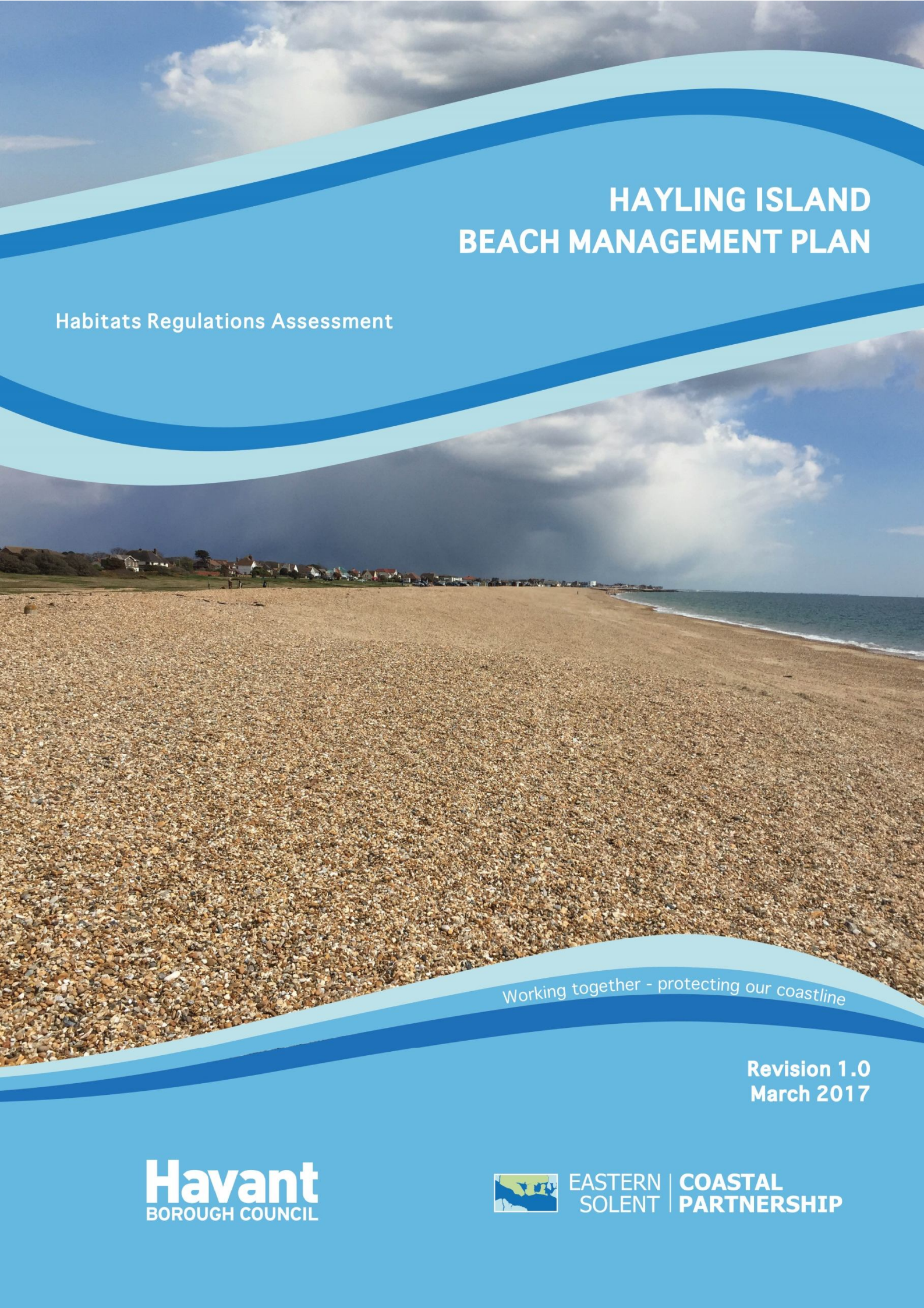




HAYLING ISLAND BEACH MANAGEMENT PLAN

Habitats Regulations Assessment

Working together - protecting our coastline

Revision 1.0
March 2017

Havant
BOROUGH COUNCIL



**EASTERN
SOLENT | COASTAL
PARTNERSHIP**

Page Intentionally Blank

Working together - protecting our coastline



EXECUTIVE SUMMARY

This HRA has been prepared to demonstrate that the newly developed South Hayling Island Beach Management Plan (BMP) 2017-22 can be delivered without causing a Likely Significant Effect [LSE] on the European environmental designated sites and their interest features. Planning permission and a marine licence are being sought into perpetuity to continuously deliver beach management activities along the South Hayling Island open coastline in line with the BMP. Whilst the BMP is labelled '2017-22', this only relates to funding, not permissions given that beach management is the long term preferred Flood and Coastal Erosion Risk Management (FCERM) option for this coastal frontage.

