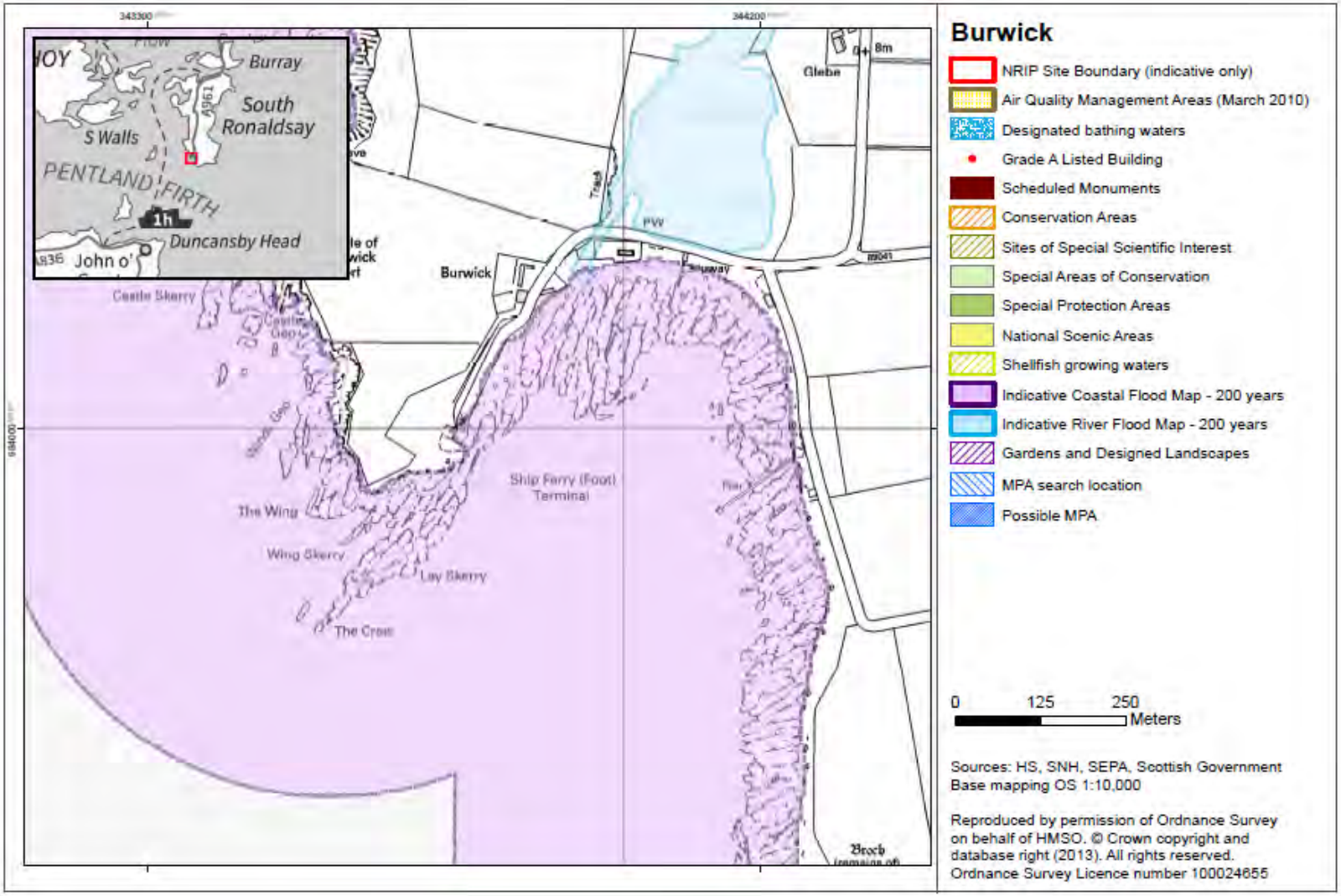
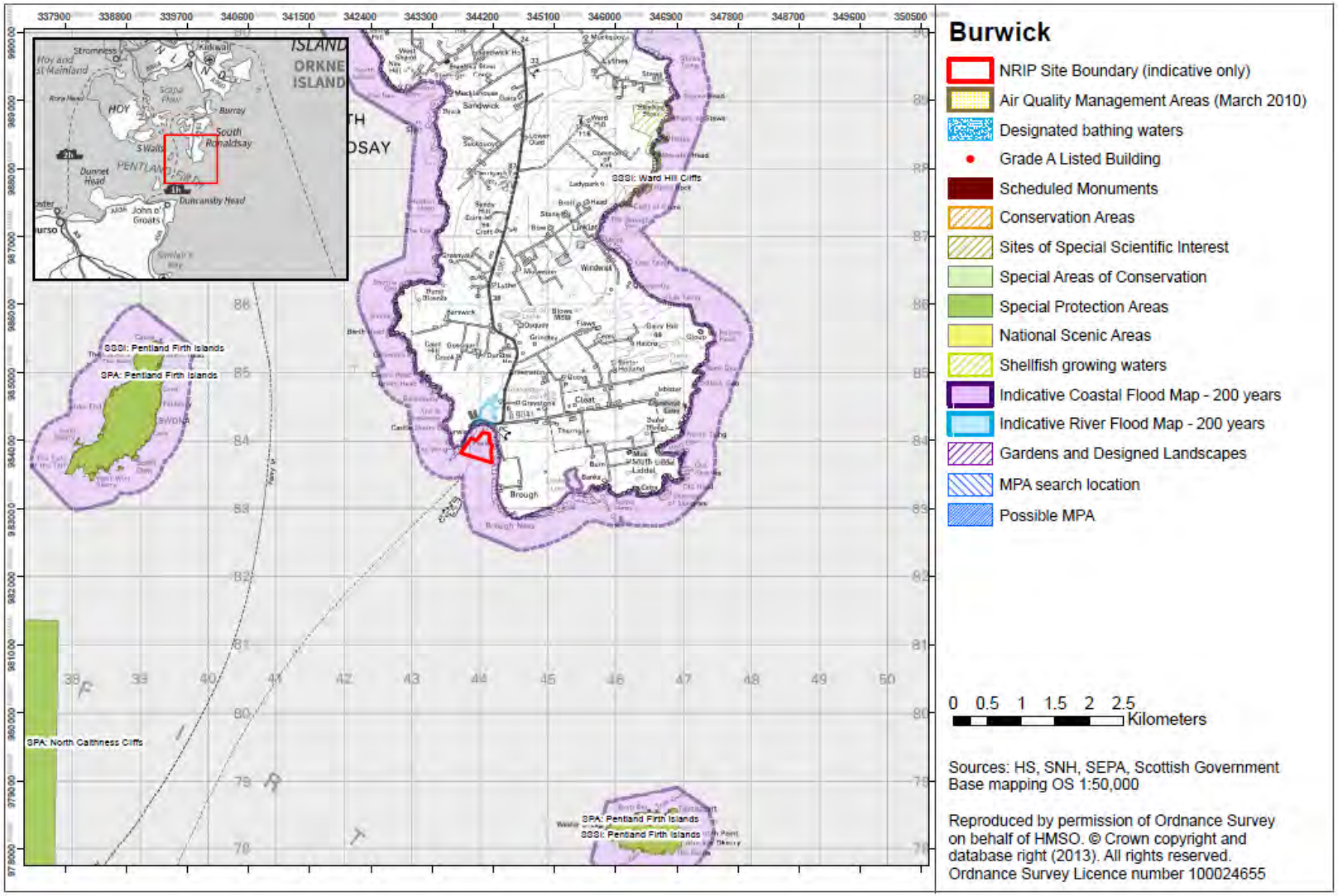
Appendix 4. MRIP Support Sites - Maps & Assessment Tables - Orkney

1. **Burwick**
2. **Hatston**
3. **Kirkwall**
4. **Lyness**
5. **St Margaret's Hope**
6. **Stromness (including Copland’s Dock)**

Site Map: Burwick



Wider Map: Burwick



Assessment Table: Burwick

SITE USE – Refuge/wet storage/unplanned maintenance.

POTENTIAL DEVELOPMENT

Refuge/Wet Storage/Unplanned Maintenance
For unplanned maintenance, it may be necessary to provide a portacabin (or similar) within the existing port. Few existing buildings appear available to re-use. No further infrastructure upgrade required.

There are three scenarios for wet storage:
(a) Company that manufactures the devices cannot store them as it needs the laydown space so the developer needs to move the devices to a wet storage site which is both close to the lease site and sheltered.
(b) The developer wants to store the devices close to the lease site until the installation vessel they wish to use is available, which means they store them in the loch.
(c) Refuge site needed when devices are being towed to the installation site and need to take shelter during bad weather (for a day or two) before resuming progress.
See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE - BURWICK

Biodiversity, Flora and Fauna –

Pentland Firth Islands SPA/SSSI – aggregations of breeding birds - Arctic tern (several islands, approximately 4.7 km west and 6 km south of Burwick).

Switha SPA/SSSI - aggregations of non-breeding birds – Greenland Barnacle goose (approximately 10 km north west of Burwick).

North Caithness Cliffs SPA - aggregations of breeding birds – seabird assemblage, fulmar, guillemot, kittiwake, peregrine, puffin, razorbill (approximately 7.5 km south-west of Burwick).

Seals – Potential designated haul-out site for both grey and harbour seals located throughout Orkney and around the Pentland Firth, the nearest being for grey seals at Gills Bay, Pentland Skerries, Mucke Skerry, Stroma North and Mell head Skerry to the south and south-west, and harbour seals at Ness of Quoys to the south-west[1]. Indications are that the Pentland Firth and Orkney waters are well used by both grey and harbour seals[2].

European Protected Species – Cetaceans are likely to be passing through the area. It is likely that otters are using this area.

[1] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.
[2] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]

ENVIRONMENTAL BASELINE - BURWICK

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[3].

Population / Human Health – Isolated residents in the environs of the harbour.

Water & Marine Environment – Coastal waters classification (2011): Good.

Climatic Factors – The site is within an Indicative 200 year Flood Zone

Air – No air quality issues identified.

Soil, Geology & Coastal Processes – Site is not within an area designated as a geological SSSI.
No sections of coastline in proximity to the harbour have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.). No significant areas of erosion or accretion have been identified in proximity to the harbour.

Cultural Heritage – There are two Listed Buildings approximately 250-300 m north-east of the harbour: St Mary's Kirk, kirkyard and kirkyard gateway (Church of Scotland) (South Ronaldsay) (Category B, Ref: 18715) and Burwick Farm, including ancillary buildings (Category B; Ref: Number 45661). There are no Scheduled Monuments near the harbour; the nearest is a chambered cairn 450 ESE of Isbister (No 2136).

There are several wrecks in the waters off Burwick.

Landscape / Seascape – No national designation in environs of Burwick Harbour. Hoy and West Mainland NSA is approximately 23.5 km north-west of Burwick.

Material Assets – There are no aquaculture sites off Burwick. The ferry between Burwick and John O'Groats operates from the harbour.

The waters around Burwick support demersal and pelagic fishing, some scallop dredging and diving, and the shellfish sector, both trawling (Nephrops) and static gear (Nephrops, crabs, lobsters). Fishing vessels do not appear to use the harbour.

The harbour does not appear to support recreational vessels. There are RYA light and medium recreational cruising routes between the mainland and South Ronaldsay. It is likely that recreational vessels sail along this coast past Burwick.

[3] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs

ENVIRONMENTAL BASELINE - BURWICK
Issues Scoped Out: *Population and Human Health* – There is likely to be increased boat traffic due to the movement of devices, which could result in noise and disturbance to local residents. However, given existing levels of boat movements, this effect is unlikely to be significant. *Air* – There is likely to be increased boat traffic due to the movement of devices, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects. *Soil, Geology & Coastal Processes* – Given the vessel movements and numbers of devices assumed for this assessment, it is considered unlikely that changes to wave patterns would be such that they would result in significant alterations of coastal processes or in significant impacts on soil and marine geology.

