation

Table 3.10 Loch Ruthven SAC Qualifying Feature

Qualifying Feature	Summary of Assessment
Otter (*Lutra lutra)*	In the absence of mitigation procedures, there is potential to cause minor disturbance and possible injury to otter designated under the SAC. As floating plant in the marine environment will be utilised, pollutants released into the water as a result of the release of hydraulic oils or fluids from dredge vessels and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on otter, including fatality. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect the qualifying feature of the designated site. It is possible however that otters in the area will enter the maintenance dredge area during periods when dredging works are not ongoing. In this event, it is unlikely that otters will seek shelter in items of floating plant or equipment due to the frequency in which the equipment will be used. However, floating plant utilised in dredging, may present a collision risk to otter. This may result in an increased risk of injury or accidental mortality. Increased floating plant movements, including vessels, travelling to and from the maintenance dredge area and disposal site during maintenance dredge works may lead to increased disturbance of otter. However, vessel movements during maintenance dredge works and disposal will not increase significantly beyond those already operable at the Port of Inverness. Without mitigation, LSE cannot be ruled out for vessel collisions or falling material, despite low likelihood of exposure. LSEs are unlikely when taking into consideration the likelihood of exposure to new pollution indices and LSEs associated with sediment suspension are unlikely. In the absence of mitigation procedures, there is the potential to cause moderate disturbance and possible injury to otter designated under the SAC.

3.2.6 River Moriston SAC

River Moriston SAC is part of the Ness catchment and flows through Glen Moriston, entering the northern side of Loch Ness. The site covers 194 ha and is designated for Atlantic salmon and freshwater pearl mussel. The last assessment identified both designated species to be in an unfavourable condition (SNH, 2019).

Salmon counts through the Dundreggan Dam located on River Moriston showed an increase in salmon from low's during the mid-1970's to the mid 1990's, with salmon count peaking at 377 fish in 2015. Although, catches since 2015 have decreased again, with only 262 fish counted in 2018 (Ness DSFB, 2018).

Surveying of the freshwater pearl mussel population identified a high proportion (40%) of juveniles in River Moriston (JNCC 2019), indicating the freshwater pearl mussel population is viable.

Salmon migrating to and from the marine environment will transit past the proposed works. As such this site is taken forward for assessment, with respect to the Atlantic salmon qualifying feature. Due to the distance between the proposed works and the pearl mussel beds in the River Moriston, there is no potential for this feature to be directly affected. It is acknowledged

that the larval phase of pearl mussels are reliant on the integrity of the salmon population, however, any mitigation provided to reduce impacts on salmon will also reduce impacts on larval pearl mussels, so there is no need to consider this aspect separately.

The Conservation Objectives for the River Moriston SAC are shown in Table 3.11.

With mitigation in place, no effects are anticipated to undermine the conservation objectives of the designated site. It will be ensured that the qualifying interests of the designated sites will not be physically harmed by construction activities or subject to significant disturbance, as such the conservation objectives of the SAC are unlikely to be impacted.

A summary of the LSE considerations on the qualifying features without mitigation however, are shown in Table 3.12 below.

Connectivity has been identified between the Atlantic salmon feature of River Moriston and the proposed works due to the sites qualifying feature migrating past the development site. This, combined with the nature of the maintenance dredge works, means there is the potential for the works to have a LSE on the sites qualifying feature. Therefore, it is likely an AA will be required.

Table 3.11: River Moriston SAC Conservation Objectives

Conservation Objective of the Designated Site	Section of the Environmental Supporting Document to inform the Assessment
Overarching Conservation Objective: To avoid deterioration of the habitats of the qualifying species (listed below) or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features.	No baseline information on the designated site has been provided in the supporting document and as such, has been provided above. Section 5.1.5 of the Environmental Supporting Document provides information on Atlantic salmon only.
Further Conservation objectives: • Population of the species, including range of genetic types for salmon, as a viable component of the site • Distribution of the species within site • Distribution and extent of habitats supporting the species • Structure, function and supporting processes of habitats supporting the species • No significant disturbance of the species • Distribution and viability of freshwater pearl mussel host species • Structure, function and supporting processes of habitats supporting freshwater pearl mussel host species.	Section 6: Potential Impacts Section 7: Mitigation

Table 3.12: River Moriston SAC Qualifying Features

Species/Feature	Summary of Assessment

Atlantic Salmon ***(Salmo salar)***	In the absence of mitigation procedures, there is potential to cause moderate disturbance and possible injury to Atlantic salmon designated under the SAC. Impacts are related to sediment loading and release of hazardous substance. Pollutants released into the water as a result of the release of hydraulic oils or fluids from plant and the spillage of onboard fluids and/or chemicals could have negative, direct or indirect, implications on Atlantic salmon, including fatality. In the unlikely event of a pollution event however, the scale of the event is likely to be too small to affect the qualifying feature of the designated site. Increased sediment suspension in the water column is likely during maintenance dredge works. Short-term increases in siltation levels have been shown to decrease foraging, territorial and predator avoidance behaviours in juvenile Atlantic salmon (Robertson *et al.,* 2007), whilst erratic swimming behaviours associated with avoidance response (i.e. attempts to avoid increased siltation in the water column) increased (Waters, 1995; Robertson *et al.,* 2007). Where sediment plumes arise, these are anticipated to be small, localised and short-lived as sediments will quickly disperse/drop-out in the shallow waters. The mobile nature of adult salmon also means they can avoid sediment plumes if they are present in the area, however during the smolt run, young salmon follow the coastline. In these instances, young salmon may be impacted upon by sedimentation causing behavioural changes. As the maintenance dredge works will be undertaken in the months of July – September, avoiding both the adult salmon and smolt run seasons. This assessment therefore finds increased sediment loading is unlikely to result in disturbance and the behavioural responses of Atlantic salmon. LSEs associated with increased suspended sediments will therefore be minor.

4 Cumulative & In-Combination Effects

Cumulative and in-combination effects of the proposed maintenance dredge works at the Port of Inverness were assessed as part of the HRA process and were assessed for the following designated sites and their qualifying features:

- Moray Firth SAC (Bottlenose dolphins, *Tursiops truncatus*);
- Moray Firth SPA (Ornithological assemblage);
- Inner Moray Firth and the Moray & Nairn Coast SPAs (Ornithological assemblage);
- Loch Ashie, Loch Ruthven and the North Inverness Lochs SPAs (Slavonian grebe, *Podiceps auritus*);
- Loch Ruthven SAC (Otter, *Lutra lutra*);
- River Moriston SAC (Atlantic salmon, *salmo salar*).

Numerous current and prospective projects/developments of various sizes, and with varying timescales, have been identified within the Moray Firth area which could lead to cumulative and/or in-combination effects. When considering the scale of the maintenance dredge works however, and the techniques that will be employed during dredge and disposal, it has been

identified that it is unlikely that these works will contribute to any in-combination effects for any of the receptors identified as part of this HRA.

5 Conclusion

There are no predicted residual, adverse impacts for any of the qualifying features of the designated sites assessed as part of this HRA. The proposed maintenance dredge works are unlikely to contribute to in-combination effects when comparing the scale of the works to other proposed/current projects in the Moray Firth. Information from this report can be used by the competent authority, in conjunction with the relevant sections of the Environmental Supporting Document, as identified in this report, to carry out the HRA and any necessary AAs. It will be up to the competent authority to ascertain whether the proposal will adversely affect the integrity of the designated sites to be considered.

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7 Glossary

Acronym	Definition
AA	Appropriate Assessment
E	East
EIAR	Environmental Impact Assessment Report
HRA	Habitats Regulations Appraisal
JNCC	Joint Nature Conservation Committee
km	Kilometre
LSE	Likely Significant Effects
N	North
NBN	National Biodiversity Network
NE	Northeast
S	South
SAC	Special Areas of Conservation
SE	Southeast
SPA	Special Protections Areas
W	West

Appendix 2: 2019 Otter Survey Report

Port of Inverness

Otter Survey March 2019

For:

Inverness Harbour Trust

Prepared by: Innes Beaton

Date:22/05/2019

Document Control

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Revision No:	Signature	Comments	Date
1	*I Beaton*	Issue 1	22/05/2019

Contents

1 Introduction

Affric Limited were commissioned to undertake an ecological survey focusing on the Eurasian otter *Lutra lutra*, within the Port of Inverness and the adjacent River Ness.

The survey is required to provide information to determine the extent and nature of otter utilisation of the area. This is required in order to inform an assessment of potential impacts on otter resulting from the Shore Street Quay remedial works, and other future developments of the Port of Inverness.

1.1 Objectives of Study

This report seeks to document the likely presence or absence of otter within the survey area, and if otters are present, outline how otters are using the area. Otters are afforded some level of protection under Scottish and U.K. law.

The report details the results of the survey with the following details:

- Site description;
- Legislative context;
- Field survey methodology;
- Field survey results; and
- Discussion.

2 Legislative Context

The otter is a European Protected Species (EPS) and is protected under regulation 45 of the Conservation (Natural Habitats and Species.) Regulations 1994 (as amended) in Scotland which transpose into Scottish law the European Community's Habitats Directive (92/43/EEC). This means that it is an offence to:

- Deliberately or recklessly capture, injure or kill, harness, damage or destroy a breeding site or resting place of an otter or a group of otters;
- Disturb an otter while it is occupying a structure or place which it uses for shelter or protection;
- Disturb an otter while it is rearing or otherwise caring for its young;
- Obstruct access by an otter to a breeding or resting place;
- Disturb an otter in a manner that is, or circumstances which are, likely to significantly affect the local distribution or abundance of that species; and,
- Disturb an otter in a manner that is, or in circumstances which are likely to impair its ability to survive, breed or reproduce, or rear or otherwise care for its young.

In addition to the above, otter is listed in the Scottish Biodiversity List and the UK Biodiversity Action Plan (BAP). They are also listed in the Inverness & Nairn BAP in which they are listed as an individual species.

3 Site Description

The Port of Inverness, centred on the grid reference NH66239 46662, is located within the northern seaward limits of the city of Inverness. The area is industrial in nature, and provides berthing, laydown, bunkering, and logistical facilities to commercial shipping. The laydown

areas and transport routes within the Port of Inverness area surfaced with a mixture of concrete slab, laid tarmac and block paving, with the sea facing areas constructed of sheet piled quayside, and rock armoured revetments.

An area immediately to the north of the Port is designated as the Moray Firth Special Area for Conservation and proposed Special Protected Area. 2.4km to the west lies the Beauly Firth Site of Special Scientific Interest (SSSI) and 2.8kn to the east is the Longman & Castle Stuart Bays SSSI. The SSSIs also designated as the Inner Moray Firth Special Protected Area and Ramsar site, however, none of these designations include otter as a qualifying feature. It is noted that the Merkinch Local Nature Reserve is located 1km to the west of the Port of Inverness, and this site is noted for the presence of otters.

4 Methodology

The Survey was undertaken on 20th March 2019 by Innes Beaton, a suitably qualified and experienced otter surveyor. The weather was dry, overcast, 10°C with a light westerly wind, there had been no rain for 4 days prior to survey. All accessible areas within the survey area (Drawing 59.AA), were examined during the survey.

The otter survey was undertaken in accordance with the approach detailed by Scottish Natural Heritage's 'Otters and Development' guidance document (SNH, 2010), together with the guidance provided in the book, 'Ecology of the European Otter' (Chanin, 2003). The survey covered the quaysides, laydown areas, rock armour revetments, and banks of the River Ness and included a thorough check all recesses for the presence of otters and their resting places including holts and couches.

Due to the often-elusive nature of otters, the survey predominantly relied on the interpretation of field signs rather than direct observation of the animals themselves. During the survey the following field signs were sought, with those which can be regarded as definitive, i.e. they provide certain confirmation of the presence of this species, marked with an asterisk:

- Spraints (faeces); *
- Feeding remains (partially eaten prey items); *
- Holts (den); *
- Footprints; *
- Couches or lay-ups (resting place above ground); and
- Pathways and slides into water.

All evidence identified during the survey was recorded using an iPhone 6S running Ordnance Survey 1:50,000 memory map software, with the features of interest marked, noted and photographed.

4.1 Limitations

The survey was completed at low tide, and in good conditions after a period of dry weather. An appropriate period of time was allowed to conduct the survey in day light hours, as such there were no time constraints on the survey.

There were no areas inaccessible to survey. It was not possible to see within all the crevice's in the rock armour, this however is not deemed to be a significant limitation in this case.

5 Results

5.1 Existing Information

It is not known when the last otter survey was carried out in this area, however otter are known to frequent the area to the west of Carnac Point, South Kessock and beyond. Otters are also regularly observed within the lower reaches of the River Ness.

The survey area borders the mouth of the River Ness where it enters the Beauly Firth and extends upstream to the south for approximately 1.3km along both banks of the river, which is tidal throughout the survey area. The Beauly Firth is a sheltered tidal inlet which will provide significant food sources for otters, and the River Ness is known for being one of the most productive trout and salmon rivers in the north of Scotland, which will provide another significant otter feeding resource.