It provides an overview of the Habitat Regulations, a summary of the proposed BMP activities and information on the European sites and their interest features that could be impacted by the scheme to support the Environmental Statement that has been prepared for the full scheme.

Using background environmental information, an impact assessment has been completed to demonstrate whether the overall scheme could impact the European sites and their interest features. Where a potential impact could occur, mitigation measures have been identified to reduce, or remove the impact, thereby allowing a conclusion of whether or not there is any resultant LSE. This impact assessment considers the overall scheme impacts and potential 'In-Combination' impacts in order to conclude whether there will be an overall LSE from construction of the scheme within the wider environment.

This HRA supports an Environmental Statement that has also been prepared for the BMP, which should be read alongside this.

Page Intentionally Blank

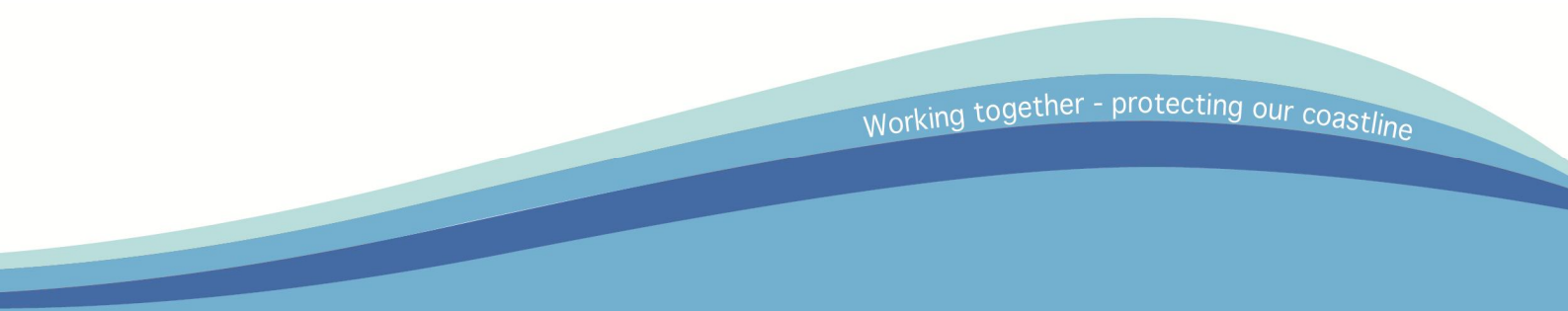
Working together - protecting our coastline

ACRONYMS

AA	Appropriate Assessment
AEP	Annual Exceedance Probability
BMP	Beach Management Plan
CEMP	Construction and Environmental Management Plan
CIA	Cumulative Impact Assessment
DAS	Discretionary Advice Service
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESCP	Eastern Solent Coastal Partnership
FCERM	Flood and Coastal Erosion Risk Management
HBC	Havant Borough Council
HISC	Hayling Island Sailing Club
HRA	Habitat Regulations Assessment
HTL	Hold the Line
IROPI	Imperative Reasons of Overriding Public Interest
LPA	Local Planning Authority
LSE	Likely Significant Effect
MHWS	Mean High Water Springs
MMO	Marine Management Organisation

Working together - protecting our coastline

NE	Natural England
pSPA	Proposed Special Protection Area
SAC	Special Areas of Conservation
SAM	Scheduled Ancient Monument
SCI	Sites of Community Importance
SEA	Strategic Environmental Assessment
SMP	Shoreline Management Plan
SOP	Standard of Protection
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
WFD	Water Framework Directive



Working together - protecting our coastline

CONTENTS

Section	Title	Page
1	INTRODUCTION	1
1.1	South Hayling Island Open Coast Beach Management Plan (2017 – 22)	1
1.2	Habitat Regulations Assessment	2
2	OVERVIEW OF THE HABITAT REGULATIONS ASSESSMENT PROCESSES AND METHODOLOGY FOR ASSESSMENT	7
2.1	Overview of the Habitat Regulations	7
2.2	The Habitat Regulations Assessment Process	8
2.3	Hayling Island BMP 2017-22 HRA Process	8
3	BACKGROUND TO THE PROPOSED BEACH MANAGEMENT ACTIVITIES	11
3.1	Introduction	11
3.2	Strategic background	12
3.3	Beach Management Activities	13
3.3.1	Sources of shingle and methods of extraction / placement	13
3.3.2	Coastal Process Modelling	15
3.3.3	Environmental Monitoring	17
3.3.3.1	Habitat Surveys	17
3.3.3.2	Bird Surveys	18
4	BACKGROUND INFORMATION REGARDING RELEVANT EUROPEAN SITES	21
4.1	European Sites	21
4.2	Chichester and Langstone Harbours - SPA and Ramsar	21
4.2.1	Chichester and Langstone Harbours SPA	21
4.2.2	Chichester and Langstone Harbours Ramsar	25
4.3	Solent Maritime SAC	26
4.4	Solent and Dorset Coast Proposed SPA [p SPA]	28
5	ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS	31