ASSESSMENT - BURWICK				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Biodiversity, Flora and Fauna Birds - Pentland Firth Islands SPA/SSSI; Switha SPA/SSSI; North Caithness Cliffs SPA, Areas of Search	Potential disturbance (vessel noise and human presence) from wet storage activities. Presence of new features likely to disturb and possibly displace birds from feeding.	Temporary, depending on location, duration and frequency of activity.	Time storage activities and vessel movements to avoid bird breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Seals	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out locations.	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of seals.	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near seal haul out locations during moulting times and breeding season if relevant.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
European Protected Species - Cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect overall population numbers/viability	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided

ASSESSMENT - BURWICK				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
European Protected Species - Otters	Potential disturbance of otters (noise during storage, physical presence of devices and human presence) from storage of devices.	Effects will be temporary but, depending on duration and frequency of storage, may be medium-term.	Devices should not be stored on or near habitat used by otters.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed. Introduction of devices into the waterbody.	Effects are likely to be localised and temporary	Increased turbidity: as above. No mitigation proposed for temporary morphological effects.	Increased turbidity: as above. Temporary morphological effects.
Climatic Factors Site is within an Indicative 200 year Flood Zone.	Potential to be at risk of flooding from the sea	This will be a permanent threat given the long-term impacts of climate change.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated with O&M.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	Vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Cultural Heritage Listed Buildings in the environs of the harbour.	Wet storage operations are unlikely to affect the setting of the listed buildings.	No effect	None required	None
Wreck sites	Storage of devices could affect wreck sites through destruction of features.	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Landscape/ seascape local residents	Residents in environs of Burwick are likely to have views of stored devices which are on or break the water surface.	Effects are likely to be local in nature and temporary, and are unlikely to be significant.	If necessary, locate devices in a sheltered bay away from overall views of the Pentland Firth.	Assuming mitigation is implemented, the potential for significant adverse visual effects should be reduced.

ASSESSMENT - BURWICK				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Material Assets Harbour access and Navigation	Possible effects on navigational safety, e.g. vessels. Devices could block access to the harbour and displace harbour users.	Collisions could result in injury/death of human beings, oil spills etc. Potential displacement of harbour activities.	Ensure that devices are located away from access points to the harbour. Wet storage sites will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority, and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Fishing grounds	Possible disturbance and/or displacement of local fishing grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing elsewhere	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
OTHER DEVELOPMENT None known.				
Cumulative Effects	Adverse cumulative effects are not anticipated at this site.			

Implications for development:

The following requires further examination at the project level:

- effects on birds and otters, particularly disturbance and/or displacement from feeding habitat. Early discussions should be held with SNH regarding timing, extent, location and duration of storage.
- risk of disturbance of seal haul out locations and corkscrew injury to seals.

- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce landscape/visual effects and effects on wrecks.
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

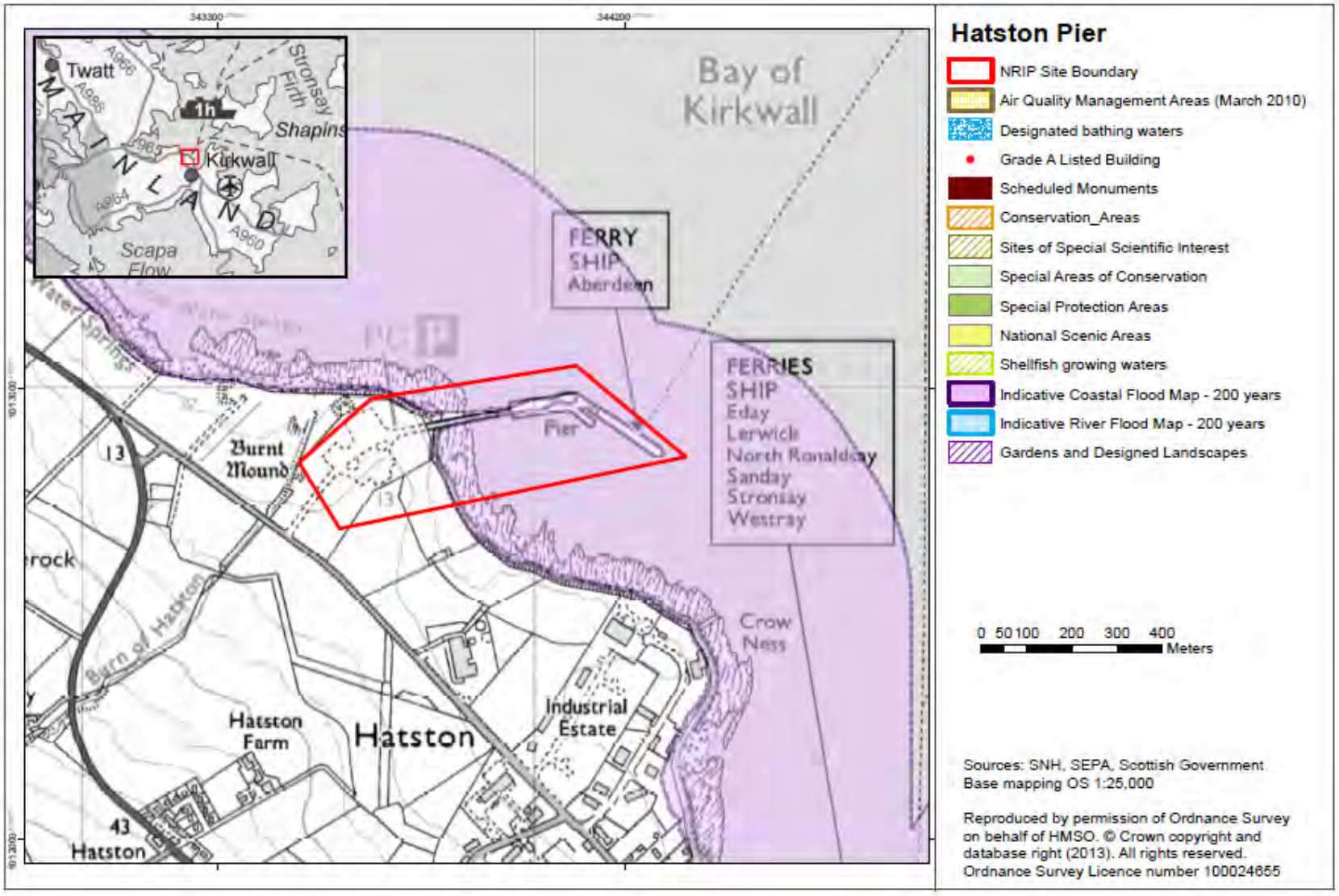
Habitats Regulations Appraisal

It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

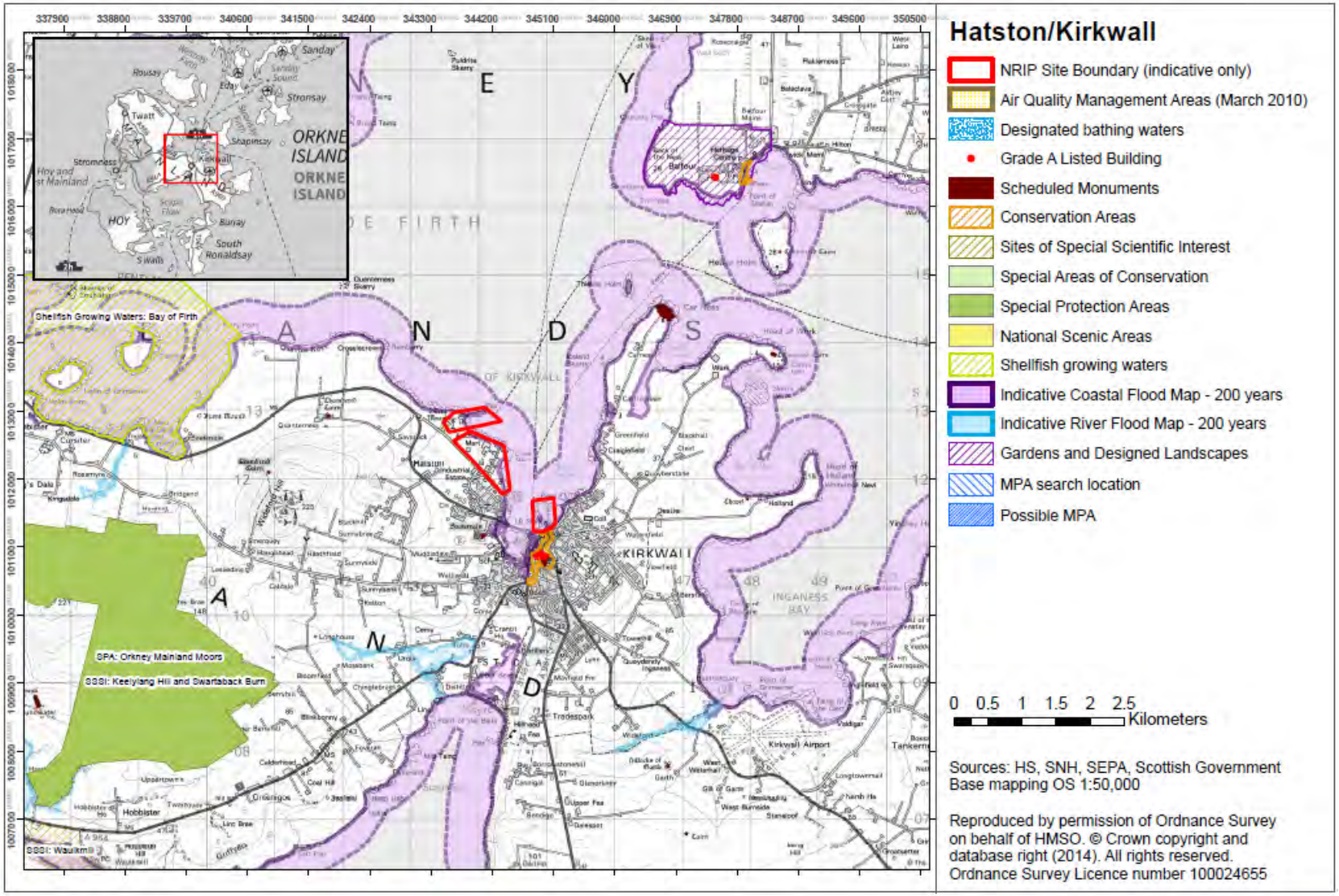
- disturbance of birds from noise and human presence
- disturbance of birds from wet storage of devices

Early discussions should be held with SNH.

Site Map: Hatston



Wider Map: Hatston



Assessment Table: Hatston

SITE USE – Possible manufacturing, Assembly/Construction and Installation; Operations and Maintenance

POTENTIAL DEVELOPMENT

Possible manufacturing

- Within the existing port, new buildings are likely to be required. (Few existing buildings appear available to re-use.) No further infrastructure upgrade required.
- Road/rail connections for manufacturing: A965 road connections, no rail – no upgrade required.

Assembly/Construction & Installation

- Within the existing port, new buildings are likely to be required. (Few existing buildings appear available to re-use.) No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

Operations & Maintenance

- Within the existing port, new buildings are likely to be required. (Few existing buildings appear available to re-use.) No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE - HATSTON

Biodiversity, flora and fauna –

Orkney Mainland Moors SPA – Occurs in two discrete areas to the west and north of Hatston. Aggregations of breeding birds – red-throated diver, short-eared owl; hen harrier (breeding and non-breeding).

Copinsay SPA/SSSI – aggregations of breeding birds – seabird assemblage, fulmar, Great black-backed gull, guillemot, kittiwake (approximately 6 km south-east of harbour). SSSI supports aggregations of breeding birds – seabird colony, guillemot and kittiwake.

Muckle and Little Green Holm SSSI – grey seal

Keelylang Hill and Swaraback Burn SSSI - Hen harrier, breeding bird assemblage and upland habitats assemblage (approximately 6 km south-west of harbour).

Waulkmill SSSI – littoral sediment (saltmarsh), invertebrates (Golden-rod case-bearer moth) and maritime cliff; approximately 7 km south-west of harbour.

ENVIRONMENTAL BASELINE - HATSTON

Orphir and Stenness Hills SSSI - Hen harrier, breeding bird assemblage and upland habitats assemblage (approximately 8 km south-west of harbour).