Other than the piled quay walls of the port, the seaward edges are mainly constructed of rock armour. There is also a marina with 4 finger pontoons, installed within a pile wall basin, which has a rock armoured revetment protecting its seaward limit to the northeast of the North Longman quay. Access to the marina is restricted to its users only. The port also has restricted access; hence the only sources of disturbance is activities carried out within the port itself, very few of which require access to the rock armour.

The western shore of the river ness is of mixed terrain, with low rock revetments at Carnac point and areas of tidal foreshore, a piled quay wall at Gaelforce Marine and further rock armour placements and vegetated banks. There is the possibility of human disturbance to the north and south of Gaelforce marine's compound, and the area is popular with dog walkers and fishermen. The numerous areas of rock armour may provide opportunities for places of shelter and lay-ups.

5.2 Survey Findings

Signs of otter were evident on the rock revetment, which surrounds the Marina entrance and also on the Pilot Boat berth within the marina. Old spraints were noted on the edge of the Longman Quay and the North Citadel quay. More recent sprainting along with feeding remains were noted on the rock armour surrounding the Gaelforce Marine compound. There was no further evidence of otter identified within the survey area.

A summary of the survey results is provided in Table 1 below, and shown on Drawing 59.AA. Photos of the otter signs are provided in Appendix A.

Table 1: Grid Locations of Otter Signs Port of Inverness

Location	Sign	Appendix A Photo No's.	Comments
NH 66174 46641	Old Spraint	1	Longman Quay
NH 66151 47057	Feeding Remains	2, 3, 4	P6 Pilot Boat Pontoon
NH 66359 46354	Spraint	5	North Citadel Quay
NH 66130 47154	Spraint	6	Rock Armour Marina
NH 66138 47209	Spraint	7	Rock Armour Marina
NH 66166 47220	Spraint	8, 9	Rock Armour Marina
NH 66224 47259	Spraint	10, 11	Rock Armour Marina
NH 66187 47244	Spraint & Feeding Remains	12, 13	Rock Armour Marina
NH 66070 46533	Spraint & Feeding Remains	14, 15, 16	Rock Armour Gaelforce
NH 66098 46509	Spraint	17	Spraint on Flood wall

6 Discussion

The survey identified 2 locations within the survey area that appear to be frequently and recently utilised by otters, these are:

- The rock armoured revetment to the north east of the marina; and
- The rock armoured area immediately south of the Gaelforce Marine compound on the western bank of the River Ness.

The rock armour to the northeast of the marina entrance had numerous new and old spraints, together with feeding remains suggesting that it is often used by otters. The area provides good habitat for sheltering or feeding and is free from human disturbance.

The area to the south of the Gaeforce Marine compound had several fresh spraints and feeding remains. The rock armour in this area also provides suitable habitat for sheltering or feeding otters. There is more possibility of human disturbance in this area, due to ongoing activities within the Gaelforce compound, however, some protection is provided by the 1m flood wall which extents along the top of the riverbank.

Further old spraints were observed on the Longman and South Citadel Quays, suggesting that otters do frequent these area, but do not utilise them regularly. No evidence of otter presence was recorded on either bank of the River Ness in the immediate vicinity of Shore Street Quay.

No evidence of couches, layups or holts was found within the survey area, suggesting that while otters are certainly present thin the lower reaches of the River Ness, they do not use the area for breeding or long term resting or sheltering.

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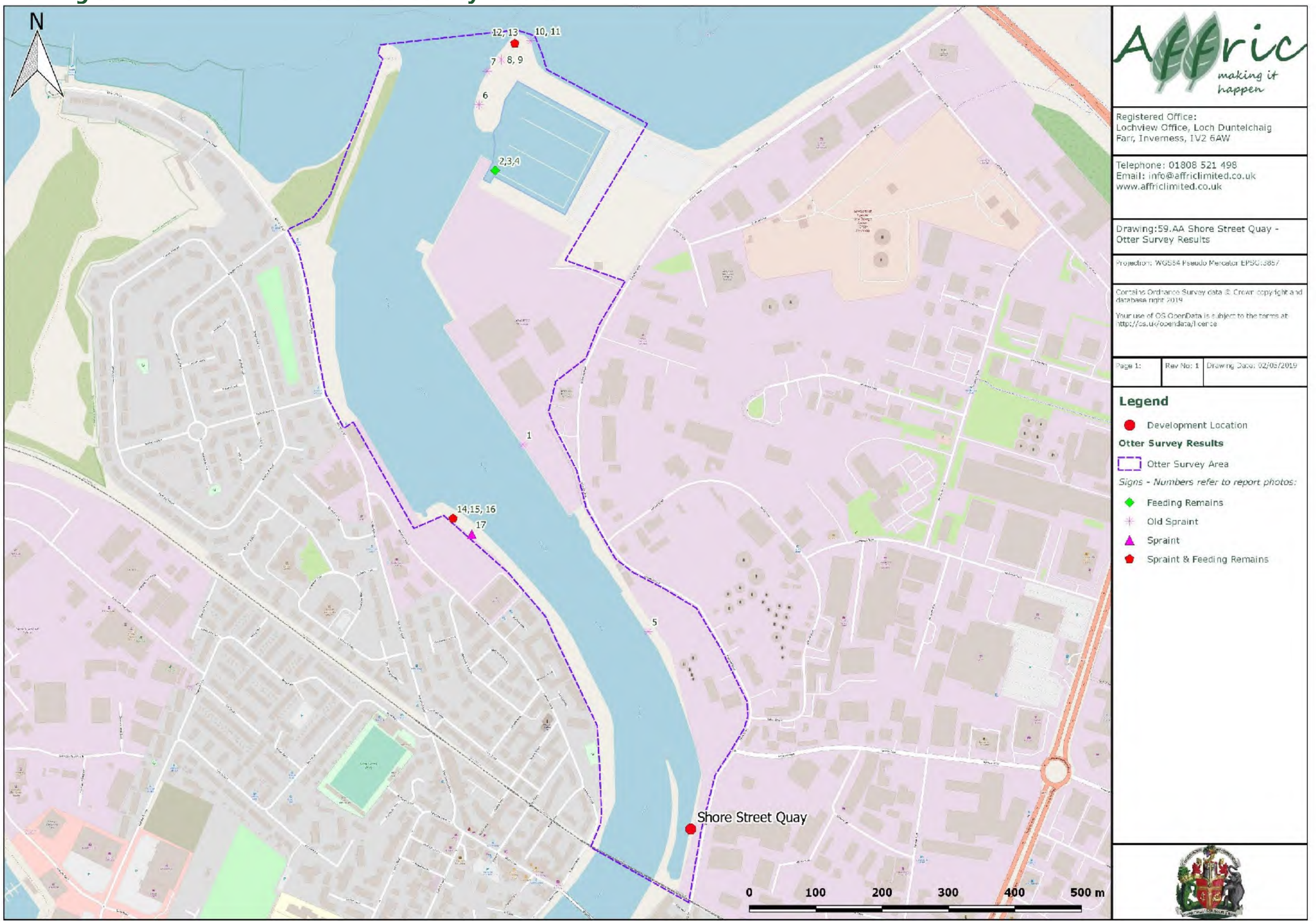
The 'UK Post-2010 Biodiversity Framework' (July 2012)

Drawing 59.AA: Port of Inverness Otter Survey Results



Appendix A: Survey Photos

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

Photo 15

Photo 16

Photo 17

Appendix 3: Benthic Survey Report

Port of Inverness – Maintenance Dredge Works

Benthic Video Survey Report

Date: 07/02/2022

Document Number: 80/REP/T06-02

Document Control

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Effective Date:	**07/02/2022**

Revision No:	Signature	Comments	Date
1A	J Clarkson	Submitted for client review	01/02/2022
1	J Clarkson	Submission to regulator	07/02/2022

Contents

1 Introduction

It is understood that parts of the operational areas within the Port of Inverness are subject to siltation. As such, these areas require periodic maintenance dredging, to ensure safe navigation of vessels in the harbour area.

Pre-disposal sampling activities to support the maintenance dredge marine licence application identified an environmental receptor; a blue mussel bed (*Mytilus edulis),* at a single sampling location within the navigational channel of the Port of Inverness. Blue mussel beds are defined as a Priority Marine Feature (PMF) under the Marine (Scotland) Act 2010 and are included on the OSPAR (Annex V) list of threatened and declining species and habitats.

A benthic survey was therefore conducted to understand the extent of this blue mussel bed and whether the national PMF status of blue mussel beds, or other benthic species that may be present within the harbour area, will be impacted upon by the proposed dredge works. Anderson Marine Surveys Ltd (AMSL) were appointed by the Port of Inverness to undertake the benthic video surveys.

This report provides information on the methodology used to retrieve information on benthic species within the Port of Inverness and details the results of the benthic video survey conducted. This information will be used to inform the Environmental Supporting Document submitted as part of the marine licencing application process for the proposed maintenance dredge works and to inform any future harbour developments.

2 Methodology

Benthic video sampling was conducted on the 6th and 7th January 2022, which provided a suitable weather window and favourable tide times for vessel operation.

2.1 Survey Vessel

Benthic video surveys were conducted from AMSL's vessel, Mollie B. Mollie B is designed and coded to meet Marine Safety Agency requirements for workboat operations in Category 3 waters (open waters, up to 20 miles offshore) and has conducted numerous benthic surveys across Scotland.

A primary vessel positioning system was used onboard Mollie B. The primary vessel positioning system was provided by a Simrad NSS7 evo-2. The systems receiver continuously tracks up to 12 satellites at one time and automatically utilises satellites with the most geometry to calculate position. Differential beacon corrections broadcast by the General Lighthouse Authority were available in this area.

2.2 Video Survey Methodology

2.2.1 Survey Equipment

To determine the extent of the blue mussel bed(s) and the presence of other PMFs within the Port of Inverness harbour authority area, a primary video system that consisted of a high-definition Bowtech DIVECAM-550C-AL-I4 camera, high-definition GoPro video camera and two high intensity LED lights were fitted to a camera frame. The camera frame was towed along the pre-defined transect lines (see Section 2.3.1) at approximately 0.5 knots, just above the seabed and was allowed to settle briefly on the seabed at frequent intervals without damaging

any seabed features. Lighting systems on the cameras were battery powered and the underwater Bowtech camera allowed for live viewing of the footage. The live footage of the benthic video transects were representative of that being recorded on the GoPro. A complete spare video system was supplied in case of loss or malfunction of the primary video system.

Computer and monitor systems in the boat cabin were powered from independent 12V supplies to allow for the footage to be viewed during the survey works and identify changes in habitat type. This helped the ecologists onboard understand the need for additional survey transects to be undertaken, where required (see Section 2.3.2).

2.2.2 Onboard Analysis of Footage

Initial interpretation of the footage was undertaken *in situ* to determine and record the extent of different habitats and identify whether there were sparsely or densely populated areas of particular species. Primarily, there was a focus on the presence of blue mussel bed habitats or other species of conservation importance (e.g. PMFs). Survey logs were completed for each transect, detailing each drop of the camera equipment, with the following information recorded per deployment:

- Transect number;
- Date;
- Start time (24-hour format);
- Water depth; and
- Any conspicuous fauna and presence/absence of PMFs.

2.3 Survey Locations

2.3.1 Pre-defined Transects

A total of 5 pre-defined video survey transects were surveyed on the 6th January 2022.

To understand the extent of the known blue mussel bed that has been identified during pre-disposal sampling activities, perpendicular video survey transects around the sampling point where blue mussels were first identified were required. These transects are shown by the red lines in Drawing 80_DRG_01_1 (Transects T1 to T2 and T4 to T3).

As areas within the River Ness channel also require maintenance dredge works, two parallel video survey transect lines were proposed in Drawing 80_DRG_03_1 (Transects T8 to T9 and T10 to T11). However, only one video survey transect was undertaken in this area, as the ecologists viewing the live footage during the first video survey transect in this area (T8 to T9) did not identify any receptors of concern (see Section 3: Results). The second transect (T10 to T11) was unlikely to identify anything of interest in the river, it was decided that survey time would be better utilised elsewhere within the harbour.

In addition, two video survey transects (as shown by the purple lines in Drawing 80_DRG_02_1 (Transects T6 to T5 and T6 to T7) were proposed to identify whether blue mussels or other PMFs persist within the wider harbour area.

The start and end coordinates of each pre-defined video survey transect are indicated in Table 2.1.