5.1	Summary	31
5.2	Summary of impact assessment process	31
5.3	Impacts, mitigation and LSE of the proposed Hayling Island Beach Management Activities	31
5.3.1	Impacts	31
5.4	In-Combination / Cumulative Impacts Assessment	40
5.4.1	Introduction	40
5.4.2	Projects Identified	40
5.4.3	Cumulative Impacts Assessment Investigations	41
5.4.4	Assessment of 'In-combination' Impacts	41
6	CONCLUSIONS	45
6.1	Is the proposal likely to have a significant effect 'alone and / or in-combination' on a European Site	45

List of Figures

1.1	Location of the proposed Beach Management Activities divided into Beach Management Plan Units 1 to 8	4
1.2	Map of the existing and extended BMP area	5
3.1	Difference plot showing beach change between 2005 and 2015, the analysis can also help to identify pulses of shingle moving along the beach	17
3.2	High level summary of the location of vegetated shingle and drift line habitats	20
4.1	International and European protected sites adjacent to Hayling Island	29

List of Tables

4.1	Chichester and Langstone Harbours SPA site qualification information	22
4.2	Chichester and Langstone Harbours Ramsar site qualification information	25
4.3	Annex I habitats that are a primary reason for the selection of this site as an SAC	27
4.4	Annex I habitats and Annex II species present that are not a primary reason for the selection of this site as an SAC	27
5.1	Potential impacts, mitigation and likely significant effects of the proposed South Hayling Island Beach Management Plan to advise the Habitat Regulations Assessment	33
5.2	Plans and Projects considered in the CIA	40
5.3	How the scheme impacts identified in Table 5.1 could be influenced by 'in-combination' effects of other proposals within or adjacent to the European sites	41

Appendices

Appendix A – Ecological Watching Brief.....	46
---	----

1. INTRODUCTION

1.1 South Hayling Island Open Coast Beach Management Plan (2017-22)

The South Hayling Island Open Coast Beach Management Plan (BMP) 2017-22, for which this Habitat Regulations Assessment (HRA) has been prepared, covers the entire sediment cell of the south Hayling Island open coast, from Black Point (SZ 74892 99123) within Chichester Harbour, to the Langstone Harbour Board Jetty (SU68837 0054) within Langstone Harbour. It covers 9km of the southern Hayling Island open coastline, Hampshire on the south coast of England, as illustrated on **Figure 1.1**. The BMP aims to maintain critical beach levels through recycling and recharging beach material to maintain the appropriate standard of flood and erosion protection. Historic beach management activities have taken place along parts of this coastline since an initial major beach recharge in 1985; however the newly updated BMP (2017-22) has extended the area of routine beach management activities to include the full sediment cell. These beach management activities are guided by the nationally adopted BMP technical report, which is included as **Appendix A of the Environmental Statement**.

The area with the highest coastal flood and erosion risk along this coastline is the residential area of Eastoke (the area between Eastoke Corner and Eastoke Point), as illustrated by **Figure 1.1**. The need for beach management activities to 'Hold The Line' of the shingle defence has been agreed at a strategic level in the Eastoke Sectoral Strategy (2006) and the North Solent Management Plan (2010). In 2013 the Eastoke Point Coastal Defence Scheme was also completed to install hard defences (rock revetments and groynes) along the most vulnerable stretch of coastline at Eastoke. This was designed to operate with ongoing Beach Management activities to provide the required standard of flood and coastal erosion protection to the community at Eastoke. The area of Eastoke has flooded on a number of occasions in

the past and so the beach management activities will ensure that 1550 properties are given the appropriate 1:200 standard of protection.

Hayling Island is an urban area and is home to a mixture of residential and commercial properties. The Eastoke Strategy identified that there were a number of assets at risk from both flooding and erosion based on a 0.5% AEP flood event in year 100, should the shingle beach fail. These assets include:

- 1550 residential properties
- Sparks Marina
- Sandy Point Local Nature Reserve
- Hayling Island Sailing Club
- Extensive holiday chalets and caravan parks

The strategy also reiterated that beach management needs to continue in order to keep this standard of protection and to maintain the shingle beach at the specified levels.