Rousay SPA – aggregations of breeding birds – seabird assemblage, Arctic skua, Arctic tern, fulmar, guillemot, kittiwake

Rousay SSSI - aggregations of breeding birds – seabird colony, guillemot, kittiwake, Arctic skua, Arctic tern; upland bogs (blanket bog); upland dwarf shrub heath (subalpine wet heath); mesotrophic loch; maritime cliff – approximately 16 km from Kirkwall

Loch of Stenness SAC – marine inshore sublittoral sediment – lagoons – approximately 13.5 km west of Kirkwall

Lochs of Harray and Stenness SSSI - aggregations of non-breeding birds – goldeneye, pochard, scaup, Tufted duck; marine inshore sublittoral sediment (saline lagoon); invertebrates – caddisfly, freshwater nerite snail; eutrophic loch – approximately 13.5 km west of Kirkwall

Seals – Potential designated haul-out site for both grey and harbour seals located throughout Orkney[4]. Indications are that the Orkney waters are well used by both grey and harbour seals[5].

European Protected Species – Cetaceans are likely to be passing through the area. Otters may be found using this area of coast.

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[6].

Population & Human Health – Harbour is at the west end of Kirkwall; closest residential area is approximately 0.5 km east of harbour.

Water & Marine Environment – Coastal waters classification (2011): Good.

Climatic Factors – The site is within an Indicative 200 year Flood Zone.

Air – No air quality issues identified.

Soil, Geology & Coastal Processes – Site is not within an area designated as a geological SSSI.

[4] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.
[5] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]
[6] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs (accessed 5/4/2014)

ENVIRONMENTAL BASELINE - HATSTON

Sections of the Wide Firth have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.), including several to the west and north of the pier. Accretion has been observed in the bay of Firth to the west (approximately 3 km west of the pier) and coastal erosion on the northern coastline of Shapinsay to the north east (approximately 8 km north east of the pier).

Cultural Heritage – There are no Scheduled Monuments or Listed Buildings on or in the environs of the site. There are several wrecks in the water off Hatston and further along the coast.

Landscape & Seascape – Harbour is not within a national designation. Hoy and West Mainland NSA is approximately 9 km west of Hatston.

Material Assets –Hatston serves as the ferry terminal for Northlink Ferries stopping in Orkney en route between Aberdeen and Lerwick. The pier is also used by cruise liners (approximately 70 per year). A 160 m extension to the existing 225 m pier was officially opened at the end of April 2013, making Hatston pier the longest commercial deepwater berth in Scotland[7].

There are no aquaculture interests in the waters off Hatston. The waters around Hatston support demersal and pelagic fishing, scallop dredging and shellfish (static gear -lobster, crab). There is a RYA heavy recreational cruising route that runs into Kirkwall; the nearest marine is also in Kirkwall.

Hatston Pier also supports the offshore renewable energy industry, wave and tidal in particular e.g. servicing marine energy activity at EMEC. Facilities have also been made available for developers through HIE. Hatston is included in the Low Carbon / Renewables North Enterprise Area, and funding has recently been received from the European Regional Development Fund (ERDF). The new Hatston Enterprise Area will eventually provide industrial space to meet the operational and maintenance requirements of the emerging marine energy sector. The project supported by the ERDF will see a new road built connecting the Hatston Enterprise Area to the Hatston Pier. The funding will also pay for the installation of utilities and drainage works[8].

Issues Scoped Out:
Population and Human Health – Site operations and likely increases in boat traffic due to the movement of devices could result in noise and disturbance to local residents. However, given existing levels of boat movements and existing site operations, this effect is unlikely to be significant.
Air – There is likely to be increased boat traffic due to the movement of devices, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects.
Soil, Geology & Coastal Processes – Given the vessel movements and numbers of devices assumed for this assessment, it is considered unlikely that changes to wave patterns would be such that they would result in significant alterations of coastal processes or in significant impacts on soil and marine geology.
Cultural Heritage – No historic environment features on or in the environs of the site.

[7] http://www.ports.org.uk/port.asp?id=887
[8] http://www.orkney.gov.uk/OIC-News/erdf-support-provides-road-forward-for-hatston-enterprise-area.htm

ASSESSMENT - HATSTON				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Biodiversity, Flora and Fauna Birds – Orkney Mainland Moors SPA, Copinsay SPA/SSSI, Keelylang Hill and Swaraback Burn SSSI, Orphir and Stenness Hills SSSI, Rousay SPA/SSSI, Areas of Search	Potential disturbance (vessel noise and human presence) from wet storage activities. Presence of new features may disturb and possibly displace birds from feeding.	Temporary, depending on location, duration and frequency of activity.	Time storage activities and vessel movements to avoid bird breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Lochs of Harray and Stenness SSSI	From available information, it does not appear that bird species using this SSSI (goldeneye, pochard, scaup, Tufted duck) would range as far as Hatston.	No effect	None required	None
Loch of Stenness SAC, Waulkmill SSSI	No mobile species interests. Sites will not be affected due to distance from pier.	No effect	None required	None
Seals including grey seal from Muckle and Little Green Holm SSSI	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out locations.	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of seals.	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near seal haul out locations during moulting times and breeding season if relevant.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
European Protected Species: Otters	Potential disturbance of otters (noise during storage, physical presence of devices and human presence) from storage of devices.	Effects will be temporary but, depending on duration and frequency of storage, may be medium-term.	Devices should not be stored on or near habitat used by otters.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.

ASSESSMENT - HATSTON				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
European Protected Species: cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect overall population numbers/viability	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed. Introduction of devices into the waterbody.	Effects are likely to be localised and temporary	Increased turbidity: as above. No mitigation proposed for temporary morphological effects.	Increased turbidity: as above. Temporary morphological effects.
Climatic Factors Site is within an Indicative 200 year Flood Zone	Potential to be at risk of flooding from the sea	This will be a permanent threat given the long-term impacts of climate change.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated with site activities.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	Vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Cultural heritage Wreck sites	It is unlikely that O&M works would affect existing wreck sites, given their location. Storage of devices could affect wreck sites through destruction of features.	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT - HATSTON				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Landscape/Seascape Hatston is east of Hoy and West Mainland NSA Local residents ~500 m away	It is unlikely that O&M operations and/or storage would affect the special qualities of the National Scenic Area, given the nature of the devices. Storage of devices which are on or break the water surface may have adverse local landscape and visual effects.	Effects are likely to be local in nature and temporary, and are unlikely to be significant.	At the local level, it may be desirable to locate devices in a sheltered bay away from Hatston/Kirkwall.	Assuming mitigation is implemented, the potential for significant adverse effects at the local level should be reduced.
Material Assets Harbour access and Navigation	Possible effects on navigational safety, e.g. ferries. Devices could block access to the harbour/ferry terminal and displace harbour users (e.g. require ferries to be re-routed).	Collisions could result in injury/death of human beings, oil spills etc. Inefficient operation of ferry terminal and/or ferries. Potential displacement of harbour activities.	Ensure that devices are located away from access points to the harbour. Wet storage site will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Fishing grounds	Possible disturbance and/or displacement of fishing from local grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing elsewhere	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT - HATSTON				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
OTHER DEVELOPMENT New road connecting the Hatston Enterprise Area to the Hatston Pier				
Cumulative	If mitigation measures are implemented, it is unlikely that adverse cumulative effects will occur.			

Implications for development:

The following requires further examination at the project level:

- effects on birds. Early discussions should be held with SNH regarding timing, extent, location and duration of wet storage.
- risk of disturbance to seal haul out location and corkscrew seal injuries.
- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce effects on landscape/seascape and/or wrecks
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

Early discussions should be held with SNH, SEPA, Historic Scotland, the Local Planning Authority, Harbour Authority, MCA, Inshore Fisheries Group and/or local fishermen, Royal Yachting Association Scotland, and other vessel operators as required.