Table 2.1: Start and end coordinates for each of the pre-defined Port of Inverness Transects

Transect Point	GIS Grid Ref	Lat / Long	Survey Area
T1	266095 847312	57’ 29.769266 N 4’ 14.154962 W	Known Blue Mussel Location
T2	266138 847495	57’ 29.868582 N 4’ 14.117978 W	Known Blue Mussel Location
T3	266158 847415	57’ 29.825853 N 4’ 14.095338 W	Known Blue Mussel Location
T4	266097 847429	57’ 29.832311 N 4’ 14.156816 W	Known Blue Mussel Location
T5	265527 847281	57’ 29.748339 N 4’ 13.723115 W	Wider Harbour Area
T6	266606 847518	57’ 29.889254 N 4’ 13.650596 W	Wider Harbour Area
T7	266313 847202	57’ 29.713891 N 4’ 13.933290 W	Wider Harbour Area
T8	266137 847290	57’ 29.758163 N 4’ 14.112227 W	River Ness
T9	266365 846316	57’ 29.237662 N 4’ 13.852161 W	River Ness
T10	266324 846259	57’ 29.206239 N 4’ 13.891287 W	River Ness
T11	266091 847294	57’ 29.759501 N 4’ 14.158370 W	River Ness

2.3.2 Additional Transects

Whilst onboard the Mollie B, the ecologist identified four additional transects for completion to help gather as much information as possible on the benthic features within the Port of Inverness harbour area. One of the additional video survey transects undertaken was a repeat of a pre-defined transect that had already been surveyed (T2 – T1). This transect was required to be repeated as there was GPS ‘drop-out’ during the original transect, and the coordinates could not be recovered from the boats computer system for the entire length of the transect.

Additional video survey transects were also carried out in parallel to transect line T2 – T1 and across the mouth of the River Ness channel, from the Port of Inverness Marine to Carnac Point.

The start and end coordinates of each additional video survey transect are indicated in Table 2.2 and shown on Drawing 80_DRG_04_1.

Table 2.2: Start and end coordinates for each of the additional Port of Inverness Transects

Transect Point	GIS Grid Ref	Lat / Long	Survey Area
T12	266065.7 847394.92	57’29.813402 N 4’ 14.187002 W	Known Blue Mussel Location
T13	266221.2 847364.17	57’ 29.799600 N 4’ 14.030398 W	Known Blue Mussel Location
T14	266188.8 847564.66	57’29.906997 N 4’ 14.069457 W	Wider Harbour Area
T15	266078.3 847286.43	57’ 29.755200 N 4’ 14.170804 W	Known Blue Mussel Location
T16	266299.2 847637.91	57’29.948402 N 4’ 14.961433 W	Wider Harbour Area
T17	266087.5 847257.16	57’ 29.948403 N 4’ 13.961403 W	River Ness
T18	266239.5 847318.41	57’29.775280 N 4’ 14.010637 W	Wider Harbour Area
T19	266221.7 847629.26	57’ 29.942370 N 4’ 14.038673 W	Wider Harbour Area

2.4 Post-Survey Analysis of Footage

The GPS track data for the transects were overlayed onto the video for ease of interpretation and the coordinates of the paused frames, including the coordinates of any significant changes in species or substrate, were recorded from the video overlay to allow accurate spatial mapping of any habitats. Where transects experienced GPS ‘drop-out’ for small proportions

of the transect time, habitat and/or species type were noted for each coordinate change or when there was a significant change in species or substrate to increase the accuracy of spatial mapping of any habitats. This was also performed to ensure that any loss of data did not affect the overall results of the habitat mapping.

Once the species composition and habitat types had been noted for each video transect, these data were then imported into QGIS to delimit the habitats present along the GPS track. Once the transects had been mapped, areas of similar or the same habitat type within the dredge boundary, were linked manually to form larger polygons.

It should be noted that the habitat illustrated within the Port of Inverness proposed dredge boundary is an estimate based on the benthic video transects undertaken, and is purely illustrative.

Transect T2 to T1 was not included in the post-survey analysis as the additional transect, T14 toT15, provided more valuable information as little GPS 'drop-out' occurred during this video survey. In addition, transect T10 toT11 was not surveyed as it ran in parallel to transect T8 to T9. It was predicted that the outcome of these two transects would highlight the same habitat type for the River Ness.

3 Results

Within the Port of Inverness harbour area, the following EUNIS habitats (MarLIN, 2016) were recorded:

- 'Sublittoral coarse sediment' (EUNIS Code A5.1);
- 'Sublittoral mud' (EUNIS Code A5.3);
- 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS Code A2.721); and,
- 'Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata' (EUNIS Code A3.213).

Other habitats identified, which do not have an assigned EUNIS code, but denoted the Joint Nature Conservation Committee (JNCC) 2015 adopted codes (Connor *et al.,* 2004), were a mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata' (JNCC Code LS.LBR.LMus.Myt / IR.MIR.KR.LhypTX).

The PMFs recorded within the Port of Inverness harbour area were 'Blue mussel, *Mytilus edulis* beds on mixed infralittoral sediments' and 'Kelp, *Laminaria hyperborea* on tide-swept infralittoral mixed substrata'.

The predicted extent of each habitat or substrate-type within the Port of Ivnverness harbour area and each transect point is illustrated in Drawing 80_DRG_04_1.

Table 3.1 outlines the list of habitats and PMF's identified within the Port of Inverness harbour area. PMF codes were included for features identified as PMF.

Table 3.1: List of PMFs and habitats identified within the Port of Inverness harbour area

Habitat Feature	PMF Code	EUNIS Code	JNCC Code
Sublittoral coarse sediment	N/A	A5.1	SS.SCS.ICS.SSh

Sublittoral mud	N/A	A5.3	SS.SMu.SMuLS
Blue mussel *Mytilus edulis* beds on littoral sediments	ME	A2.721	LS.LBR.LMus.Myt
Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata	KS	A3.213	IR.MIR.KR.LhypTX
Mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata	ME / KS	A2.721 / A3.213	LS.LBR.LMus.Myt / IR.MIR.KR.LhypTX

3.1 Transect T12 to T13

Transect T12 to T13 was approximately 201.5m long and ran from north west to south east in its initial stages, before moving moving from a south westerly direction to north-east. Table 3.2 provides information on the transect length of each habitat surveyed as encountered in moving easterly along the survey. Figure 3.1 provides representative images of the habitats surveyed, where: a) is 'Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata' (EUNIS 3.213) & b) is Mixed habitat consisting of sparese 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata (EUNIS A2.721 & EUNIS A3.213).

Table 3.2: Length of each habitat surveyed during Transect T13 to T12

Transect Length	Habitat Type
16.5m	Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata (EUNIS 3.213) (Figure 3.1a)
33.5m	Sparse 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata (Figure 3.1b)
5.9m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
28.2m	Sublittoral coarse sediment' (EUNIS A5.1)
18.6m	Sublittoral mud' (EUNIS A5.3) which appeared to lack the presence of epifauna

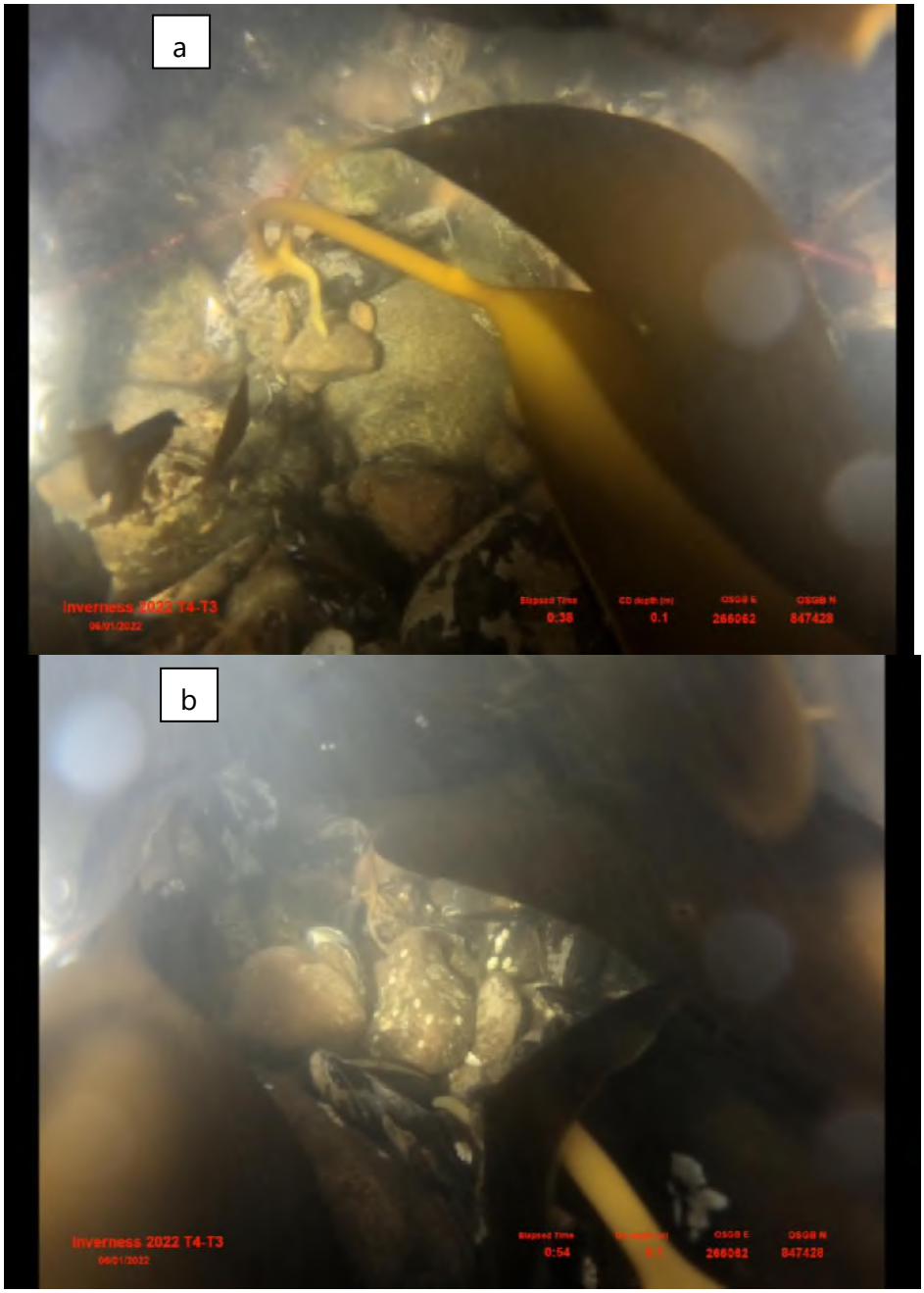


Figure 3.1: Representative seabed images for Transect T13 to T12.

3.2 Transect T14 to T15

Transect T14 to T15 was an extension of Transect T2 to T1 and was approximately 362.2m long. The transect ran in a north-north east to south-south westerly direction. Table 3.3 provides information on the transect length of each habitat surveyed as encountered in the survey direction.

Table 3.3: Length of each habitat surveyed during Transect T14 to T15

Transect Length	Habitat Type
132.6m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
51.2m	Dense 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata
54.3m	Sublittoral coarse sediment' (EUNIS A5.1)
125.1m	Sublittoral mud' (EUNIS A5.3) which appeared to lack the presence of epifauna

3.3 Transect T16 to T17

Transect T16 to T17 ran in parallel to Transect T2 to T1 and Transect T14 to T15, to the east of the deposits above -3m CD which require dredging. Table 3.4 provides information on the transect length of each habitat surveyed as encountered in the survey direction.

Table 3.4: Length of each habitat surveyed during Transect T16 to T17

Transect Length	Habitat Type
258.3m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
114.1m	Sublittoral coarse sediment' (EUNIS A5.1)
44.6m	Sublittoral mud' (EUNIS A5.3) which appeared to lack the presence of epifauna

Areas where *Mytilus edulis* were identified were a mixture of sparsely and densely populated blue mussel beds. Figure 3.2 provides representative images of the habitats surveyed, where: A) is Dense 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS A2.721) representative of the PMF and b) is Sparse 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS A2.721) within sublittoral coarse sediments (EUNIS A5.1).