The process of recycling shingle and nourishing the beach at intermittent times has been an ongoing activity for a number of years at Hayling Island. Initial major beach nourishment took place in 1985. The beach management concept and approach is an accepted one. The historic strategic background has been highlighted in the **Environmental Statement (Section 2.1)**. This BMP has been designed to ensure there is no likely significant effect on the interest features of the designated sites, with more information included in the Environmental Statement on the consideration of alternatives, etc.

Figure 1.2 illustrates the South Hayling Island open coastline, where beach management activities have been undertaken historically through adopted BMPs. This area actually has ongoing planning permission for beach management activities until late 2019; however this will be superseded by this new application. **Figure 1.2** also highlights the proposed extended BMP area (future extent), which has invoked the need for this new planning / marine licence application; because the area has been extended, and new mitigation measures have been proposed. We are seeking permission for beach management activities in line with the BMP into perpetuity.

1.2 Habitat Regulations Assessment

This report provides the information required to enable the competent authorities to determine the implications of the proposed beach management activities on the designated European nature conservation interests. It is guided by the Environmental Scoping Report and our Regulator's opinions on this.

On the 16th September 2016, the ESCP received a Scoping Opinion, under The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) and the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. This was provided by the Marine Management Organisation (MMO), included as **Appendix B of the Environmental Statement**. The Scoping Opinion was based on the initial scope of the works, which has subsequently been refined in more detail. Since this time a number of site visits and meetings have been held with various consultees to refine the detail of the works to take into account any concerns, ideas to improve the scheme and the development of a monitoring and mitigation plan.

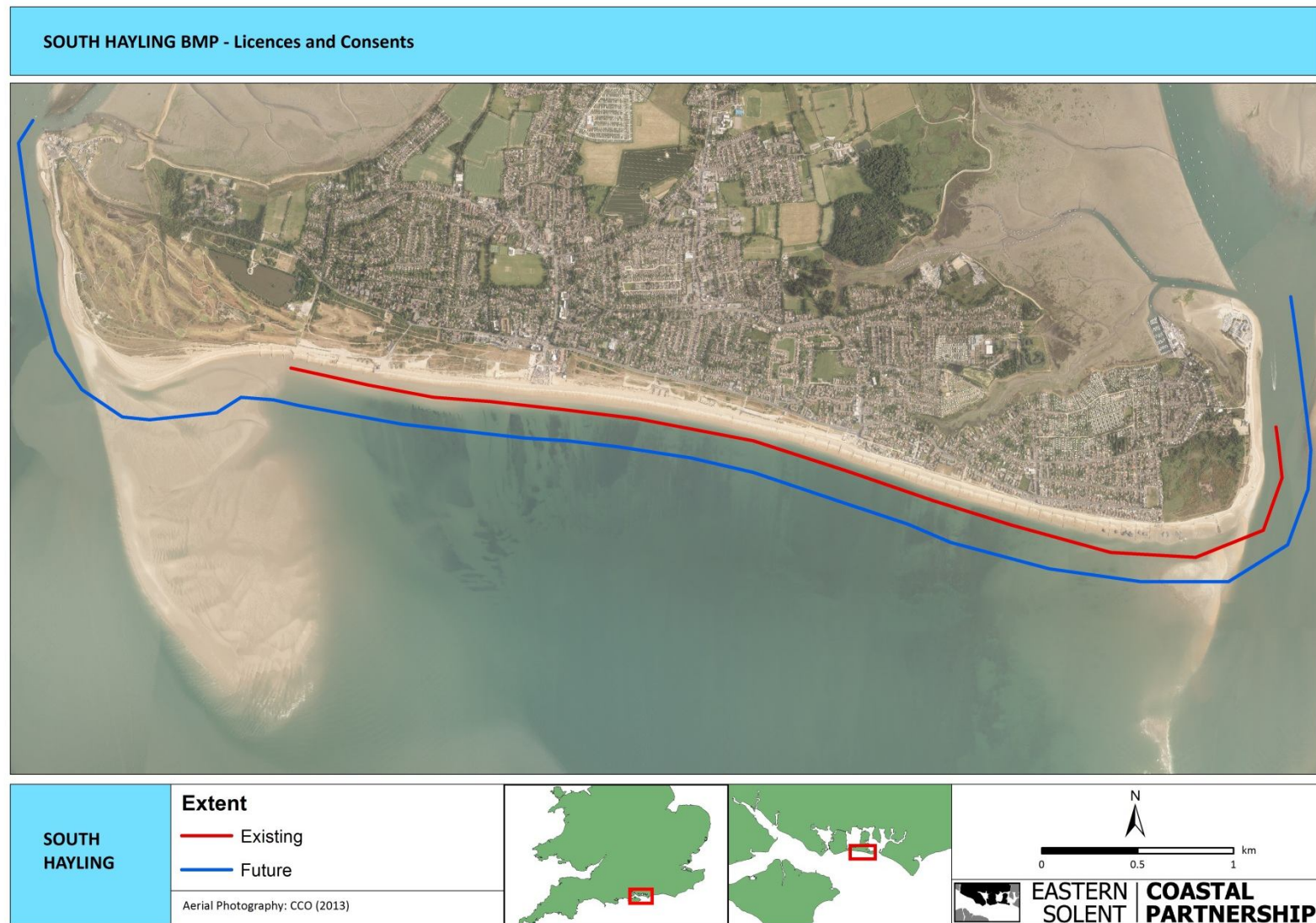
This HRA is structured so as to present a view as to whether the proposed Beach Management Activities would (either alone or in-combination with other plans or projects) be likely to have a LSE on the designated European nature conservation interests and the objectives that apply to these interests. The assessment process is explained below but, in summary, the following is provided:

- an overview of the HRA process and methodology for assessment;
- Information on the proposed Beach Management Activities;
- Background information regarding relevant European sites;
- Assessment of Impacts and Likely Significant Effects; and
- In-combination Impacts, Summary and Conclusion.

Figure 1.1: Location of the proposed Beach Management Activities divided into Beach Management Plan Units 1 to 8



Figure 1.2: Map of the existing and extended BMP area



Page Intentionally Blank

2. OVERVIEW OF THE HABITAT REGULATIONS ASSESSMENT PROCESSES AND METHODOLOGY FOR ASSESSMENT

2.1 Overview of the Habitat Regulations

The 'Habitats Directive' (Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora) protects habitats and species of European nature conservation importance. Together with Council Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive establishes a network of internationally important sites designated for their ecological status. Special Areas of Conservation [SACs] and Sites of Community Importance [SCIs] are designated under the Habitats Directive and promote the protection of flora, fauna and habitats. Special Protection Areas [SPAs] are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. These sites combine to create a Europe-wide 'Natura 2000' network of designated sites; hereafter referred to as 'European sites'.

In the United Kingdom, the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations') incorporate all SPAs into the definition of European sites and, consequently, the protections afforded to European sites under the Habitats Directive apply to SPAs designated under the Birds Directive.

In addition to sites designated under European nature conservation legislation, United Kingdom Government policy (ODPM Circular 06/2005) states that internationally important wetlands designated under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

Regulation 61 of the Habitats Regulations defines the procedure for the assessment of the implications of plans or projects on European sites. Under this Regulation, if a proposed development is unconnected with site management and is likely to significantly affect the designated site, the competent authority must undertake an 'appropriate assessment' (Regulation 61(1)).

2.2 The Habitat Regulations Assessment Process

The Hayling Island Beach Management Plan has been assessed through the standard HRA process. This standard process is summarised below, with **Section 2.3** setting out how we have applied this to the proposed full South Hayling Island open coast BMP:

Step 1, Screening: The process to identify the likely impacts of a project upon a European site, either alone or in combination with other plans and projects, and consider whether the impacts are likely to be significant.

Step 2, Habitat Regulations Assessment: The consideration of the impacts on the integrity of the European site, either alone or in combination with other plans and projects, with regard to the site's structure and function and its conservation objectives. Where there are adverse impacts, an assessment of mitigation options is carried out to determine adverse effect on the integrity of the site. If these mitigation options cannot avoid adverse effects then development consent can only be given if stages 3 and 4 are followed.

Step 3, Appropriate Assessment / Assessment of Alternative Solutions: Examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid or have a lesser effect on European sites, and identification of compensation opportunities if these are required.

Step 4, Imperative Reasons of Overriding Public Interest [IROPI] (Step 4): This is the assessment where no alternative solution exists and where adverse impacts remain. It is the process to assess whether the development is necessary for IROPI and, if so, the potential compensatory measures needed to maintain the overall coherence of the site or integrity of the European site network. This is not considered to be a standard part of the process and will only be carried out in exceptional circumstances.