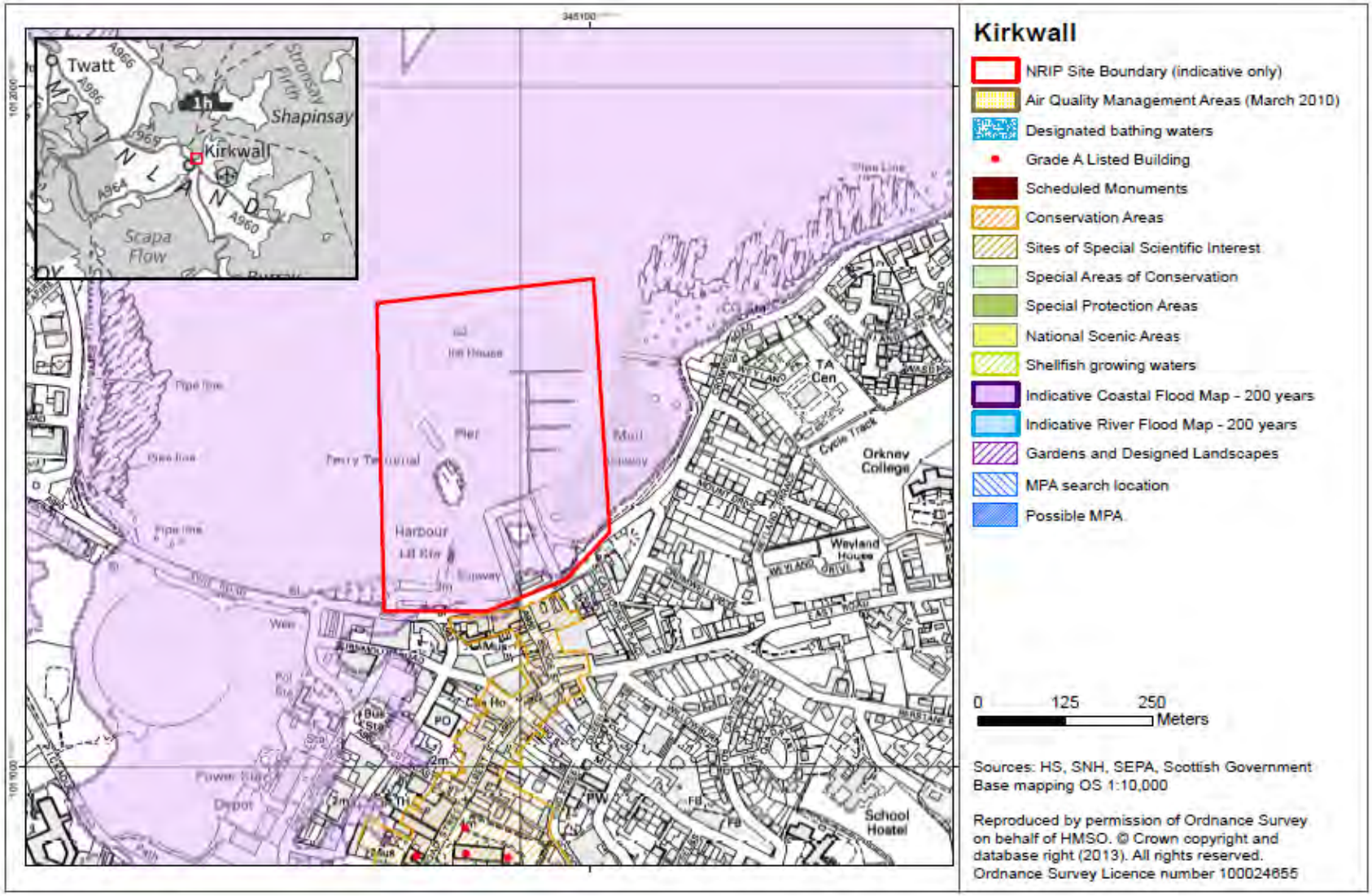
Habitats Regulations Appraisal

It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

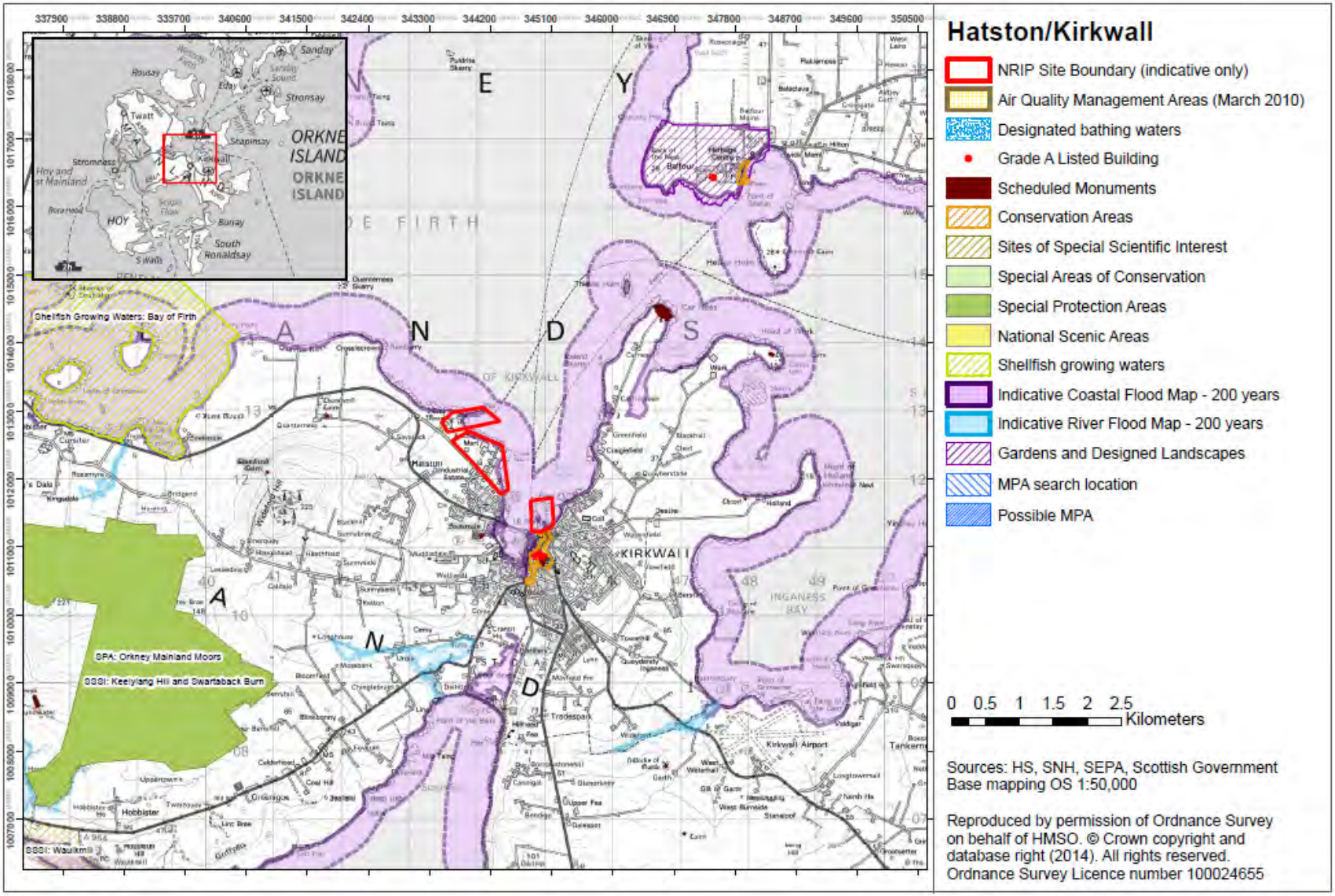
- effects of O&M and/or wet storage activities on birds from nearby SPAs.

Early discussions should be held with SNH.

Site Map: Kirkwall



Wider Map: Kirkwall



Assessment Table: Kirkwall

SITE USE – In support of Hatston, likely to be Operations and Maintenance

POTENTIAL DEVELOPMENT

Operations & Maintenance

- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE – KIRKWALL

Biodiversity, Flora and Fauna –

Orkney Mainland Moors SPA - Aggregations of breeding birds – red-throated diver, short-eared owl, hen harrier (breeding and non-breeding) (approximately 5 km south-east of harbour).

Keelylang Hill and Swaraback Burn SSSI - Hen harrier, breeding bird assemblage and upland assemblage (approximately 5 km south-east of harbour).

Seals – Potential designated haul-out site for both grey and harbour seals located throughout Orkney[9]. Indications are that the Orkney waters are well used by both grey and harbour seals[10].

European Protected Species – Cetaceans are likely to be passing through the area. Otters may be found using this area of coast.

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[11].

Population and Human Health – Harbour is located within residential area.

Water & Marine Environment – Coastal waters classification (2011): Good.

[9] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.

[10] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]

[11] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs (accessed 5/4/2014)

ENVIRONMENTAL BASELINE – KIRKWALL

Climatic Factors – The site is within an Indicative 200 year Flood Zone.

Air – No air quality issues identified.

Soil, Geology & Coastal Processes – Site is not within an area designated as a geological SSSI.
Sections of the Wide Firth have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.), including several to the west and north west of the pier. Accretion has been observed in the bay of Firth to the west (approximately 5 km west of the pier) and coastal erosion on the northern coastline of Shapinsay to the north east (approximately 9 km north of the pier).

Cultural Heritage – Listed Building Kirkwall Harbour Light (Category C Index Number 51038) and Harbour (Category B Index Number 46001) are located in the harbour. Various other Listed Buildings are located in nearby residential areas, the closest being on Ayre Road. Scheduled Monuments Bishop's Palace (SM90193) and Earl's Palace (SM90194) are located approximately 250 m south of harbour. Numerous recorded vessel and aircraft wreck sites are located within the Bay of Kirkwall to the north of the site, the nearest approximately 200 m north of the harbour.

Landscape / Seascape – No national designation.

Material Assets –Finfish farming interests have been identified in the area, the nearest approximately 5 km north-west of the harbour (Quanter Ness)[12]. Local fishing and recreational sailing interests use local harbour facilities, and ferry services to other islands in Orkney operate from the Harbour. Other ferry services, including those to Shetland and the Scottish mainland operate from a second port located approximately 1.5 km north-west of the site[13].

Issues Scoped Out –
Air – There is likely to be increased boat traffic due to O&M activities, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects.
Soil, Geology & Coastal Processes – Given the vessel movements and numbers of devices assumed for this assessment, it is considered unlikely that changes to wave patterns would be such that they would result in significant alterations of coastal processes or in significant impacts on soil and marine geology.

[12] Marine Scotland (2013) National Marine Plan Interactive.
[13] The Scottish Government (2011) Scotland's Marine Atlas: Information for the National Marine Plan, pg. 153, 173.

ASSESSMENT – KIRKWALL				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Biodiversity, Flora and Fauna Birds – Orkney Mainland Moors SPA, Keelylang Hill and Swaraback Burn SSSI, Areas of Search	Potential disturbance (vessel noise and human presence) from wet storage activities. Presence of new features likely to disturb and possibly displace birds, e.g. red-throated divers, from feeding.	Temporary, depending on location, duration and frequency of activity.	Time storage activities and vessel movements to avoid bird breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Seals	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out locations.	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of seals.	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near seal haul out locations during moulting times and breeding season if relevant.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
European Protected Species: Otters	It is unlikely that proposed activities will add significantly to existing levels of noise and disturbance, due to the nature of existing activities in the harbour. Otters will not be significantly affected (if they are using the harbour area).	No effects	None required.	None.
European Protected Species: cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect overall population numbers/viability	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided

ASSESSMENT – KIRKWALL				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Population and Human Health Residential developments within 100 m of site.	Noise disturbance during site operations. Due to the nature of existing activities in the harbour, it is unlikely this will add significantly to existing levels of noise and disturbance.	Localised	Site protocols and/or good neighbour agreements would set out conditions for controlling noise and/or disturbance from construction activities and site operations.	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed could affect shellfish growing waters.	Effects are likely to be localised and temporary.	Developers should consider whether there are anchoring methods which would not result in increased turbidity.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
Climatic Factors Site is within the Indicative 200 year Flood Zone.	Potential for Kirkwall Pier and surrounds to be at risk of flooding from the sea.	This will be a permanent threat given the long-term impacts of climate change and the potential volatility this could have on micro-climates.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated with O&M.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	O&M vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from O&M vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Cultural Heritage Listed Buildings, Scheduled Monuments and historic features in the environs of the site.	As no new infrastructure is required, effects on the site or setting of these features are not anticipated.	No effect	None required	None
Wreck sites	It is unlikely that site operations would affect existing wreck sites, given their location. Storage of devices could affect wreck sites through destruction of	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT – KIRKWALL				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
	features.			
Landscape/Seascape residential area nearby	Residents with views of the Bay of Kirkwall are likely to have views of stored devices which are on or break the water surface.	Effects are likely to be local in nature and temporary, and are unlikely to be significant.	If necessary, locate devices in sheltered bays away from overall views of the Bay of Kirkwall.	Assuming mitigation is implemented, the potential for significant adverse visual effects should be reduced.
Material Assets	Possible effects on navigational safety, e.g., ferries.	Collisions could result in injury/death of human beings, oil spills etc.	Ensure that devices are located away from access points to the harbour. Wet storage site will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Harbour access	Devices could block access to the pier/terminal and displace harbour users (e.g. delay or require other vessels to be re-routed).	Inefficient operation of ferry terminal and/or ferries. Potential displacement of harbour activities.		
Fishing grounds	Possible disturbance and/or displacement of local fishing grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing elsewhere	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT – KIRKWALL				
Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Shellfish and finfish interests	Possible damage to existing aquaculture infrastructure, e.g. in the event of devices breaking loose.	Permanent loss of equipment/facilities	Storage sites will need to be located away from aquaculture sites. Liaison with The Crown Estate and aquaculture operators to agree a suitable distance.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
OTHER DEVELOPMENTS Ferry services and other marine users (e.g. fishing and recreational vessels) operating within the Bay of Kirkwall.				
Cumulative	Possible cumulative effect with existing vessel traffic within the Bay of Kirkwall and activities at the harbour. Potential for cumulative effects on breeding birds and on marine mammals (i.e. corkscrew seal injuries). However, significant adverse effects potentially arising from site operations could be avoided through appropriate mitigation.			

Implications for development:

The following requires further examination at the project level:

- effects on breeding birds, particularly disturbance and/or displacement from feeding habitat.
- risk of disturbance to seal haul out locations and corkscrew injury to seals.
- preparation and agreement of construction protocols/good neighbour agreements.
- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce landscape/visual effects and effects on historic environment, including wrecks.
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

Early discussions should be held with SNH, SEPA, Historic Scotland, the Local Planning Authority, Harbour Authority, MCA, Inshore Fisheries Group and/or local fishermen, Coastguard, Royal Yachting Association Scotland and other vessel operators as required.