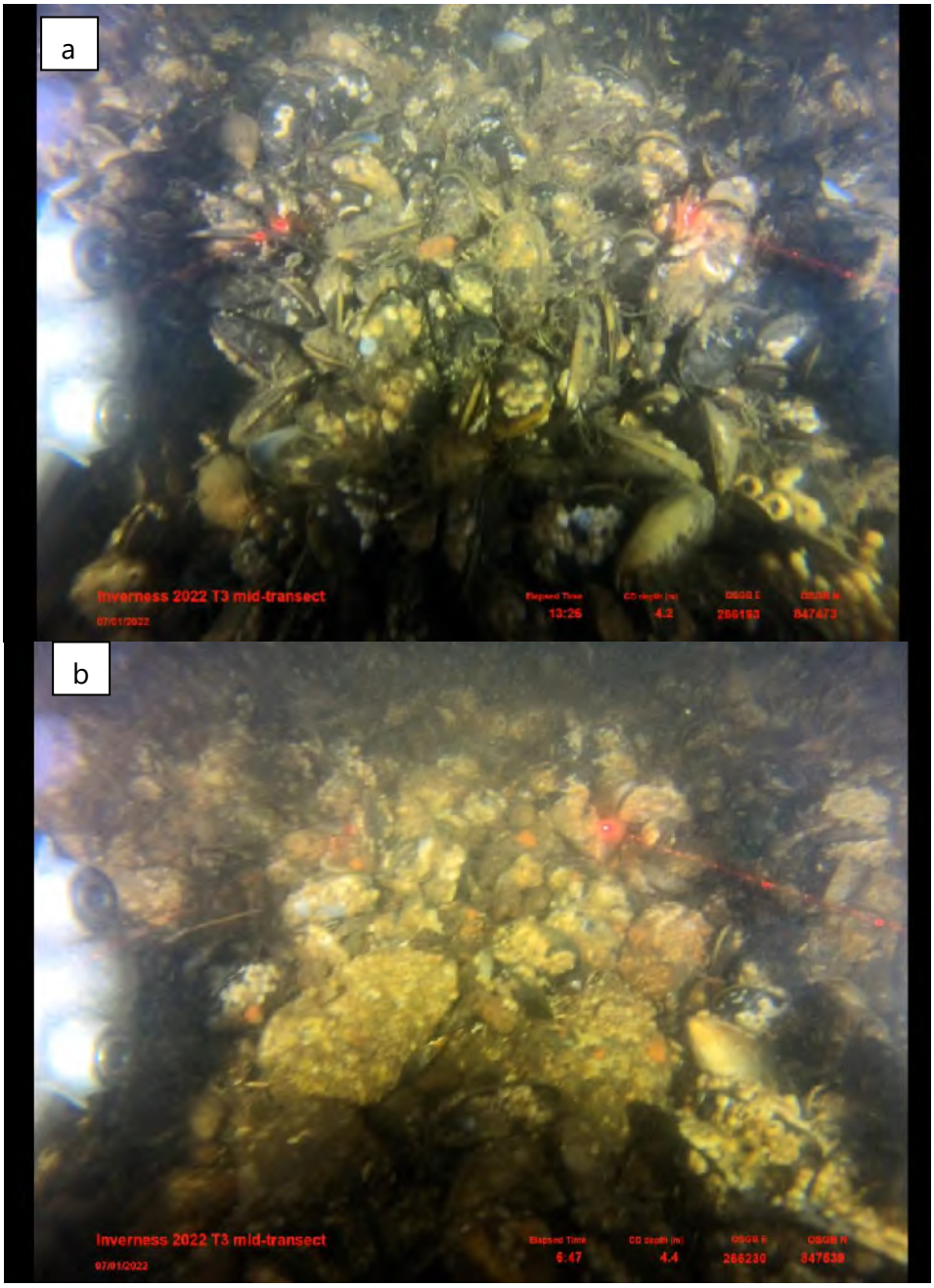


Figure 3.2: Selection of representative seabed images for Transect T16 to T17.

3.4 Transect T4 to T3

Transect T4 to T3 was 169.4m long and ran from east to west across then dredge channel. The transect ran through one of the three deposits above -3m CD which require dredging. Table 3.5 provides information on the transect length of each habitat surveyed as encountered in the survey direction.

Table 3.5: Length of each habitat surveyed during Transect T4 to T3.

Transect Length	Habitat Type
135.9m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
26.4m	Mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata

7.0m	Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata (EUNIS 3.213).

Mytilus edulis beds further to the east of the dredge channel were sparse and fractured in nature within sublittoral coarse sediments (EUNIS A5.1). Consequently, this is not considered a good quality example of the PMF. *Mytilus edulis* found over the deposit above -3m CD and within *Laminaria hyperborea* habitat were dense in nature, and were much more representative of the PMF. Figure 3.3 provides representative images of the habitats surveyed, where: a) is Sparse 'Blue mussel Mytilus edulis beds on littoral sediments' (EUNIS A2.721) within sublittoral coarse sediments (EUNIS A5.1). b) dense 'Blue mussel Mytilus edulis beds on littoral sediments' (EUNIS A2.721) representative of the PMF.

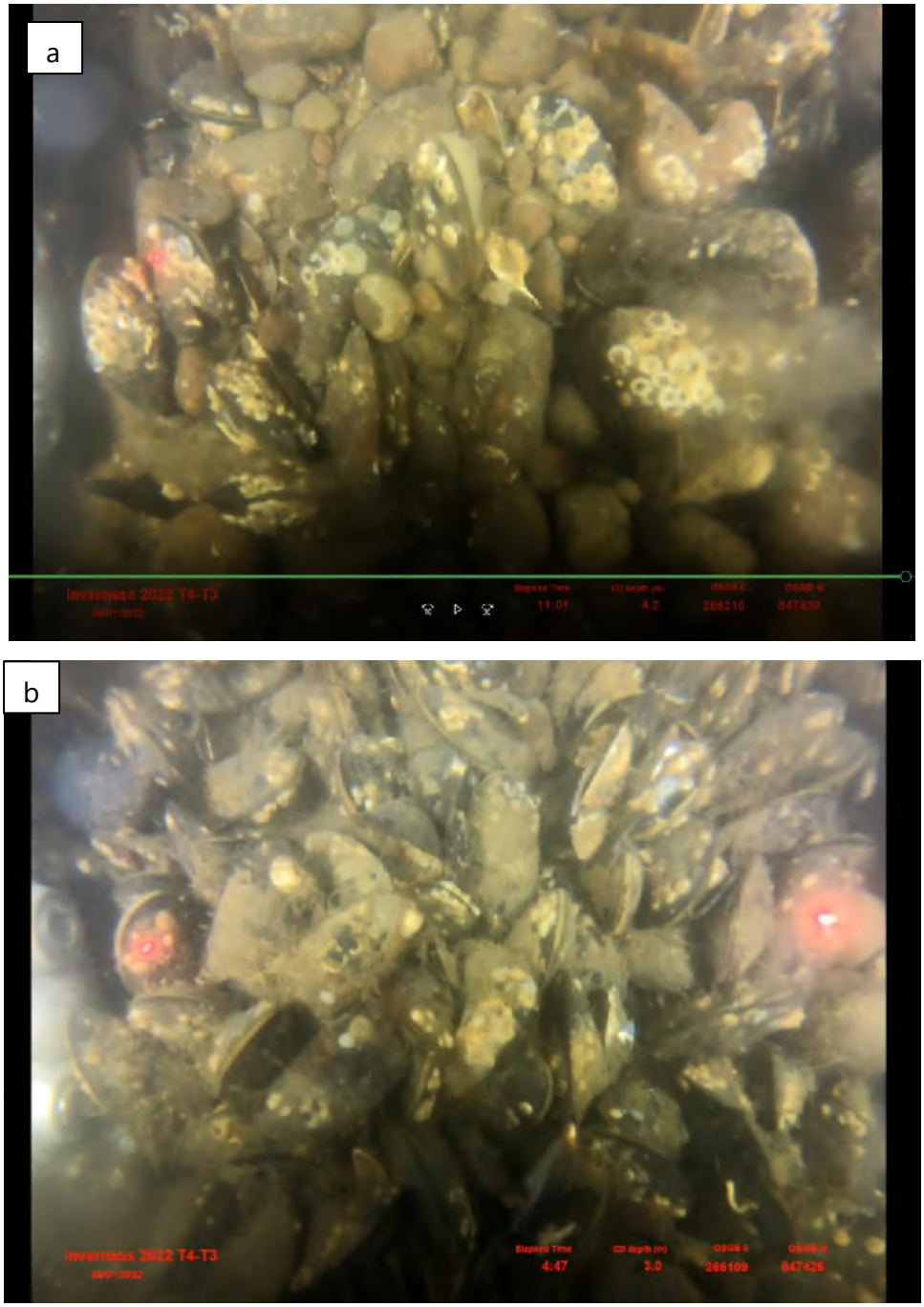


Figure 3.3: Transect T4 to T3; Selection of representative seabed images.

3.5 Transect T6 to T5

Transect T6 to T5 was 805.3m long and ran roughly from east to west across the dredge channel towards Merkinch Pier. The transect ran through the same deposit above - 3m CD as transect T4 to T3. Table 3.6 provides information on the transect length of each habitat surveyed as encountered in the survey direction.

Table 3.6: Length of each habitat surveyed during Transect T6 to T5.

Transect Length	Habitat Type
473.6m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)

26.4m	Mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata
128.6m	Sublittoral coarse sediments (EUNIS A5.1)
80.3m	Sublittoral mud (A5.3) which appeared to lack the presence of epifauna

Mytilus edulis beds further to the east of the dredge channel were sparse and fractured in nature within sublittoral coarse sediments (EUNIS A5.1). Consequently, this is not considered a good quality example of the PMF. *Mytilus edulis* found over the deposit above- 3m CD within the dredge channel, further west outwith the dredge channel and within kelp habitats were dense in nature, and were much more representative of the PMF. Figure 3.4 provides representative images of the habitats surveyed, where: a) 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS A2.721) and b) Mixed habitat consisting of dense 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata (EUNIS A2.721 & EUNIS A3.213) outwith the dredge boundary.

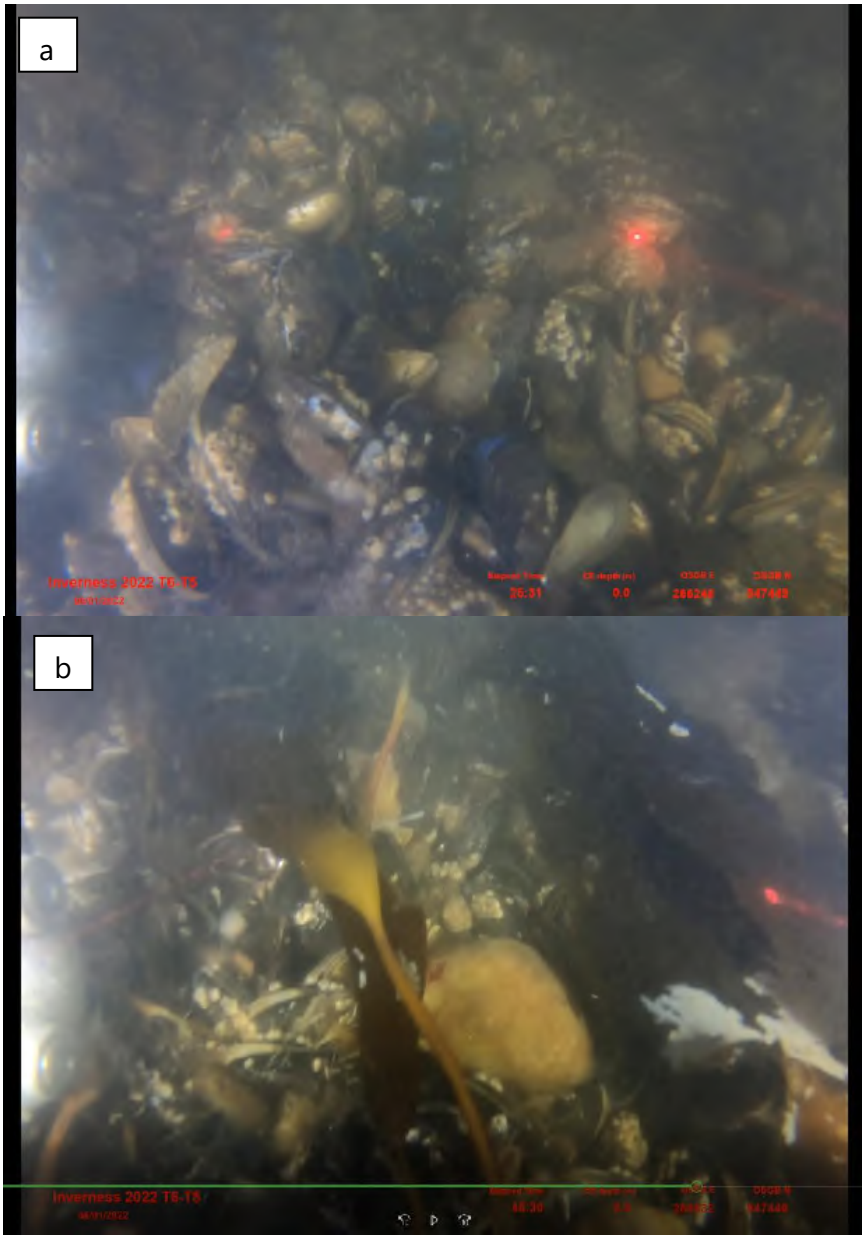


Figure 3.4: Transect T6-T5; Selection of representative seabed images.

3.6 Transect T6 to T7

Transect T6 to T7 was approximate 439.3m long and ran from north east to south west. The transect was conducted completely outwith any of the dredge areas and was solely comprised of 'Sublittoral mud' (EUNIS A5.3) where remains of bivalves and blue mussels could be seen. Figure 3.5 provides a representative still image of the habitat surveyed.