2.3 Hayling Island BMP 2017-22 HRA Process

Step 1 has been completed, as the South Hayling Island BMP 2017-22 Scoping Report was submitted to the MMO in 2014. At this time Havant Borough Council Planning Team did not have the resources to carry out a scoping exercise. The Scoping Report was circulated to statutory consultees and wider environmental stakeholders, to confirm the expected implications of the continuation of the BMP activities and if the extension of the geographical area had any additional impacts that could be considered to have Likely Significant Effects, with information to advise

the HRA. The Scoping Opinion was received in 2016, and this advised detailed design of the BMP and ongoing approvals.

This HRA delivers **Step 2**, feeding from the environmental scoping report, the scoping opinions received and the latest detail of how to manage the activities. It reconsiders the potential impacts on the integrity of the European sites, alone, and in combination with other plans and projects. It has been developed alongside discussion with Natural England, where we used the Discretionary Advice Service (DAS) to ensure the BMP could be delivered without having any Likely Significant Effect on the protected environment, following the adoption of any necessary mitigation.

In order to deliver the SMP and the Eastoke Sectoral Strategy, policy of 'Hold the Line' along the South Hayling Island frontage, considerable effort was invested into originally selecting the preferred scheme design options. Rock revetment and groynes, with recharge and recycling were chosen in 2009. Since this time (and previously in 1985) beach management has continued, with rock revetments and groynes constructed at Eastoke in 2014. The ESCP is now looking at extending the areas of the BMP works to cover the whole sediment cell and are also looking to extend the Planning Permission as the current works are time limited (this is illustrated by **Figure 1.2**). The concept of Beach Management has been accepted. The focus of this assessment is on where to source the shingle from to ensure it is sustainable and also will not have a likely significant effect on the interest features of the designated sites.

There is no proposal to consider alternative FCERM options to the BMP itself, as we are already promoting the most economically, technically and environmentally preferred option following a rigid option selection process at the strategic level. Therefore there are no affordable alternative solutions to the proposed BMP that will provide the required standard of FCERM protection with a lesser impact on the environment. For this reason a **Step 3** Appropriate Assessment is not expected to be required, as an assessment of options has already been appropriately undertaken prior to the promotion of this BMP. This also removes the need for a **Step 4** IROPI case.

To select a suitable source, or combination of sources of shingle to undertake BMP activities, the ESCP have carried out a large amount of research over many years to determine where the sediment is moving and in what quantities. This monitoring is ongoing and helps advise the BMP operations.

Page Intentionally Blank

3. BACKGROUND TO THE PROPOSED BEACH MANAGEMENT ACTIVITIES

3.1 Introduction

This HRA relates to the continuation and an increase in the extent of beach management on the South Hayling Island open coastline (as illustrated by **Figure 1.2**). The shingle beach is the primary coastal defence in this location so the ESCP manage the beach systematically to maintain both the height and the profile of the beach to reduce the risk of flooding to the area of Eastoke. The Shingle beach protects 1550 properties.

The beach has been managed through beach management since 1985, where the first nourishment took place. The shingle dissipates wave energy, however due to the natural process of longshore drift there has been a requirement for ongoing shingle recycling to maintain the level of protection provided by the beach. In 2006, an Eastoke Strategy was developed followed by the Shoreline Management Plan which recommended a 'hold the line' policy in this area.

The decision to increase the extent of the area of beach management is to consider the whole sediment cell, to be able to utilise areas where accretion has taken place over the last few years, resulting in a more sustainable scheme (see **Figure 1.2**).

Although the works cover a large area (9.km with the extended BMP area), the programme of works is of short duration on an annual basis. Works generally take place in March for a 2-3 week period, and occasionally works can also take place in September. The works in March return the beaches to their critical levels following winter storms, and the September works ready the beaches in advance of the winter storms. More frequently going forward, we are expecting to undertake ad hoc winter operations (between September and March) in response to winter storms that can significantly lower the standard of defence. All these works will be able to take place providing the proposed monitoring and mitigation are followed, as set out within **Section 5** of this HRA.

3.2 Strategic background

The Eastoke Sectoral Strategy Study (2006) set out the preferred option for defending the Eastoke Peninsula. Beach management was the preferred and nationally adopted FCERM option. This option is also consistent with the 'Hold the Line' (HTL) policy within the North Solent SMP (2010). An initial BMP was developed and then Implemented from 2012- 2017. This new BMP (2017 - 2022) has recently been finalised and the technical BMP report (**included as Appendix A of the Environmental Statement**) provides the detailed background to the scheme, which the assessments within this HRA are based on.