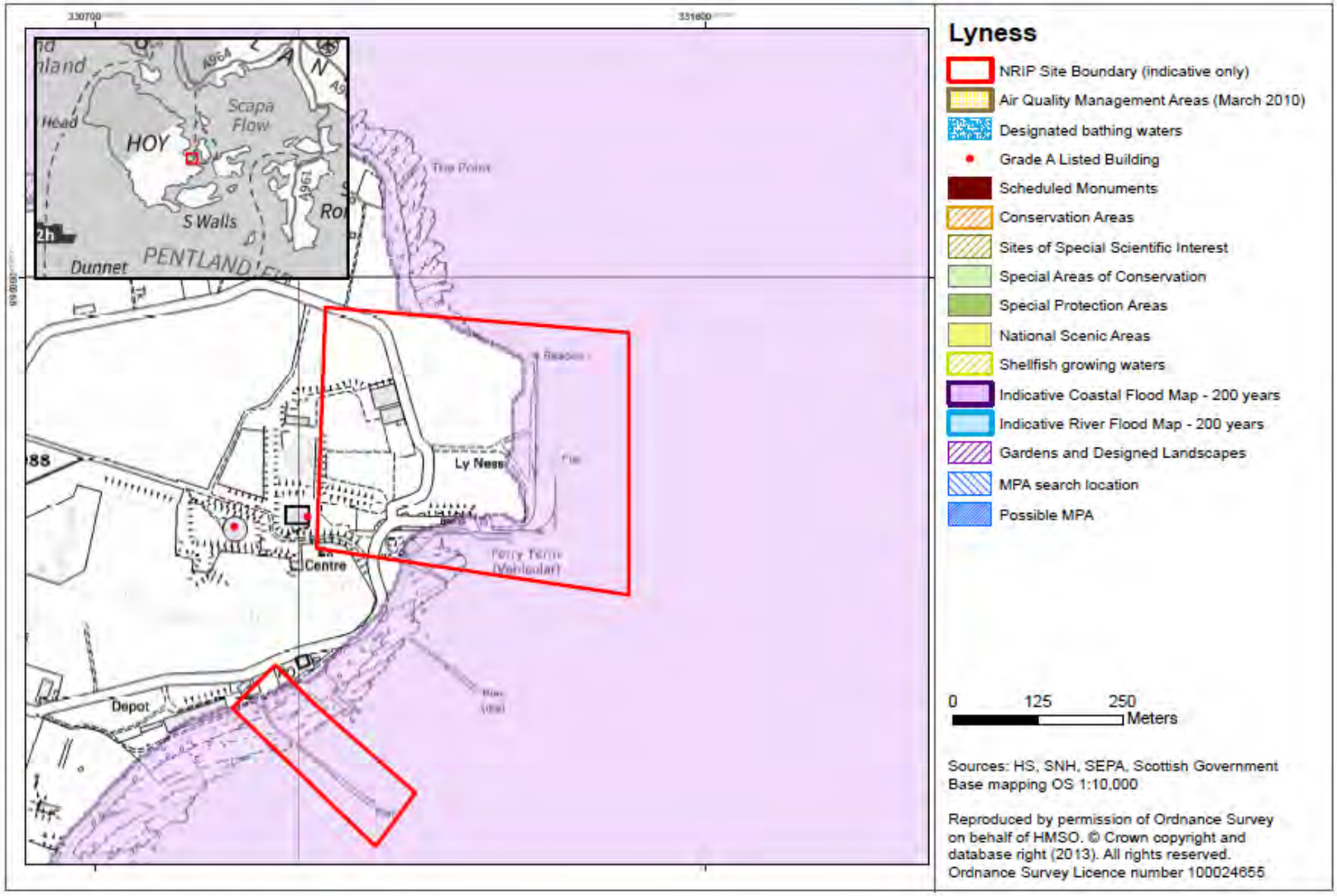
Habitats Regulations Appraisal

It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

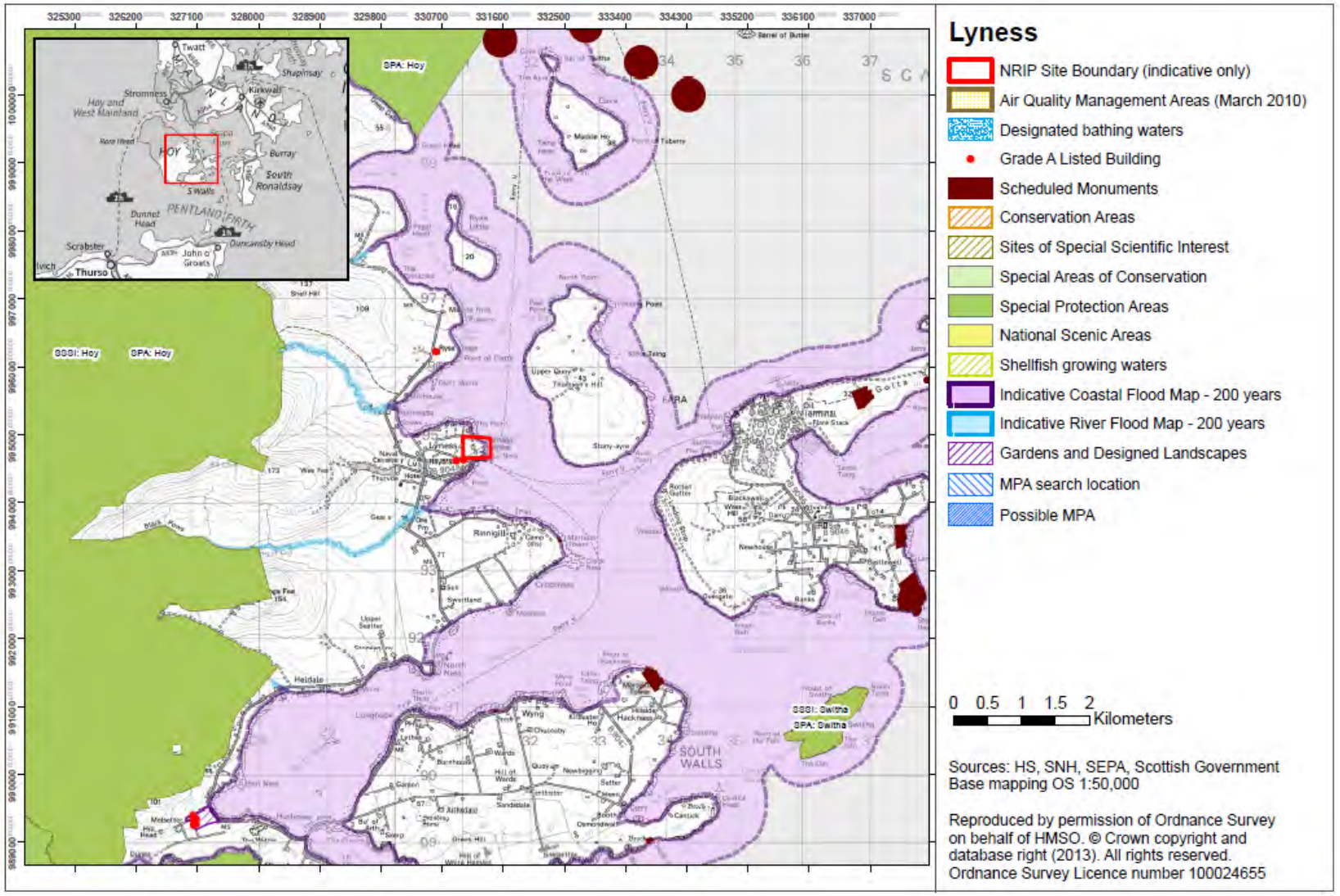
- effects on birds using nearby SPA habitats.

Early discussions should be held with SNH.

Site Map: Lyness



Wider Map: Lyness



Assessment Table: Lyness

SITE USE – Manufacturing, Assembly/Construction and Installation, Operations and Maintenance

POTENTIAL DEVELOPMENT

Manufacturing
- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- 'B' road connections, no rail. Road upgrade would be required; assume that raw materials are to be transported by vessel direct to the port.

Assembly/Construction & Installation
- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

Operations & Maintenance
- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE – LYNESS

Biodiversity, flora and fauna –

Hoy SSSI - Breeding birds and bogs – fulmar, great skua, great black-backed gull, arctic skua, seabird colony, guillemot, peregrine, red-throated diver, breeding bird assemblage and blanket bog (approximately 3 km west of pier).

Hoy SPA - Aggregations of breeding birds – red-throated diver, kittiwake, peregrine, puffin, seabird assemblage, great skua, great black backed gull, guillemot, artic skua and fulmar (approximately 3 km west of pier).

Hoy SAC - Blanket bog, dry heaths, wet heathland with cross-leaved heath, base-rich fens, hard-water springs depositing lime, pants in crevices on base rich rocks, alpine and subalpine heaths, acid peat stained lakes and ponds and vegetated sea cliffs (approximately 3 km west of pier).

Switha SPA and SSSI – Aggregations of non-breeding birds – Greenland barnacle goose (approximately 6 km south-east of pier).

Seals – Potential designated haul-out site for both grey and harbour seals are located throughout Orkney and the Pentland Firth, the nearest being for harbour seals at Switha, Cava in Scapa Flow and Butter Mirkady[14]. Indications are that the Orkney waters are well used by both grey and harbour seals[15].

[14] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.

ENVIRONMENTAL BASELINE – LYNESS

European Protected Species – Cetaceans are likely to be passing through the area. Otters may be found using this area of coast.

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[16].

Population and Human Health – Harbour is isolated with closest residential area approximately 0.5 km west of harbour

Water & Marine Environment – Coastal waters classification (2011): Good.

Climatic Factors – The site is within an Indicative 200 year Flood Zone.

Air – No air quality issues identified.

Soil, Geology & Coastal Processes – Site is not within an area designated as a geological SSSI.
Sections of Hoy's eastern coastline, and that of nearby islands (i.e. Fara, Flotta), have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.). Coastal erosion has been observed at Mill Bay (approximately 1 km north of the pier), Ore Bay (immediately south of the pier) and on the west coasts of Fara (approximately 1 km east of the pier) and Flotta (approximately 2.5 km south east of the pier).

Cultural heritage – Listed Buildings include Lyness Pier (Royal Naval Oil Terminal) (Category C Index Number 48349) currently being used as the ferry terminal, a former metal industrial shed (Category B Index Number 48356) located approximately 250 m south-west of existing quay, Romney hut (Royal Naval Oil Terminal (Category C Index Number 48357) located approximately 250 m west of existing pier, and Scapa Flow Visitor Centre, former steam pumping station and oil storage tank (Category A Index Number 50533) located approximately 250 m west of existing pier.
National Monuments Records Motor fishing vessel "Mara" (sank 1995) (ND39SW.8011.) immediately adjacent to southern end of pier. Many other recorded wrecks are located within Gutter Sound and other waters to the north and south of the site.

Landscape / Seascape – No national designation in environs of Lyness Harbour. Hoy and West Mainland NSA is approximately 6 km north-west of Lyness.

Material Assets – Fishing and recreational vessel utilise harbour facilities and ferry services operate out of the Ferry Terminal. Shellfish and finfish aquaculture interests are located in nearby waters, the nearest being located in Mill Bay approximately 1.5 km north-west of the pier (Mill Bay Shellfish farm)

[15] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]

[16] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs (accessed 5/4/2014)

ENVIRONMENTAL BASELINE – LYNESS
and in Gutter Sound approximately 1 km north-east of the pier (Fara West Finfish farm). **Issues Scoped Out:** *Population and Human Health* – There is likely to be increased boat traffic due to site activities, which could result in noise and disturbance to local residents. However, given existing levels of boat movements including that of Ferries using the pier, this effect is unlikely to be significant. *Air* – There is likely to be increased boat traffic due to site activities, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects.

ASSESSMENT – LYNESS				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Biodiversity, Flora and Fauna Birds including red-throated diver – Hoy SSSI/SPA, Switha SPA/SSSI, Areas of Search.	Potential disturbance (noise and human presence) from construction of shed/storage activities and associated activities. Due to the scale of the development it is unlikely this will be significant in construction or operational terms. Potential disturbance (vessel noise and human presence) from wet storage activities. Presence of new features likely to disturb and possibly displace red-throated divers from feeding.	Temporary, depending on location, duration and frequency of activity.	Time construction activities and vessel movements to avoid breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
Hoy SAC	Site is unlikely to be affected due to distance from pier.	No effects.	None required.	None.
Seals	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.

ASSESSMENT – LYNESS				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
	locations.	seals.	seal haul out locations during moulting times and breeding season if relevant.	
European Protected Species: Otters	Potential disturbance of otters (noise during storage, physical presence of devices and human presence) from storage of devices.	Effects will be temporary but, depending on duration and frequency of storage, may be medium-term.	Devices should not be stored on or near habitat used by otters.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
European Protected Species: cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect overall population numbers/viability	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed. Introduction of devices into the waterbody.	Effects are likely to be localised and temporary	Increased turbidity: as above. No mitigation proposed for temporary morphological effects.	Increased turbidity: as above. Temporary morphological effects.
Climatic Factors Site is within the Indicative 200 year Flood Zone.	Potential for the pier and coastline at Lyness to be at risk of flooding from the sea.	This will be a permanent threat given the long-term impacts of climate change and the potential volatility this could have on micro-climates.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated with installation and O&M.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	Vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Soil, Geology & Coastal Processes Wave patterns and coastal processes	Site activities on land will not affect wave patterns and coastal processes. Given the vessel movements	No significant adverse effect	None required	None

ASSESSMENT – LYNESS				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
	and numbers of devices assumed for this assessment, it is unlikely that changes to wave patterns would be such that they would result in significant alterations of coastal processes.			
Cultural Heritage Listed buildings and other historic features in the environs of the site.	Storage of devices which are on or break the water surface is unlikely to affect the setting of the listed buildings or other historic features.	No effect	None required	None
Wreck sites	Storage of devices could affect wreck sites through destruction of features.	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Landscape/Seascape Local views	Residents with views of Gutter Sound are likely to have views of stored devices which are on or break the water surface.	Effects are likely to be local in nature and temporary, and are unlikely to be significant.	If necessary, locate devices away from areas with overall views of Gutter Sound. This could affect the SPA/SAC/SSSI biodiversity features and locations should be selected to avoid this.	Assuming mitigation is implemented, the potential for significant adverse visual effects should be reduced.
Material Assets Harbour access and Navigation	Possible effects on navigational safety, e.g. vessels. Devices could block access to the harbour and displace harbour users.	Collisions could result in injury/death of human beings, oil spills etc. Potential displacement of harbour activities.	Ensure that devices are located away from access points to the harbour. Wet storage sites will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority, aquaculture operators and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT – LYNESS				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Fishing grounds	Possible disturbance and/or displacement of local fishing grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing elsewhere	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Shellfish and finfish interests	Possible damage to existing aquaculture infrastructure, e.g. in the event of devices breaking loose.	Permanent loss of equipment/facilities	Storage sites will need to be located away from aquaculture sites. Liaison with The Crown Estate and aquaculture operators to agree a suitable distance.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
OTHER DEVELOPMENT Other harbour users including fishing and recreational vessels. Ferry services operating from the harbour and aquaculture sites/operators in proximity to the site and wet storage areas.				
Cumulative Effects	Possible cumulative effect with existing operations around Lyness Harbour including ferry services, fishing and recreational vessels, aquaculture activities, etc. Potential for cumulative effects on birds using nearby SPA and SSSI habitat, and on marine mammals (i.e. corkscrew seal injuries). However, significant adverse effects potentially arising from site operations could be avoided through appropriate mitigation.			