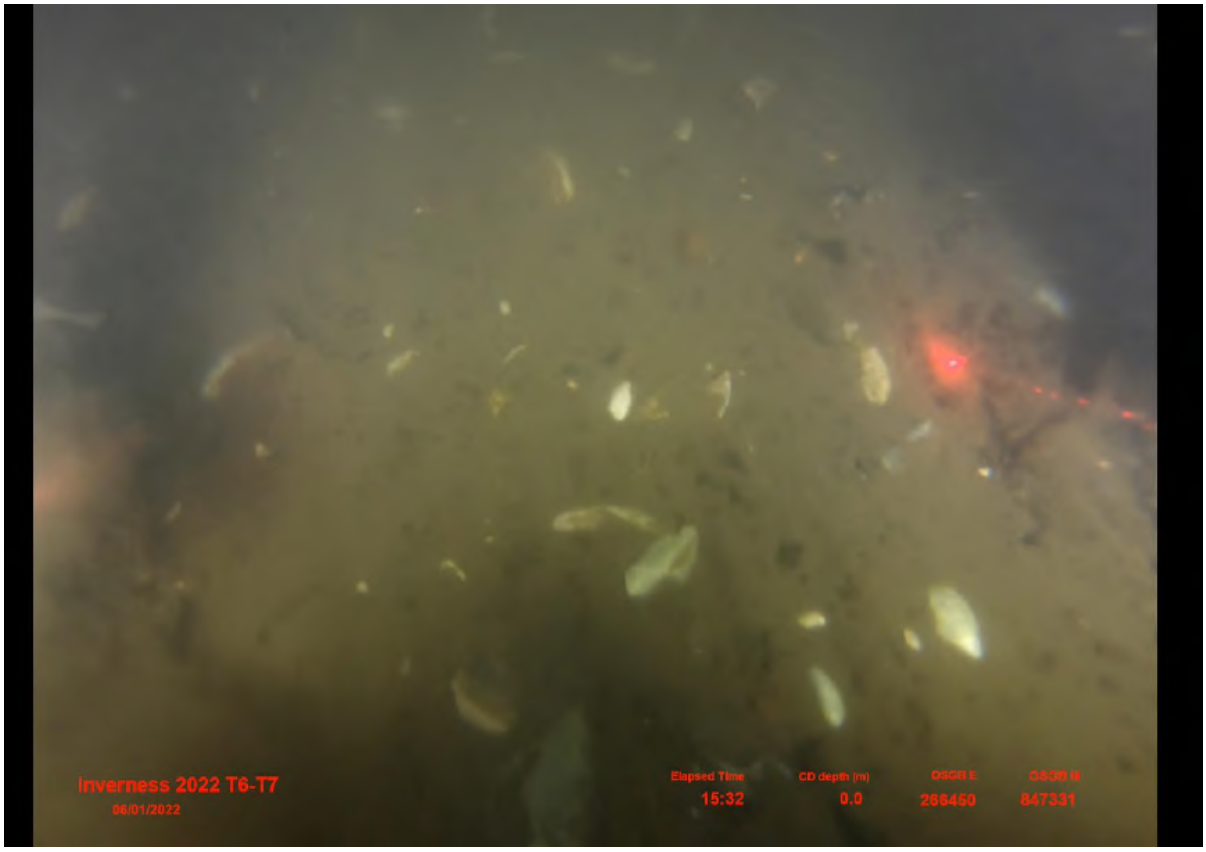


Figure 3.5: Transect T6 to T7; representative seabed habitat image.

3.7 Transect T18 to T19

Transect T18 to T19 was approximately 321.1m long and ran approximately from a north-north westerly direction to the south-south east. Table 3.7 provides information on the transect length of each habitat surveyed as encountered in the survey direction.

Table 3.7: Length of each habitat surveyed during Transect T18 to T19.

Transect Length	Habitat Type
89.9m	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
151.8m	Sublittoral coarse sediments (EUNIS A5.1)
79.3m	Sublittoral mud (A5.3) which appeared to lack the presence of epifauna

Mytilus edulis beds found outwith the dredge channel were dense in nature and were representative of the PMF. Figure 3.6 representative images of the habitats surveyed, where: a) is sublittoral coarse sediments (EUNIS A5.1); b) is 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS A2.721) found outwith the dredge boundary; and c) is 'Sublittoral mud' (EUNIS A5.3) which appeared to lack the presence of epifauna.

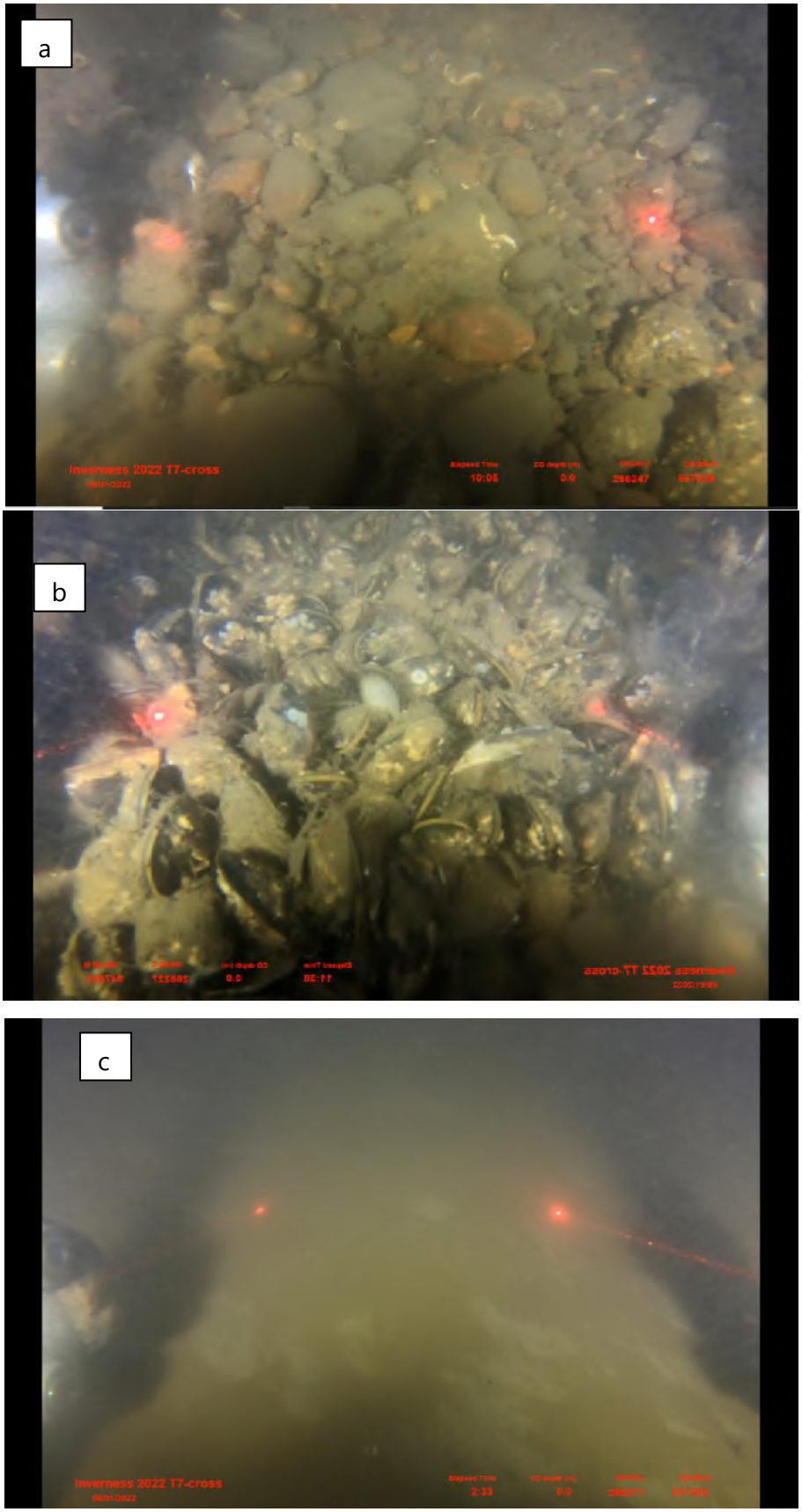


Figure 3.6: Transect T18 to T19; Selection of representative seabed images.

3.8 Transect T8 to T9

Transect T8 to T9 was undertaken to identify the representative habitats within the River Ness Channel dredge areas. The transect headed in approximately a southernly direction from just outside the River Ness Channel towards Shore Street Quay. The transect was approximately 1.1km long. The transect began with 20.9m of sublittoral coarse sediments (EUNIS A5.1) which transitioned into 'Sublittoral mud' (EUNIS A5.3), which appeared to lack the presence of epifauna.

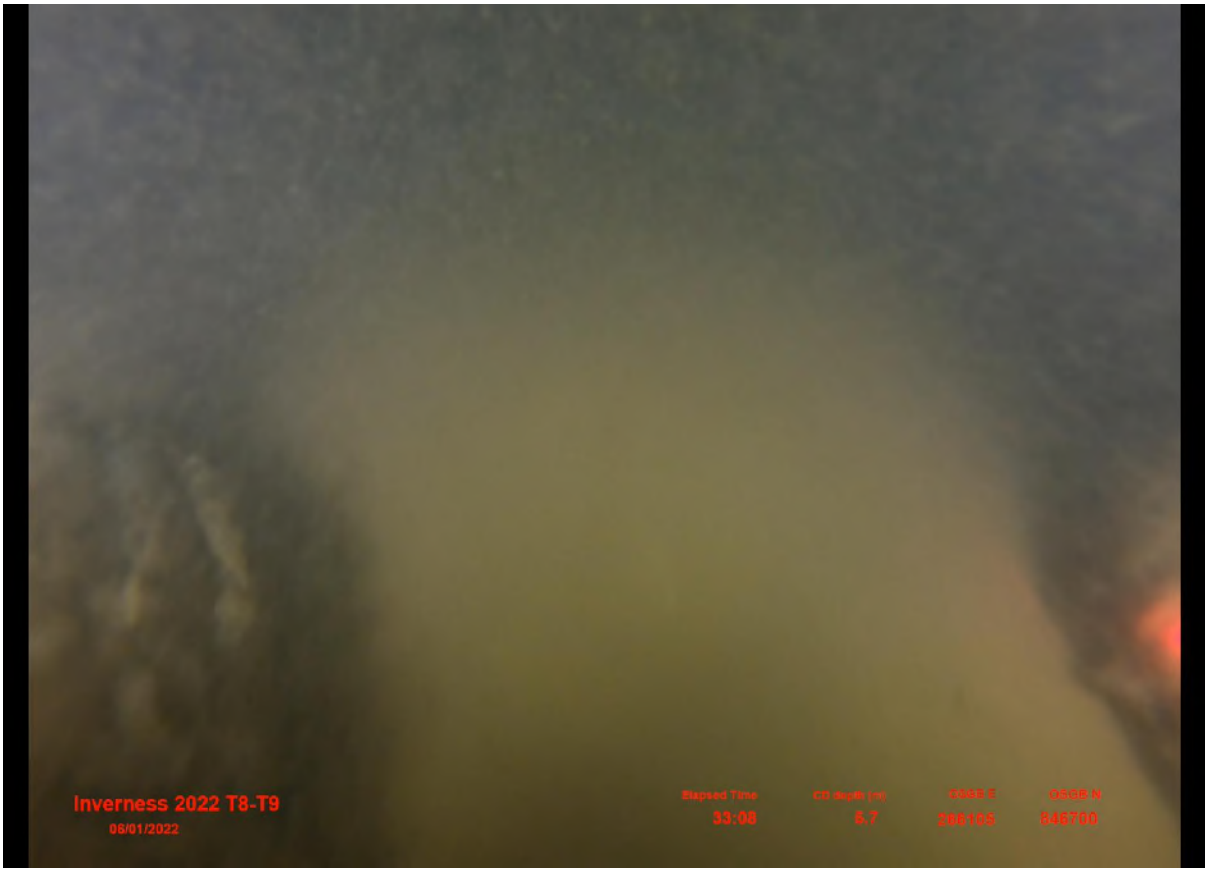


Figure 3.7: Transect T8 to T9; representative seabed image.

3.9 Broad Scale Habitat Map

Based on the extent of habitat types along transects the estimated geographic distribution of the habitats are provided in Figure 3.8. The estimated area of each habitat type is provided in Table 3.8. It should be noted that these ares are based on estimates, and are only indicative of where each habitat may be present.