The North Solent SMP (2010) undertook a Strategic Environmental Assessment (SEA), which concluded that the impacts of the policy of 'Hold the Line' would be as follows:

Biodiversity, Flora and Fauna	Resultant Impact
Sand Dunes	
Sand dunes (SSSI) at Sinah Common are currently defended therefore HTL will have a negligible impact.	Negligible
Vegetated Shingle	
Short term - HTL in the short term will have a negligible impact on vegetated shingle (SSSI) at Sinah Common if beach nourishment/ac creation is in line with sea level rise	Negligible
Long term – HTL in the long term will result in some loss of vegetated shingle as it will be difficult to maintain the coastline in current position through renourishment. This will have a minor adverse impact.	Minor Adverse
Landscape	
Short term - HTL in the short-term will have a negligible impact on the existing landscape as there is no 'change' to the landscape character.	Negligible
Long term - increasing the level of defences in the long-term may have a minor adverse impact on the existing harbour views and designated landscape.	Minor Adverse
All other aspect were considered to have a beneficial impacts	
Cultural Heritage	
HTL policy will provide protection to designated heritage features including Anti- Aircraft gun site SAM & Coast Guard conservation from coastal from flooding and erosion. This will have a significant beneficial over all epochs	Significant Beneficial
Material Assets	
HTL policy will provide protection to roads along the seafront, commercial and residential properties from coastal flooding and erosion. This will have a significant beneficial impact on the built environment over all 3 epochs.	Significant Beneficial
Population and Human Health	
HTL will provide protection to locally designated SINC's, open amenity areas and public footpaths from coastal flooding. This will have a significant beneficial on recreation.	Significant Beneficial
HTL will provide protection to people and their property from coastal flooding and therefore have a significant beneficial impact on human health and population	Significant Beneficial

These impacts are discussed further in **Section 5** of this HRA, where mitigation (if required) has been promoted to ensure no Likely Significant Effect on the highly designated natural environment in the area of this BMP.

3.3 Beach management Activities

This section summarises how the different sources of shingle will be chosen in any one year to maintain the critical beach levels set out within the BMP technical report. This information will be used to confirm whether there could be any Likely Significant Effects on the European Sites within this HRA. It will go on to set out the proposed monitoring of activities.

3.3.1 Sources of shingle and methods of extraction / placement

The BMP Technical Report (**Appendix A of the Environmental Statement**) sets out more details on the methods of recycling and nourishment, and a summary is provided within **Section 4 of the Environmental Statement**. As a summary, the potential sources of shingle are as follows (see **Figure 1.1** for location details of units):

- **Recycling open beach materials:** There are two major sources of beach material for recycling along the open coast:
 - o The main open beach (BMP units 4 and 5);
 - o Gunner Point (BMP units 6 and 7);

With recycling, the concept is to take material from areas of accretion to areas of erosion, generally around Eastoke (BMP units 2 and 3). Our historic BMP activities have only enabled recycling between BMP units 2 to 5 inclusive, and so with the new application we are seeking to extend our areas for recycling to include BMP units 6 and 7 to maximize our opportunities for recycling across the full Hayling Island sediment cell. Gunner Point (BMP Units 6 and 7), has been accreting over many years, both prior to and significantly since historic BMP nourishment works along the wider Hayling Island coastline.

- **Recycling: beneficial use of dredge material:** The approach channel to Chichester Harbour fills up with sediment from the beach over time, creating a navigational hazard. This assessment will not consider the implications of the dredge itself, as this is undertaken by the Chichester Harbour Master under the powers of the Chichester Harbour Conservancy Act 1971. It is a duty under the Port Marine Safety Code for safe navigation. The dredging has been assessed within the dredging Protocol for Chichester Harbour, which has agreement from Natural England and the MMO.

Only the deposition of the sediment as a beneficial use of the dredged material will be considered within this report. This dredging would still take place without the BMP however the sediment has originated from the Hayling Island open coastline and is therefore of appropriate grading and quality for use within the plan and represents a beneficial use of dredged material using a technique called rainbowing. Rainbowing is an activity by which shingle is pumped ashore via barge. It is only the beneficial use and the mode of deployment (rainbowing) that this application is applying for and not the dredge itself. Without pumping this material ashore, it would be disposed of offshore of the Isle of Wight, which would have a negative effect in terms of shingle material being lost from the Hayling Island sediment cell, and the need to transport this material longer distances.