Implications for development:
The following requires further examination at the project level:

- effects on birds using harbour from nearby SPA and SSSI habitat. It is likely that pre-storage bird survey will be a requirement of the marine licensing process. Early discussions should be held with SNH regarding construction activities, timing, extent, location and duration of works.
- risk of disturbance to seal haul out locations and corkscrew injury to seals
- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce landscape/visual effects and effects on historic environment, including wrecks.
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

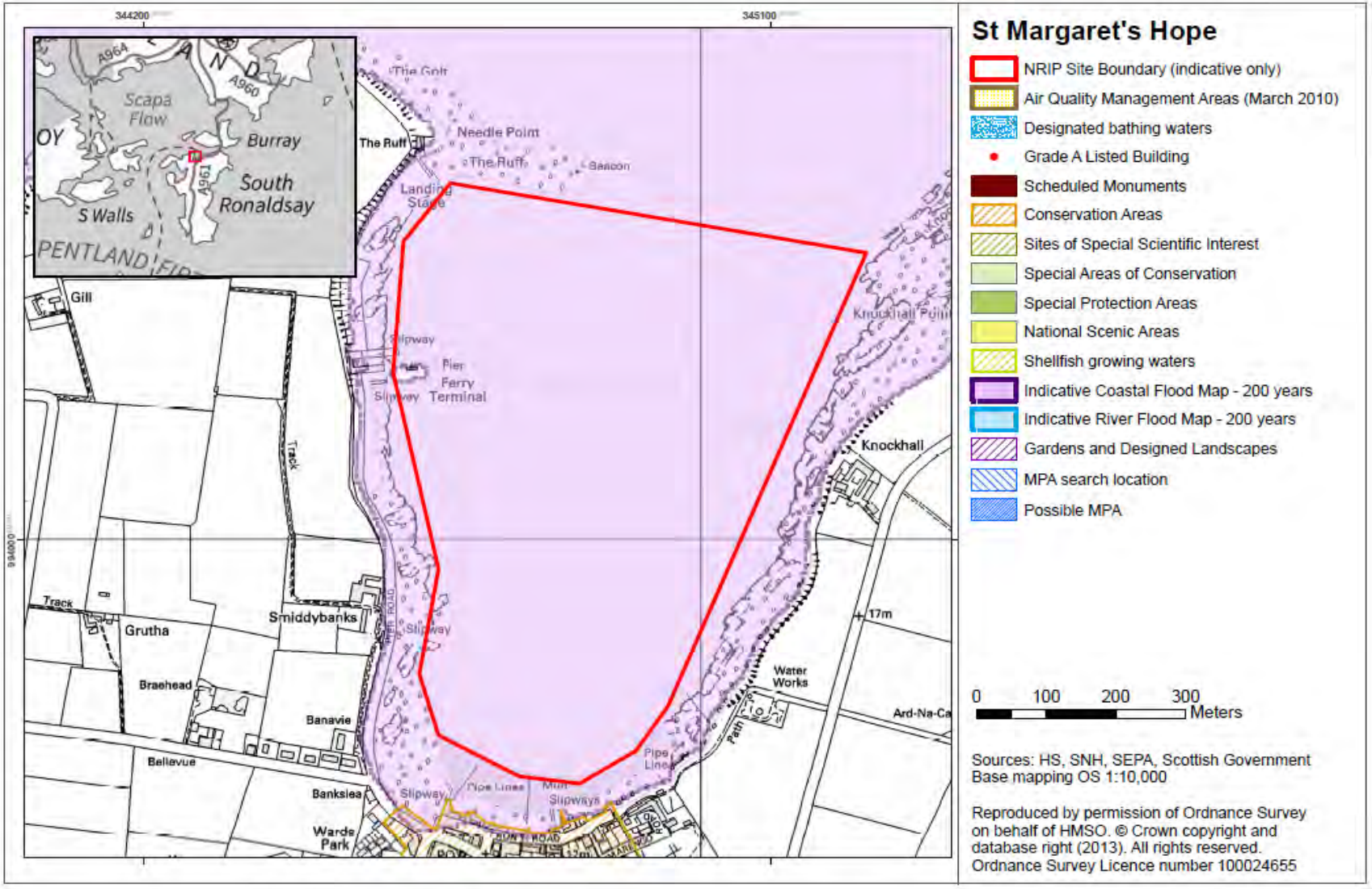
Early discussions should be held with SNH, SEPA, Historic Scotland, the Local Planning Authority, Harbour Authority, MCA, Inshore Fisheries Group and/or local fishermen, aquaculture operators, Royal Yachting Association Scotland and other vessel operators as required.

Habitats Regulations Appraisal
It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

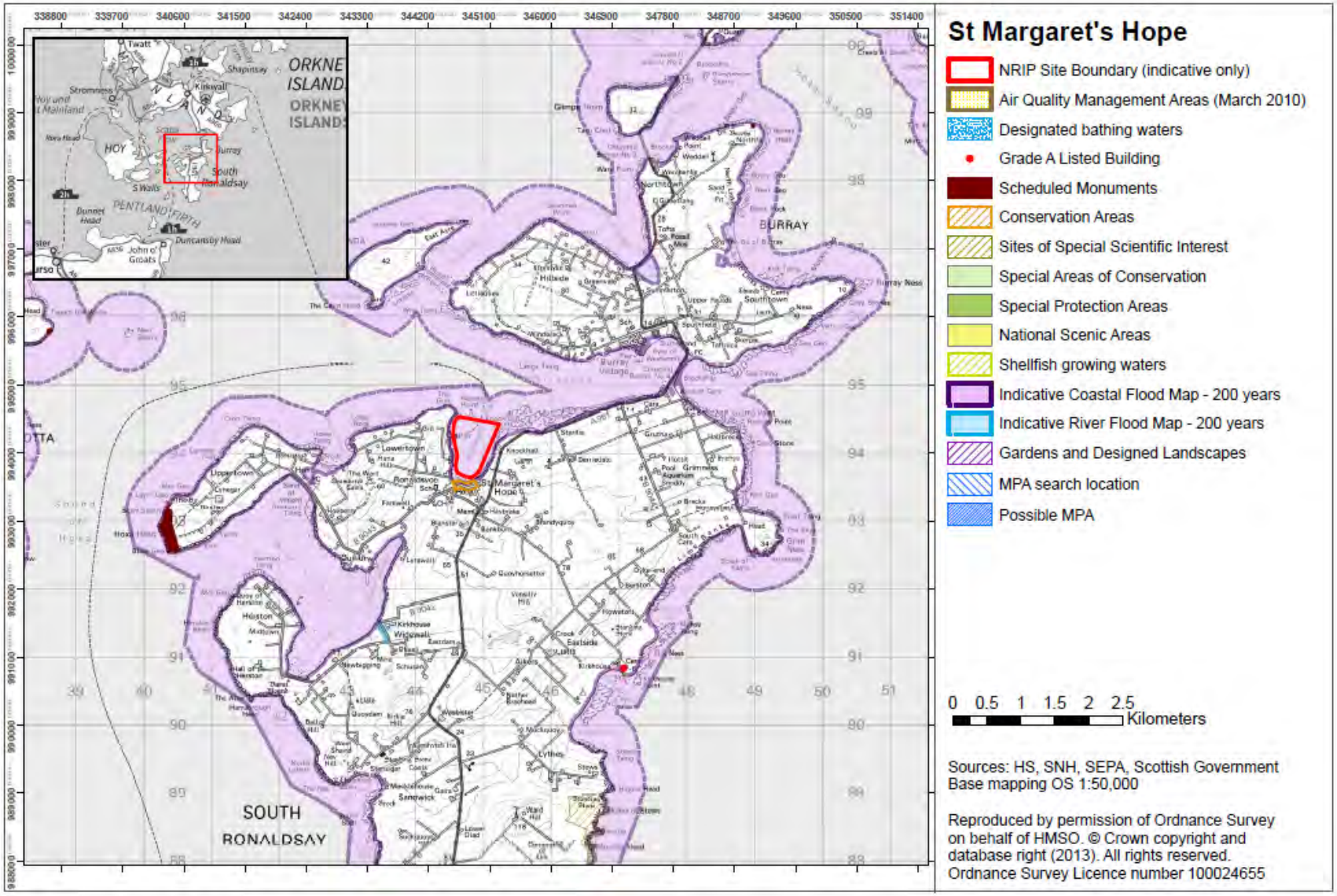
- effects of construction and site activities on birds using habitat within the SPA.

Early discussions should be held with SNH.

Site Map: St Margaret's Hope



Wider Map: St Margaret's Hope



Assessment Table: St Margaret's Hope

SITE USE – Operations and Maintenance; Refuge/ wet storage/ unplanned maintenance

POTENTIAL DEVELOPMENT

Operations & Maintenance

- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE – ST MARGARET'S HOPE

Biodiversity, flora and fauna –

Seals – Potential designated haul-out site for both grey and harbour seals located throughout Orkney, the nearest being for harbour seals at Switha, Cava and Butter Mirkady in Scapa Flow to the west and north-west[17]. Indications are that the Orkney waters are well used by both grey and harbour seals[18].

European Protected Species – Cetaceans are likely to be passing through the area. Otters may be found using this area of coast.

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[19].

Population and Human Health – Dwellings located in coastal areas around St Margaret's Hope and Knockhall will have views of the pier and the site.

Water and marine environment – Coastal waters classification (2011): Good.

Climatic Factors – The site is within an Indicative 200 year Flood Zone.

Air – No air quality issues identified.

[17] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.
[18] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]
[19] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs (accessed 5/4/2014)

ENVIRONMENTAL BASELINE – ST MARGARET'S HOPE

Soil, Geology & Coastal Processes – Ward **Hill Cliffs SSSI** (Supralittoral Coast Maritime cliffs) are located approximately 5 km south-east of the site.
Much of the northern coastline of South Ronaldsay, and the southern coastline of Burray to its north, have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.). Coastal erosion has been observed on the east coast of St Margaret's Hope (approximately 500 m east of the pier) and further along the coast to the east, around Gill Bay to the west (approximately 1 km north west of the pier), and on the southern coast of Burray (approximately 1.5 km north east of the pier).

Cultural heritage – Category B and C Listed Buildings have been identified within St Margaret's Hope including Harbour View (ID 50149) and St Margaret's House (ID 18722), and along Pier Road halfway between St Margaret's Hope and the Ferry Terminal.
St Margaret's Hope Ferry Terminal (Canmore ID 297833) and adjacent Royal Naval Mining Base (Canmore 202239) are just two of the many recorded sites located around the coast near to the proposed site.
Eight wreck sites have been identified within St Margaret's Hope and inside the proposed site boundary, and a further two recorded wrecks have been identified to the north within Water Sound.

Landscape / Seascape – No national designation identified.

Material Assets – St Margaret's Hope Ferry Terminal is located within the site boundary and is currently used by Pentland Ferries operating services between St Margaret's Hope and Gills Bay. Local fishing and recreational interests (e.g. sailing) use local harbour facilities.