Table 3.8: Estimated Area of Each Habitat

Estimated Area (m^2)	Habitat Type
43,000	Blue mussel *Mytilus edulis* beds on littoral sediments (EUNIS A2.721)
15,000	Mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments and Kelp *Laminaria hyperborea* on tide-swept infralittoral mixed substrata
37,000	Sublittoral coarse sediments (EUNIS A5.1)
436,000	Sublittoral mud (A5.3)

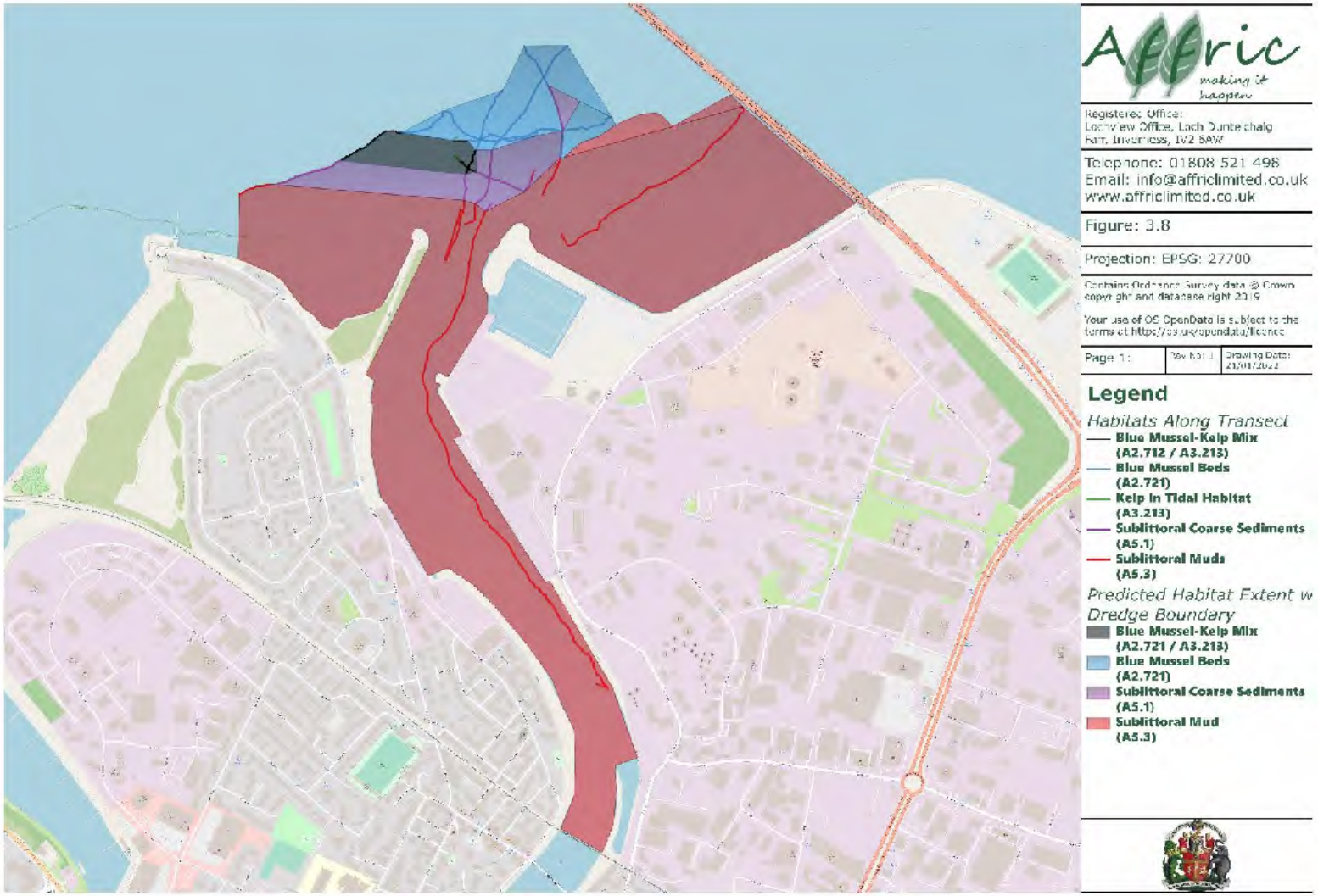


Figure 3.8: Estimated habitat extent within the Port of Inverness harbour area.

4 Summary

Benthic video surveys in the Port of Inverness harbour area were undertaken to identify the extent of the blue mussel bed habitat, and to identify whether other PMFs were present in the harbour area. A total of 9 transects were surveyed, with 8 transects subject to post-survey analysis.

Within the assessment area, an estimated area of:

- 37,000m^2 of 'Sublittoral coarse sediment' (EUNIS Code A5.1);
- 436,000m^2 of 'Sublittoral mud' (EUNIS Code A5.3);
- 43,000m^2 of 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS Code A2.721); and,
- 15,000m^2 of mixed habitat consisting of 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS Code A2.721) and 'Kelp *Laminaria hyperborea on tide-swept infralittoral mixed substrata'* (EUNIS Code A3.213) were identified.

The PMF feature 'Kelp, *Laminaria hyperborea,* on tide-swept infralittoral mixed substrata' (EUNIS A3.213) was limited to the north of Carnac Point, outwith the dredge boundary and along the outer, western edge of the dredge boundary. This habitat was found along Transect T12 to T13, T14 to T15, T4 to T3 and T6 to T5. Video transects were unable to determine whether areas of kelp in this instance were representative of a PMF habiat, or whether they were fractured in nature.

The other PMF feature, 'Blue mussel *Mytilus edulis* beds on littoral sediments' (EUNIS A2.721), was found throughout the far north of the dredge boundary and in areas west of the dredge channel, north of Carnac Point. This habitat was found along Transect T12 to T13, T14 to T15, T16 to T17, T4 to T3, T6 to T5 and T18 to T19. It should be noted, that *Mytilus edulis* beds found along the most north-easterly parts of the dredge boundary were sparse and fractured in nature within sublittoral coarse sediments (EUNIS A5.1), which are not considered a good quality example of the PMF. Blue mussel beds found north and north-west of Carnac Point, and along the western shoulder of the dredge boundary were densely populated and much more representative of the PMF.

No other PMFs were identified during the surveys.

5 References

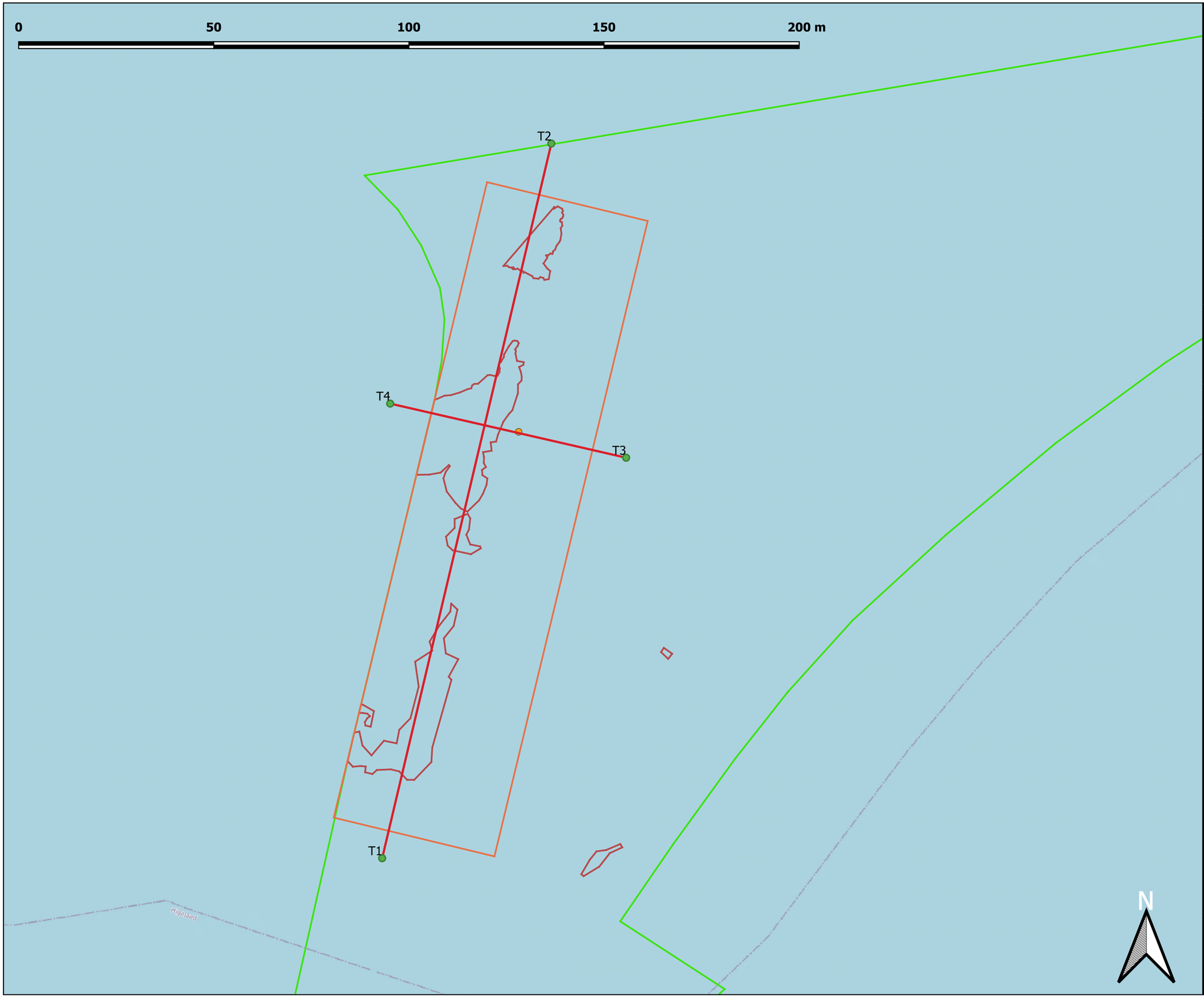
Connor, D.W., Allen, J.H., Golding, N., Howell, K.L., Lieberknecht, L.M., Northern, K.O., Reker, J.B. (2004). The Marine Habitat Classification for Britain and Ireland. *Joint Nature Conservation Committee*. Available from: https://mhc.jncc.gov.uk/media/1027/04_05_introduction.pdf

MarLIN (Marine Life Information Network). (2016). Marine Life Information Network. *Plymouth: Marine Biological Association of the United Kingdom*. [On-line]. Accessed on 21/10/20. Available from: www.marlin.ac.uk

6 Glossary

Acronym	Definition
AMSL	Anderson Marine Surveys Limited
CD	Chart Datum
JNCC	Joint Nature Conservation Committee
km	kilometres
m	metres
MarLIN	Marine Life Information Network
PMF	Priority Marine Feature

Drawings



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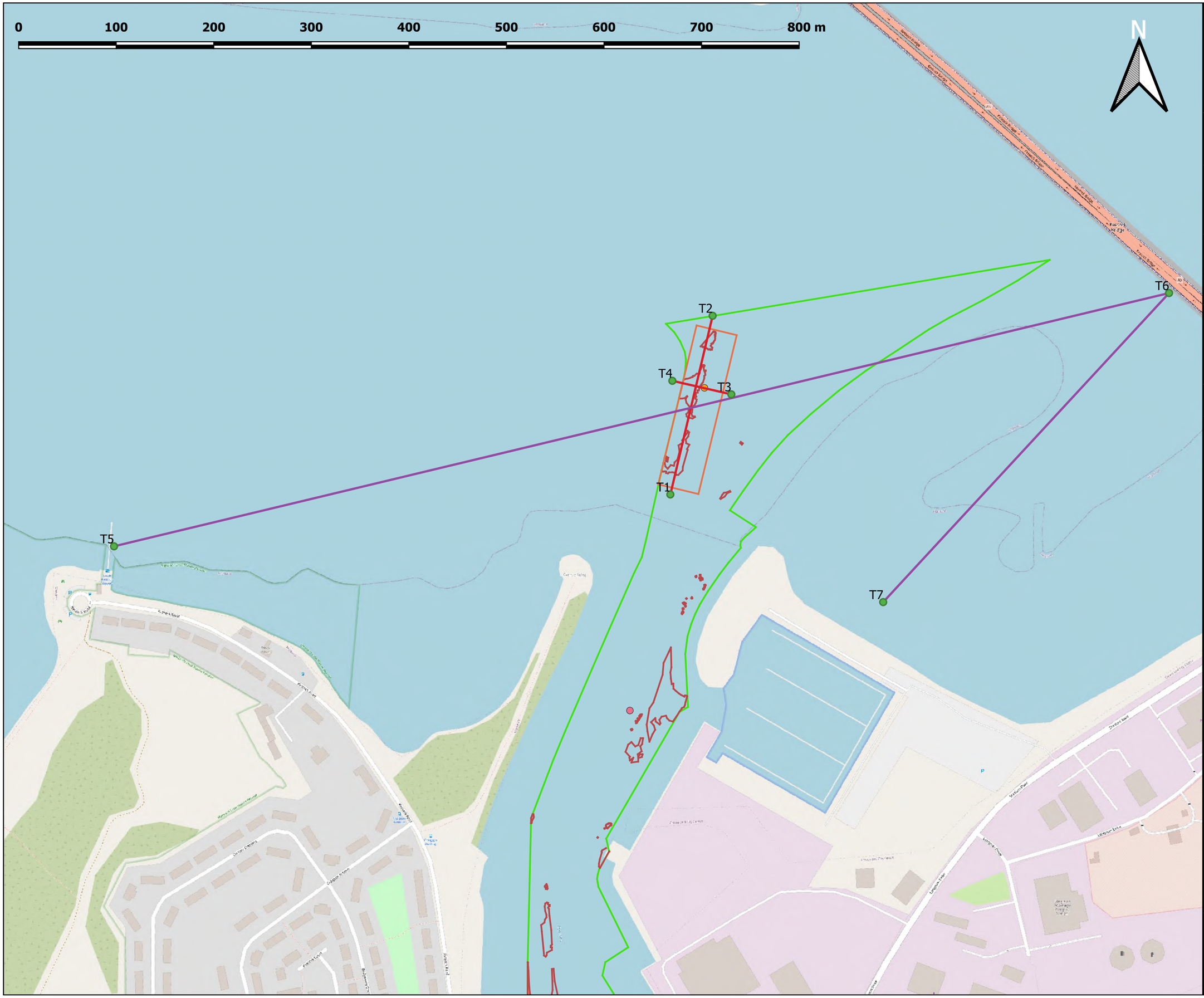
Drawing: 80_DRG_01_1