Issues Scoped Out:
Air – There is likely to be increased boat traffic due to O&M activities, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects.

ASSESSMENT – ST MARGARET'S HOPE

Environmental Receptor	Effect	Characteristic	Mitigation	Residual Effects
Biodiversity, Flora and Fauna	Potential disturbance (vessel noise and human presence) from wet storage activities. Presence of new features likely to disturb and possibly displace birds.	Temporary, depending on location, duration and frequency of activity.	Time storage activities and vessel movements to avoid breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Waterbirds – Areas of Search				

ASSESSMENT – ST MARGARET'S HOPE				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Seals	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out locations.	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of seals.	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near seal haul out locations during moulting times and breeding season if relevant.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
European Protected Species: Otters	Potential disturbance of otters (noise during storage, physical presence of devices and human presence) from storage of devices.	Effects will be temporary but, depending on duration and frequency of storage, may be medium-term.	Devices should not be stored on or near habitat used by otters.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
European Protected Species: cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect overall population numbers/viability	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided
Population / Human Health Residential developments with views of the pier and site.	Noise disturbance during site operations.	Effects are likely to be localised	Site operation protocols and/or good neighbour agreements would set out conditions for controlling noise and/or disturbance from activities.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed. Introduction of devices into the waterbody.	Effects are likely to be localised and temporary	Increased turbidity: as above. No mitigation proposed for temporary morphological effects.	Increased turbidity: as above. Temporary morphological effects.

ASSESSMENT – ST MARGARET'S HOPE				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Climatic Factors Site within designation on SEPA Indicative Flood Map 200 years	Potential for St Margaret's Hope Ferry Terminal and Pier to be at risk of flooding from the sea.	This will be a permanent threat given the long-term impacts of climate change.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated with O&M.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	Vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Soil, Geology & Coastal Processes Maritime cliffs - Ward Hill Cliffs SSSI.	Given the distance from the site, O&M activities and short-term anchorage or storage of devices is unlikely to result in significant adverse effects on these features.	No significant adverse effect	None required	None
Wave patterns and coastal processes	Site activities on land will not affect wave patterns and coastal processes. Given the vessel movements and numbers of devices assumed for this assessment, it is unlikely that changes to wave patterns would be such that they would result in significant alterations of coastal processes.	No significant adverse effect	None required	None
Cultural Heritage Listed Buildings and historic features on and in the site environs	O&M activities will use existing infrastructure and buildings. No effect on the site and setting of listed buildings is therefore likely.	No effects	None required	None

ASSESSMENT – ST MARGARET'S HOPE				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Wreck sites	It is unlikely that O&M works would affect existing wreck sites, given their location. Storage of devices could affect wreck sites through destruction of features.	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Landscape / Seascape local residents	Residents in St Margaret's Hope are likely to have views of stored devices which are on or break the water surface.	Effects are likely to be local in nature and temporary, and are unlikely to be significant.	If necessary, locate devices away from residential areas and overall views of St Margaret's Hope.	Assuming mitigation is implemented, the potential for significant adverse visual effects should be reduced.
Material Assets	Possible effects on navigational safety. Devices could block access to the harbour/ferry terminal and displace harbour users (e.g. require ferries to be re-routed).	Collisions could result in injury/death of human beings, oil spills etc. Inefficient operation of ferry terminal and/or ferries. Potential displacement of harbour activities.	Ensure that devices are located away from access points to the harbour. Wet storage site will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Harbour access				
Fishing grounds	Possible disturbance and/or displacement of local fishing grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing elsewhere	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT – ST MARGARET'S HOPE				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
OTHER DEVELOPMENTS Ferry services and other marine users (e.g. fishing and recreational vessels) utilise harbour facilities in St Margaret's Hope.				
Cumulative Effects	Possible cumulative effects with existing vessel traffic and anchorages in and around the harbour identified. Assuming mitigation is implemented, the risk of significant adverse cumulative effects should be reduced.			

Implications for development:
The following requires further examination at the project level:

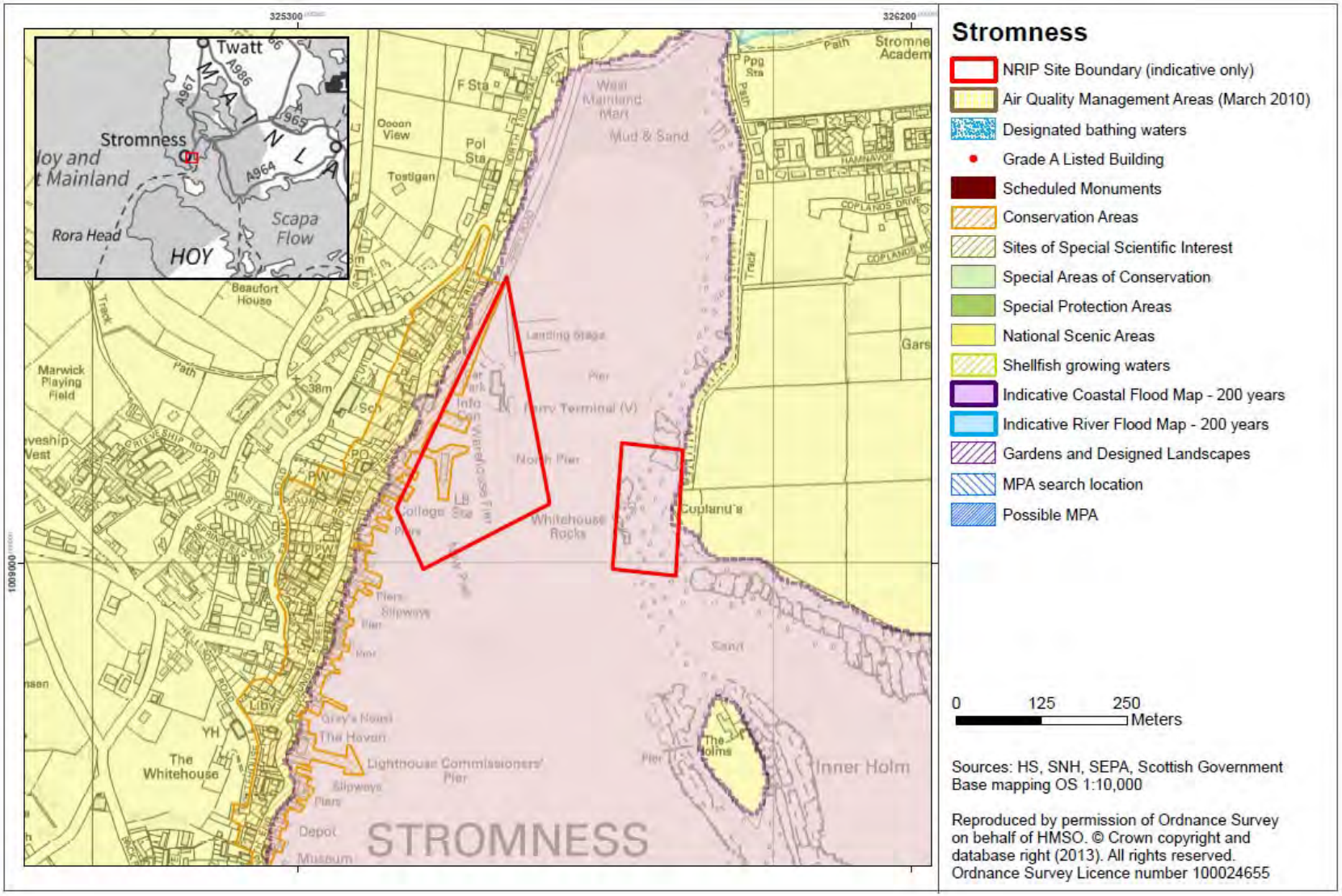
- risk of disturbance to seal haul out locations and corkscrew injury for seals.
- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce landscape/visual effects and effects on historic environment, including wrecks.
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

Early discussions should be held with SNH, SEPA, Historic Scotland, the Local Planning Authority, Harbour Authority, MCA, Inshore Fisheries Group and/or local fishermen, The Crown Estate, Royal Yachting Association Scotland and other vessel operators as required.

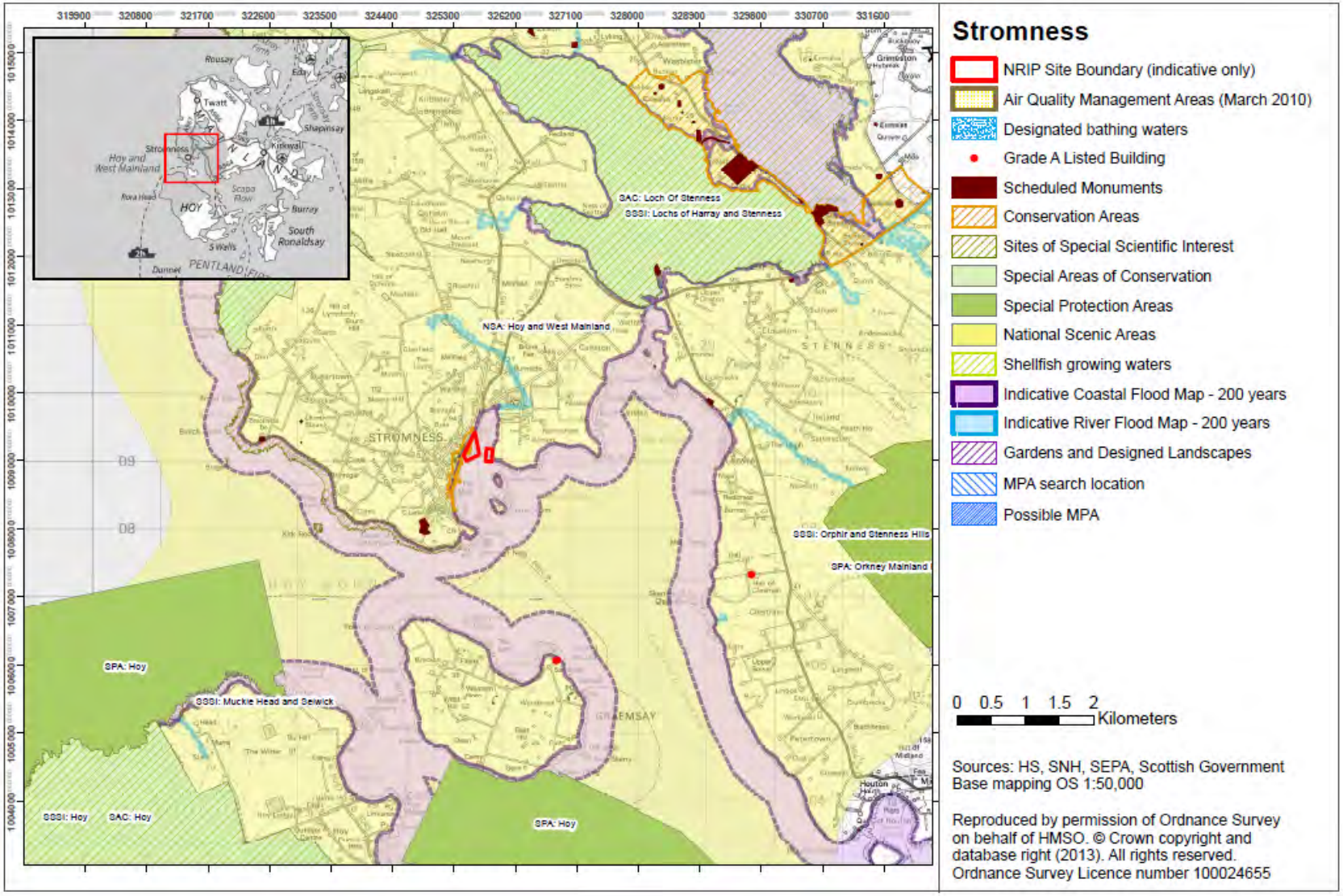
Habitats Regulations Appraisal

It is likely that Habitats Regulations Appraisal will not be required at the project level, as there are no Natura interests in the vicinity of this harbour that are likely to be affected.