Projection: British National Grid EPSG:27700

Page 1:	Rev No: 1	Drawing Date: 23/11/2021

Legend

- Area Around Grab Sample 3
- Grab Sample 3
- Deposits Above 3m CD
- River Dredge Channel
- Transect Lines
- Transect Points



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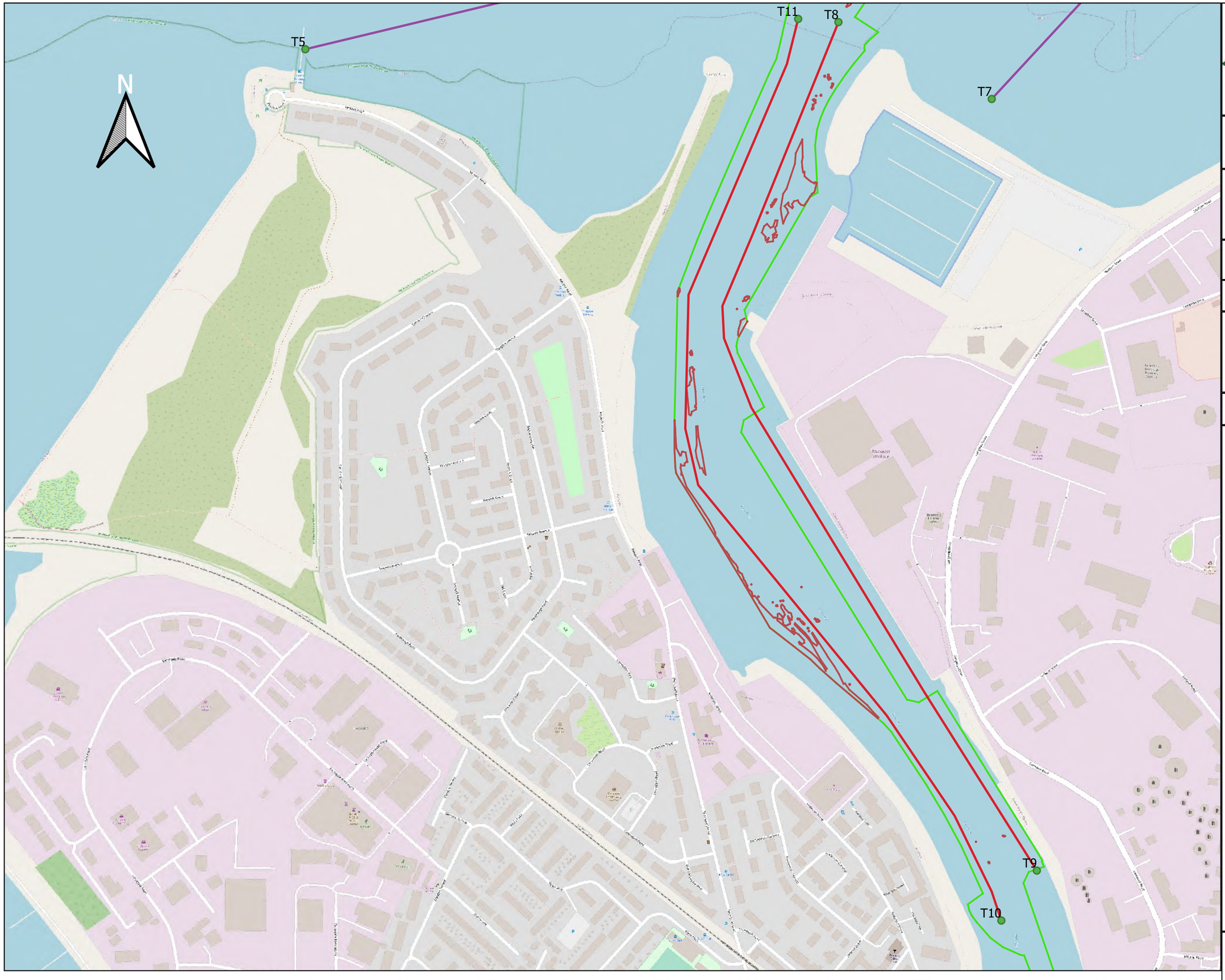
Drawing: 80_DRG_02_1

Projection: British National Grid EPSG:27700

Page 1:	Rev No: 1	Drawing Date: 23/11/2021

Legend

- Area Around Grab Sample 3
- Grab Sample 3
- Deposits Above 3m CD
- River Dredge Channel
- Transect Lines
- Additional Transects
- Transect Points



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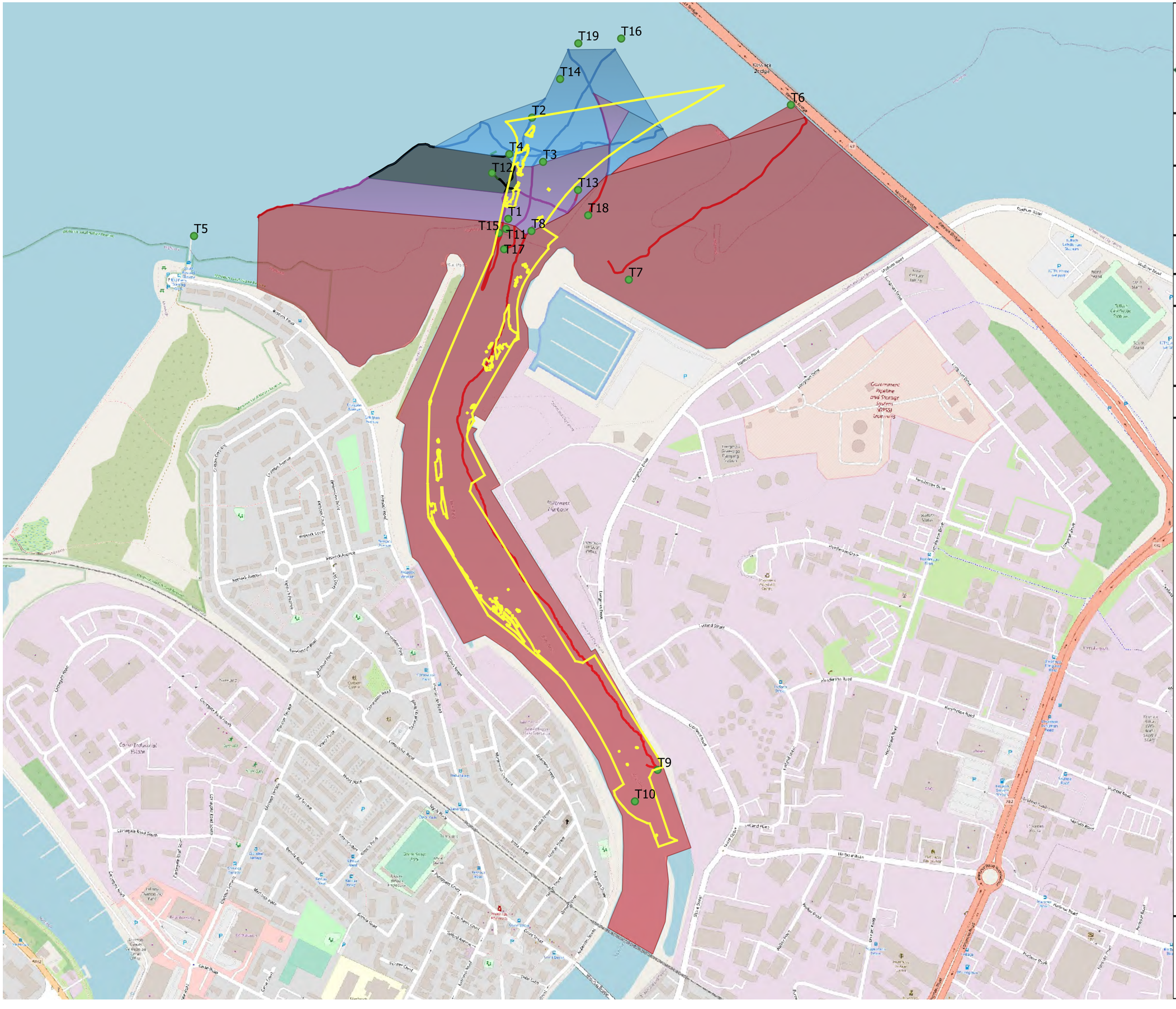
Page 1:	Rev No: 1	Drawing Date: 23/11/2021

Legend

- Deposits Above 3m CD
- River Dredge Channel
- Transect Lines
- Transect Points



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Drawing: 80_DRG_04_1

Projection: EPSG: 27700

Page 1:	Rev No: 1	Drawing Date: 21/01/2022

Legend

- Deposits Above 3m CD
- River Dredge Channel
- Transect Points

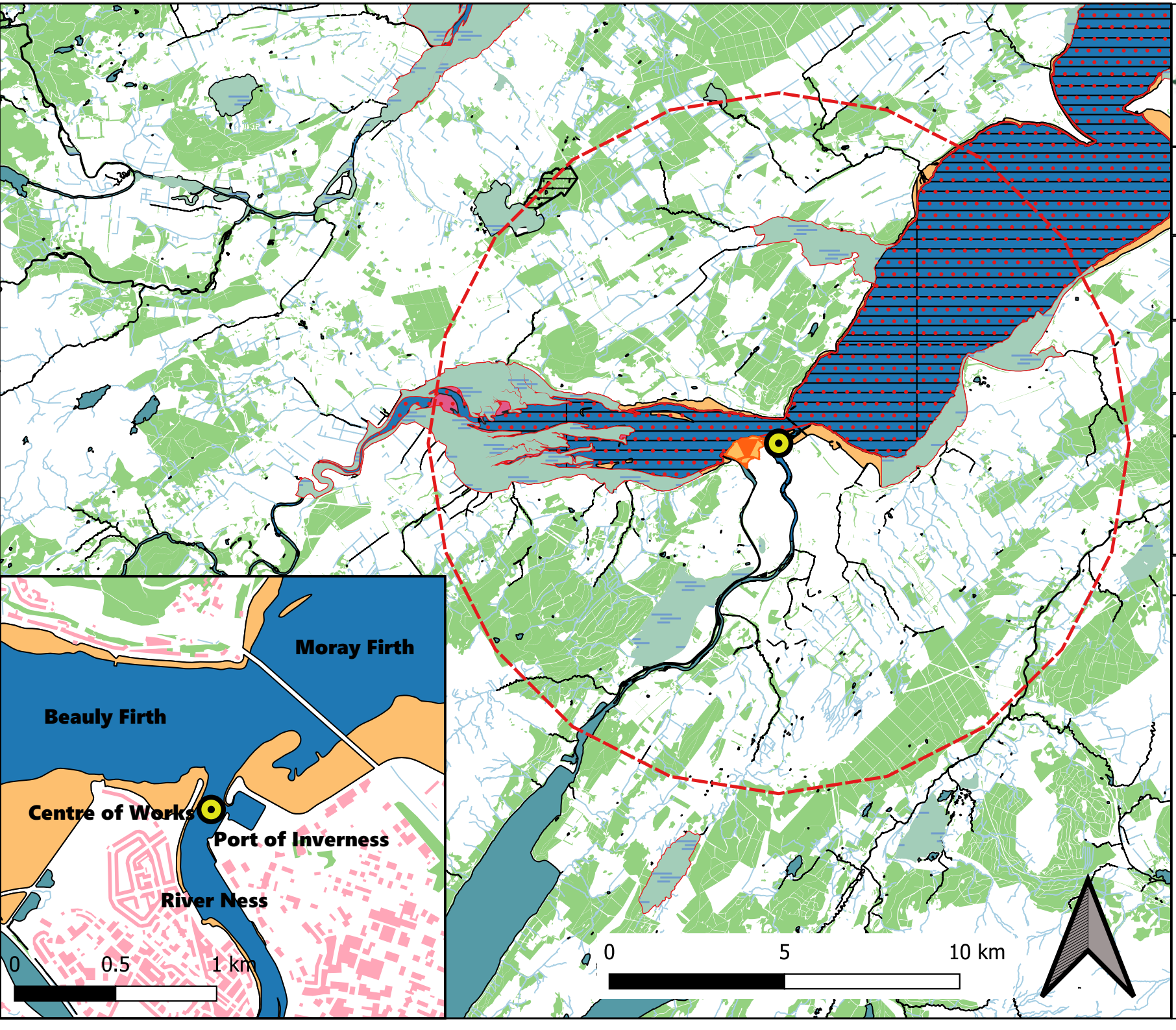
Habitats Along Transect

- Blue Mussel-Kelp Mix (A2.712 / A3.213)
- Blue Mussel Beds (A2.721)
- Kelp in Tidal Habitat (A3.213)
- Sublittoral Coarse Sediments (A5.1)
- Sublittoral Muds (A5.3)