Site Map: Stromness (including Copland's Dock)



Site Map: Stromness (including Copland's Dock)



Assessment Table: Stromness (including Copland's Dock)

SITE USE – Assembly/Construction and Installation; Operations and Maintenance

POTENTIAL DEVELOPMENT

Assembly/Construction & Installation

- Within Stromness port and at Copland's Dock, new buildings are likely to be required. (Few existing buildings appear available to re-use.) No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

Operations & Maintenance

- Within the existing port, re-use existing buildings, where possible, or provide new ones. No further infrastructure upgrade required.
- Wet storage of devices may be employed at this location.

See Section 3 of the Environmental Report for assumptions about wet storage.

ENVIRONMENTAL BASELINE – STROMNESS (INCLUDING COPLAND'S DOCK)

Biodiversity, flora and fauna –

Stromness Heaths and Coast SAC - Dry heaths, base-rich fens and vegetated sea cliffs (approximately 2 km north-west and 3 km north-west of harbour).

Lochs of Harray and Stenness SSSI - Aggregations of non-breeding birds – goldeneye, pochard, scaup, tufted duck - Saline lagoon, caddisfly, freshwater nerite snail and eutrophic loch (approximately 4 north-east of harbour).

Loch of Stenness SAC – Inshore sublittoral sediment – Lagoons (approximately 4 km north-east of harbour).

Hoy SPA - Aggregations of breeding birds – red-throated diver, kittiwake, peregrine, puffin, seabird assemblage, great skua, great black-backed gull, guillemot, arctic skua and fulmar (approximately 4 km south-east of harbour).

Seals – Potential designated haul-out site for both grey and harbour seals are located throughout Orkney and the Pentland Firth, the nearest being for harbour seals at Selwick to the south-west and in the Bay of Ireland to the north-east[20]. Indications are that the Orkney waters are well used by both grey and harbour seals[21].

European Protected Species – Cetaceans are likely to be passing through the area. Otters may be found using this area of coast.

[20] The Scottish Government (2011) Consultation on Seal Haul-out Sites, March 2011.

[21] SMRU (2013) Marine Mammal Scientific Support Research Programme MMSS/001/11, Grey and harbour seal usage maps [online] Available at: http://www.scotland.gov.uk/Resource/0043/00437053.pdf [accessed 5/12/2013]

ENVIRONMENTAL BASELINE – STROMNESS (INCLUDING COPLAND'S DOCK)

Waterbirds – An Area of Search developed to identify possible marine SPAs is located in Orkney. While these areas do not as yet represent formal designations, they provide additional information for identifying important aggregations of waterbirds in Orkney and complement the existing network of SPAs[22].

Population and Human Health – Harbour is within a residential area.

Water & Marine Environment – Coastal waters classification (2011): Good.

Climatic Factors – The site is within an Indicative 200 year Flood Zone.

Air – No air quality issues identified.

Soil, Geology & Coastal Processes – **Stromness Heaths and Coast SSSI and SAC** – Coastal Geomorphology of Scotland, non-marine Devonian and maritime cliff (approximately 2 km west of harbour).
Several sections of coastline in West Orkney Mainland have been identified as having the potential for erosion or accretion (e.g. beaches, soft cliffs, etc.), including in the Bay of Ireland. Coastal erosion has been observed at the Bay of Ireland (approximately 3.5 km east of the pier) and along the west coast of Stromness Harbour (approximately 500 m south of the pier).

Cultural heritage – Historic features include Stromness Harbour Warehouse Pier (Canmore ID 153324), New Pier (Canmore ID 153322) and North pier (Canmore ID 153313) at the site, Scheduled Monuments including Ness Battery, coast defence battery (SM8241) approximately 1 km south-west of main harbour area and many Listed Buildings within Stromness, particularly along Victoria and Dundas Streets with the closest being immediately west of the site. Wreck sites have been identified in Stromness Harbour and in Hoy Sound and Clestrain Sound to the south-west and south-east respectively.

Landscape / Seascape – Harbour is within Hoy and West Mainland NSA.

Material Assets –Local fishing and recreational sailing interests use local harbour facilities and aquaculture sites have been identified within Clestain Sounds to the east of Stromness Harbour. Ferry services between Stromness and Scrabster are based at Stromness Harbour[23].

Issues Scoped Out:
Air – There is likely to be increased boat traffic due to O&M activities, which could result in increased atmospheric emissions. However, given existing levels of boat movements, these additional emissions are unlikely to result in significant effects.

[22] The Scottish Government (2011) Special Protection Areas (SPAs) [online] Available at: http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/protectedareas/NATURA/SPAs (accessed 5/4/2014)
[23] The Scottish Government (2011) Scotland's Marine Atlas: Information for the National Marine Plan, pg. 147 – 173.

ASSESSMENT – STROMNESS (INCLUDING COPLAND'S DOCK)				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Biodiversity, Flora and Fauna Birds including red throated diver - Lochs of Harray and Stenness SSSI, Hoy SPA, Areas of search	Potential disturbance (noise and human presence) from site operations; presence of new features likely to disturb and possibly displace red-throated divers from feeding. and wet storage.	Due to the nature of existing activities in the harbour, it is unlikely this will add significantly to existing levels of noise and disturbance; effects will be temporary and localised	Time storage activities and vessel movements to avoid breeding season, overwintering, etc.	Assuming mitigation is implemented, significant adverse environmental effects should be avoided.
Stromness Heaths and Coasts SSSI/SAC and Loch of Stenness SAC	Any new development would be within harbour area so therefore no effects are considered likely.	None.	None required.	None.
Seals	Risk of corkscrew injury from slow-moving vessels with certain types of ducted propeller or those using dynamic positioning; disturbance to seal haul-out locations.	Death of individual seals may affect overall population numbers/ viability, given that the harbour species in particular is generally in decline; displacement of seals.	Avoid using vessels with ducted propellers for slow-speed activities, e.g. manoeuvring, particularly during breeding season. Avoid storage of devices near seal haul out locations during moulting times and breeding season if relevant.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided.
European Protected Species: otters	It is unlikely that proposed activities will add significantly to existing levels of noise and disturbance, due to the nature of existing activities in the harbour. Otter will not be significantly affected (if they are using the harbour area).	No effects	None required.	None.
European Protected Species: cetaceans	Risk of collision with vessels; entanglement in mooring lines (e.g. minke whale); disturbance and displacement	Risk of these events occurring is unclear, thus significance of effect is unknown. Injury and/or death of individuals may affect	Avoid cetacean habitat and migration routes. Use high-visibility mooring lines.	Assuming mitigation is implemented, significant adverse environmental effects may be avoided

ASSESSMENT – STROMNESS (INCLUDING COPLAND'S DOCK)				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
		overall population numbers/viability		
Population / Human Health Residential developments within 100 m of site.	Noise disturbance during site operations. Due to the nature of existing activities in the harbour, it is unlikely this will add significantly to existing noise/disturbance levels.	Localised	Site protocols and/or good neighbour agreements would set out conditions for controlling noise and/or disturbance from construction activities and site operations.	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
Water & Marine Environment Coastal waters classification	Increased turbidity from the anchorage or storage of gravity devices directly on the seabed. Introduction of devices into the waterbody.	Effects are likely to be localised and temporary	Increased turbidity: as above. No mitigation proposed for temporary morphological effects.	Increased turbidity: as above. Temporary morphological effects.
Climatic Factors Site is within the Indicative 200 year Flood Zone.	Potential for Stromness Pier and surrounds to be at risk of flooding from the sea.	This will be a permanent threat given the long-term impacts of climate change.	Ensuring suitable design measures to increase defensibility and mitigate adverse effects of potential sea level rises	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.
	Increase in GHG emissions due to vessel movements associated proposed activities.	Emissions from vessels are unlikely to contribute significantly to those from the existing Scottish fleet.	Vessel operators may wish to implement energy- and fuel-efficiency measures to reduce fuel consumption and consequent GHG emissions.	Emissions from vessels would continue but are unlikely to contribute significantly to those from the existing Scottish fleet.
Soil, Geology & Coastal Processes Stromness Heaths and Coast SSSI - Coastal Geomorphology of Scotland, non-marine Devonian and maritime cliff. Coastal processes.	Potential damage to coastal geological features from wet storage of devices. (Devices have the potential to result in some changes to wave energy dissipation and coastal processes.)	Effects of this will range from temporary to permanent depending on storage location/duration and frequency.	Locate devices away from such features. Alternatively, implement sediment and erosion controls during wet storage operations. If alternative locations are used, ensure that these do not affect areas vulnerable to erosion (e.g. southern portion of Stromness Harbour, Bay of Ireland).	Assuming mitigation is implemented, significant adverse environmental effects could be avoided.

ASSESSMENT – STROMNESS (INCLUDING COPLAND'S DOCK)				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
Cultural Heritage Listed Buildings and Scheduled Monument located at the site and in its environs, including the Warehouse, New and North Piers.	Site operations will use existing infrastructure and buildings. No effects on the site and setting of listed buildings are therefore likely.	No effects	None required	None
Wreck sites	Storage of devices could affect wreck sites through destruction of features.	Permanent loss of wreck features	Avoid storage on these areas.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Landscape / Seascape Site is within Hoy and West Mainland NSA Local residents	Storage of devices which are on or break the water surface may have adverse local landscape and visual effects.	Effects are likely to be local in nature and temporary.	At the local level, it may be desirable to locate devices in a sheltered bay away from overall views from Stromness.	Assuming mitigation is implemented, the potential for significant adverse effects at the local level should be reduced.
Material Assets Harbour access	Possible effects on navigational safety, e.g. ferry movements. Devices could block access to the harbour/ferry terminal and displace harbour users (e.g. require ferries to be re-routed).	Collisions could result in injury/death of human beings, oil spills etc. Inefficient operation of ferry terminal and/or ferries. Potential displacement of harbour activities.	Ensure that devices are located away from access points to the harbour. Wet storage site will need to be appropriately lit and/or marked. Liaison with MCA, Harbour Authority and other vessel operators to agree storage areas and navigable channels.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Fishing grounds	Possible disturbance and/or displacement of local fishing grounds by wet storage of devices.	Temporary loss of fishing grounds during storage operations. Potential displacement of fishing activities – adverse socio-economic and community effects; potential intensification of fishing	Ensure that devices are located away from these areas. Liaison with Inshore Fisheries Group and/or local fishermen as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.

ASSESSMENT – STROMNESS (INCLUDING COPLAND'S DOCK)				
Environmental Receptor	**Effect**	**Characteristic**	**Mitigation**	**Residual Effects**
		elsewhere.		
Recreational areas	Possible disturbance and/or displacement of recreational areas by wet storage of devices.	Temporary loss of recreational areas during storage operations, with concomitant local economic loss.	Ensure that devices are located away from these areas. Liaison with Royal Yachting Association Scotland as required.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
Shellfish and finfish interests	Possible damage to existing aquaculture infrastructure, e.g. in the event of devices breaking loose.	Permanent loss of equipment/facilities	Storage sites will need to be located away from aquaculture sites. Liaison with The Crown Estate and aquaculture operators to agree a suitable distance.	Assuming mitigation is implemented, the risk of significant adverse effects should be reduced.
OTHER DEVELOPMENTS Ferry services and other marine users (e.g. fishing and recreational vessels, those servicing aquaculture sites, etc.) utilise harbour facilities at Stromness.				
Cumulative Effects	Possible cumulative effects with existing vessel traffic and anchorages in and around the harbour identified. Assuming mitigation is implemented, the risk of significant adverse cumulative effects should be reduced.			

Implications for development:
The following requires further examination at the project level:

- effects on birds using harbour from nearby SPA, MPA and SSSI habitats.
- risk of disturbance to seal haul out locations and corkscrew seal injuries.
- preparation and agreement of construction protocols/good neighbour agreements.
- need to alleviate flood risk through project planning and design.
- planning and design to avoid and/or reduce landscape/visual effects and effects on historic environment, including wrecks.
- if wreck sites cannot be avoided, undertake survey and recording of wrecks prior to wet storage

Early discussions should be held with SNH, SEPA, Historic Scotland, the Local Planning Authority, Harbour Authority, MCA, Inshore Fisheries Group and/or local fishermen, The Crown Estate, aquaculture operators, Royal Yachting Association Scotland and other vessel operators as required.

Habitats Regulations Appraisal

It is likely that Habitats Regulations Appraisal will be required at the project level, covering at least the following issues:

- effects of site operations on birds from nearby SPA, MPA and SSSI habitats

Early discussions should be held with SNH.