Predicted Habitat Extent within Dredge Boundary

- Blue Mussel-Kelp Mix (A2.721 / A3.213)
- Blue Mussel Beds (A2.721)
- Sublittoral Coarse Sediments (A5.1)
- Sublittoral Mud (A5.3)

Drawings



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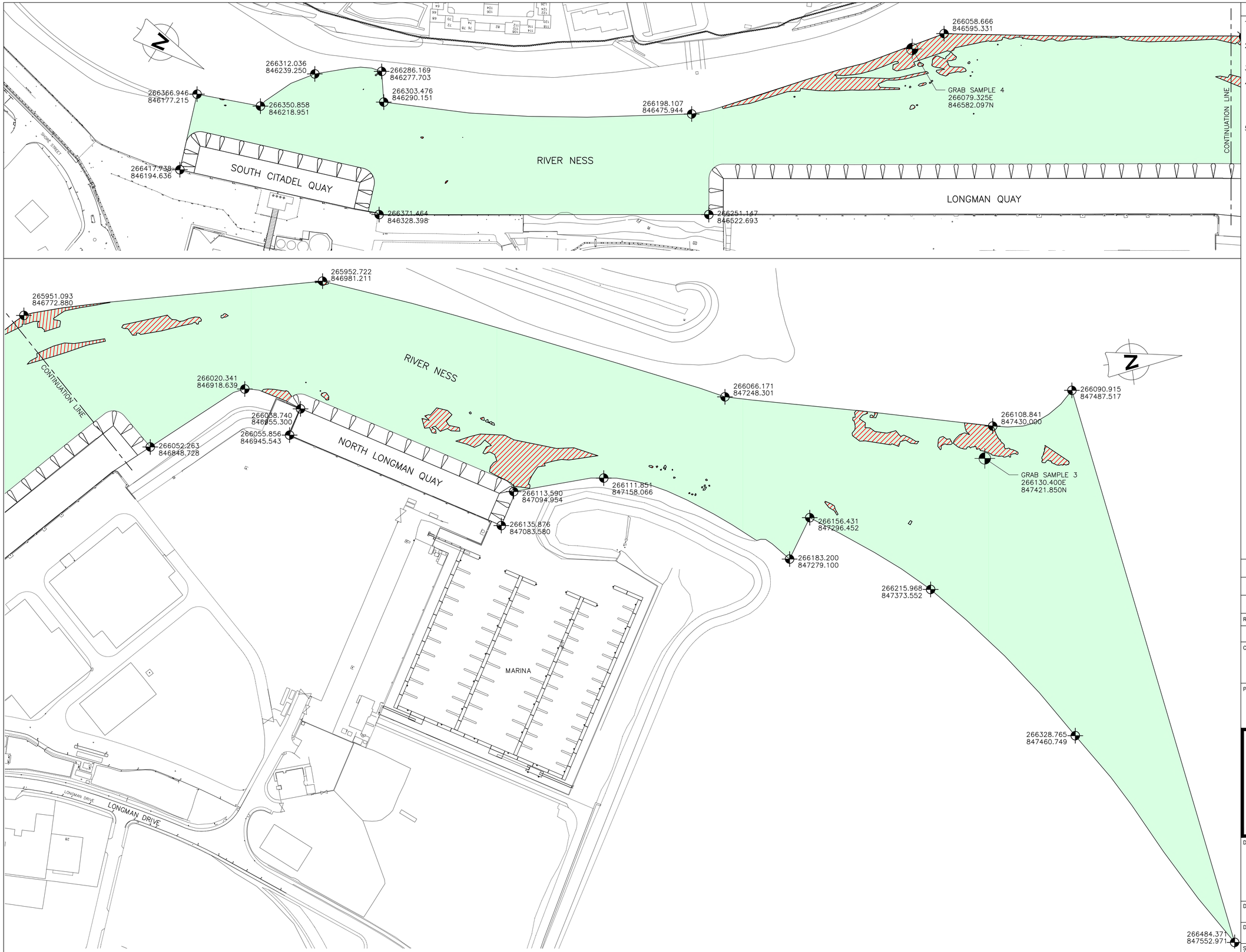
Title: 80/01 Designated Sites relevant to the proposed maintenance dredge works

Projection: OSGB 1936/British National Grid EPSG: 27700

Page 1	Rev No: 1	Drawing Date: 13/10/2021

Legend

- 10km Buffer
- Centre Point of Works
- Local Nature Reserve
- Specific Site of Scientific Interest (SSSI)
- Special Protected Area (SPA)
- RAMSAR Site
- Special Area of Conservation (SAC)
- Buildings



RIVER NESS CHANNEL DREDGE

SCALE 1:1250

PROPOSED DREDGE DEPTH < 1.0m
VOLUME OF DREDGE = 2566m³
AREA OF DREDGE = 6223m²

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. CHART DATUM IS 2.25m BELOW ORDNANCE DATUM.
4. TIDE LEVELS:

HAT 5.3m	MLWN 1.7m
MHWS 4.6m	MLWS 0.8m
MHWN 3.5m	LAT −0.1m

5. FOR SOUTH CITADEL QUAY, LONGMAN QUAY AND NORTH LONGMAN QUAY DREDGE POCKETS REFER TO DRAWING 2021−322

LEGEND

DEPOSITS ABOVE −3.0m CD

RIVER DREDGE CHANNEL −3.0m CD OR BELOW

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
C	10.01.22	SETTING OUT POINTS ADDED	PM	TR	TR
B	07.01.22	AREA OF DREDGE ADDED	PM	TR	TR
A	06.10.21	COORDINATES OF 'AS DUG' GRAB SAMPLES ADDED	ADS	TR	TR

AMENDMENTS

CLIENT

PORT OF INVERNESS

PROJECT

HARBOUR ENGINEER

Wallace Stone
CONSULTING CIVIL ENGINEERS
GLASGOW 0141 554 8233 glasgow@wallacestone.co.uk
DINGWALL 01349 866775 dingwall@wallacestone.co.uk
HEBRIDES 01851 612454 hebrides@wallacestone.co.uk

DRAWING TITLE

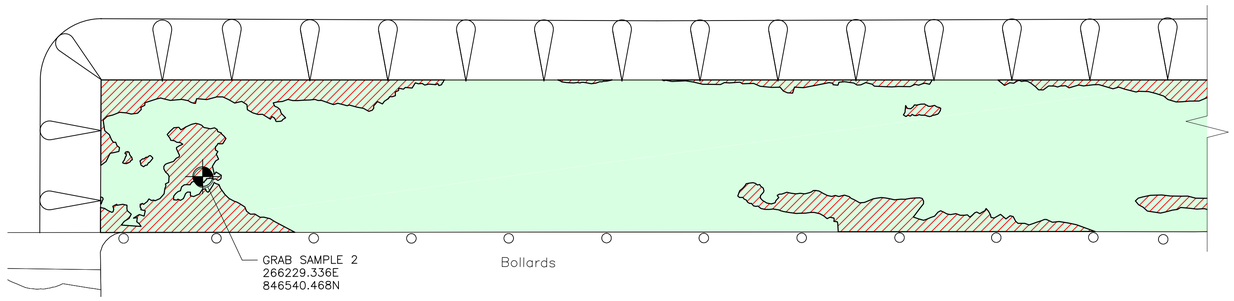
INVERNESS HARBOUR
MAINTENANCE DREDGE
RIVER NESS CHANNEL DREDGE

DRAWN	CHECKED	APPROVED
JHG	TR	TR
DATE 14.06.21	DATE 02.07.21	DATE 02.07.21

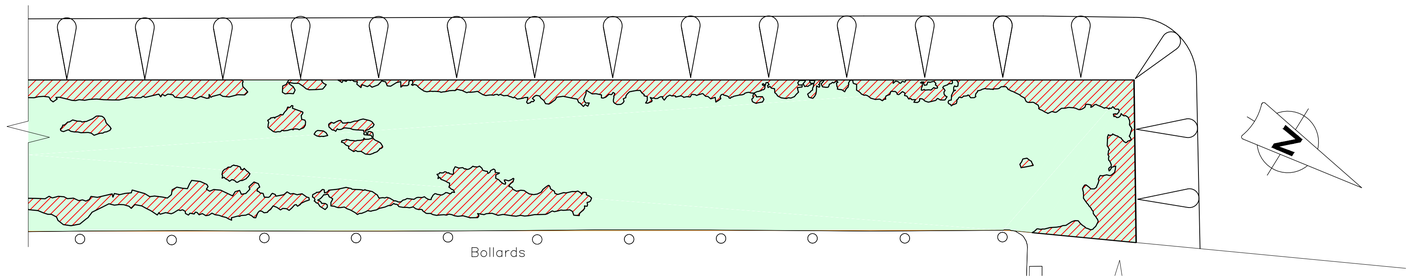
SCALE (A1) 1:1250 STAGE CONSENTS

REVISION A B C

PROJECT No. 2021 DRAWING No. 321

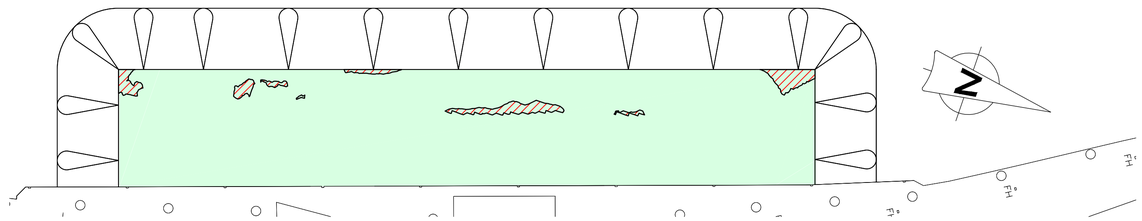


LONGMAN QUAY
SCALE 1:500



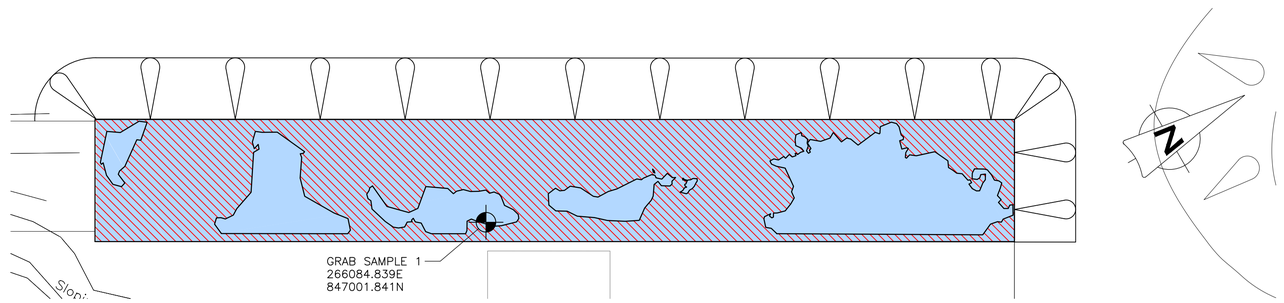
LONGMAN QUAY (CONTINUED)
SCALE 1:500

PROPOSED DREDGE DEPTH < 0.75m
VOLUME OF DREDGE = 221m³
AREA OF DREDGE = 1656m²



SOUTH CITADEL QUAY
SCALE 1:500

PROPOSED DREDGE DEPTH < 0.3m
VOLUME OF DREDGE = 7m³
AREA OF DREDGE = 70m²



NORTH LONGMAN QUAY
SCALE 1:500

PROPOSED DREDGE DEPTH < 0.75m
VOLUME OF DREDGE = 488m³
AREA OF DREDGE = 2090m³

0 10 20 30 40 50
SCALE 1:500 METRES

GENERAL NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. ALL LEVELS ARE IN METRES RELATIVE TO CHART DATUM UNLESS NOTED OTHERWISE.
3. CHART DATUM IS 2.25m BELOW ORDNANCE DATUM.
4. TIDE LEVELS:

HAT 5.3m	MLWN 1.7m
MHWS 4.6m	MLWS 0.8m
MHWN 3.5m	LAT −0.1m

5. FOR DREDGE POCKET LOCATIONS REFER TO DRAWING 2021−321

LEGEND

- DEPOSITS ABOVE −5.5m CD
- DREDGE POCKET −5.5m CD OR BELOW
- DEPOSITS ABOVE −5.0m CD
- DREDGE POCKET −5.0m CD OR BELOW

REV	DATE	DETAILS	DRAWN	CHK'D	APP'D
B	07.01.21	DREDGE AREA ADDED	PM	TR	TR
A	06.10.21	COORDINATES OF 'AS DUG' GRAB SAMPLES ADDED	ADS	TR	TR

AMENDMENTS

CLIENT
PORT OF INVERNESS

PROJECT
HARBOUR ENGINEER

Wallace Stone
Consulting Civil Engineers

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DRAWING TITLE
INVERNESS HARBOUR
MAINTENANCE DREDGE
RIVER NESS DREDGE POCKETS

DRAWN	CHECKED	APPROVED
JHG	TR	TR
DATE 14.06.21	DATE 02.07.21	DATE 02.07.21

SCALE (A1) 1:500
STAGE CONSENTS
REVISION A B

PROJECT No. 2021
DRAWING No. 322