- **Nourish the beach from offshore sources of shingle:**
 - o There are two means of moving the material onto the beach, it can be rainbowed ashore directly from the dredging hopper
 - o The material can be brought in to a local aggregates wharf and then transported to the site via road.
- **Localised reprofiling of the beach around BMP unit 8 at Langstone Harbour entrance:** Here, minor reprofiling works may be undertaken to prevent localised erosion issues. There will be no transfer of materials away from this BMP unit, but areas of accretion within the unit will be used to fill areas of erosion within the unit.
- **Localised recycling of sand around Hayling Island Sailing Club:** The area covered by BMP U1 has experienced high accretion of primarily sand in the last few years. It is proposed that this material will be transported to Eastoke to the east of the drift divide, where the material will then gradually move back around to Black Point Spit. This would have the benefit of helping the Hayling Island Sailing Club (HISC) to be able to use their infrastructure which has become less and less intertidal over the last few years as the levels of sand have built up. These would be minor works to support a local and historic business, which would fund the actual operation.

Summary of recycling and recharge techniques

To deliver the BMP, it is likely that a combination of all the above sources will be utilised. Material will only be taken from an area if there is sufficient accretion to allow it to be transported back to Eastoke to maintain the standard of protection to

protect the 1550 properties through maintenance of critical beach levels. If there has not been sufficient accretion, another source will be considered or combination of sources (i.e. more material brought in via offshore sources).

Selection of the final preferred sources of shingle and mechanisms for transporting the shingle to Eastoke were based heavily on the environmental impacts of each, taking advice from our statutory and wider stakeholders and technical experts. In the more sensitive environmental locations (BMP Units 1, and 6 – 8), we will continue to liaise with Natural England as we plan annual operations to ensure they are satisfied with our proposals, as set out in the impact assessment / mitigation table included within **Section 5** of this HRA.

Whilst the final preferred options will result in some unavoidable environmental impacts, mitigation and best practice working has been identified to reduce these impacts, as set out within this HRA to ensure no Likely Significant Effect on the protected environment.

We have established viable options for each of the sources of shingle and mechanisms for transporting it that are considered to have the least impact on the environment and the European Sites. Therefore this HRA will confirm any resultant adverse environmental impacts and the mitigation to reduce / remove these impacts. It is believed that the sources of shingle and the mechanism for moving them, will have the least significant effect on the environment, and as set out in this HRA, will avoid adverse effects on the European sites.

Alternative options for protecting this section of coastline were considered at the Sectoral strategy level and are considered to be either ineffective or would have such large environmental impacts that these options would have been considered unacceptable (i.e. construction of major seawalls).

This report will therefore identify any potential environmental impacts from delivery of the Beach Management Activities and to establish any avoidance/mitigation that will be required during the plan's lifetime to reduce these impacts to an acceptable level.

3.3.2 Coastal Processes Monitoring

Monitoring will take place in order to identify where the most appropriate sources of shingle are in any one year. This monitoring will also help our understanding of the effects of BMP activities, allowing us to proactively refine future campaigns.

The monitoring includes:

Surveys	Description
Beach baseline topographic survey	A full topographic survey of the beach surface is carried out annually
Beach Profile Surveys	Topographic beach profile surveys carried out in Spring
	Pre and Post storm profiles will be collected if possible
	Pre and post campaign surveys
Beach Recycling Logs and Survey	During Beach Management Activities and beach re-profiling - the location and volume of material recycled or recharged is recorded
Bathymetric Survey	Annually/ bi annually minimum of 200m beyond mean low water neaps
Visual beach inspections	Inspecting beach level and defects to any structures
Aerial Photography and LIDAR	Every five years. Continuation of this aerial photography and LiDAR surveys, combined with regular monitoring of beach levels, will allow future derivation of long term trends and recession rates across the BMP area.
Beach Sediment Tracer Surveys	Used to inform the ongoing sediment budget analysis that is the basis for establishing recharge and recycling requirements for the nourished frontage.
Sediment Sampling	Sediment Size grading is undertaken across the beach (high water to low water) and compared to earlier years. Due to the coarseness, origin, and large sizes of sediment, it is considered unlikely that contaminants can bind to the beach material that is recycled. The beach material is also regularly washed over by the tide. For this reason, the beach recycling works are not expected to result in any contamination issues, and never have historically.

An analysis of topographic data has produced difference plots between 2006 and 2016 using summer baseline surveys, showing annual change in beach levels. A decrease in beach elevation is shown in red and an increase in beach elevation is shown in blue. The extent of the difference plots is depicted with a yellow boundary. A difference plot for the South Hayling Island coastline is included as **Figure 3.1**, which illustrates the changes in beach elevation between 2005 and 2015, bearing in mind that on-going BMP activities have been undertaken. Note the significant accretion of material at Gunner Point where material has historically drifted west, through the process of Long Shore Drift from frequent beach recharges at Eastoke / BMP U2 to U3. Such data helps us plan where we should be recycling from, and areas that are suffering erosion, requiring action.

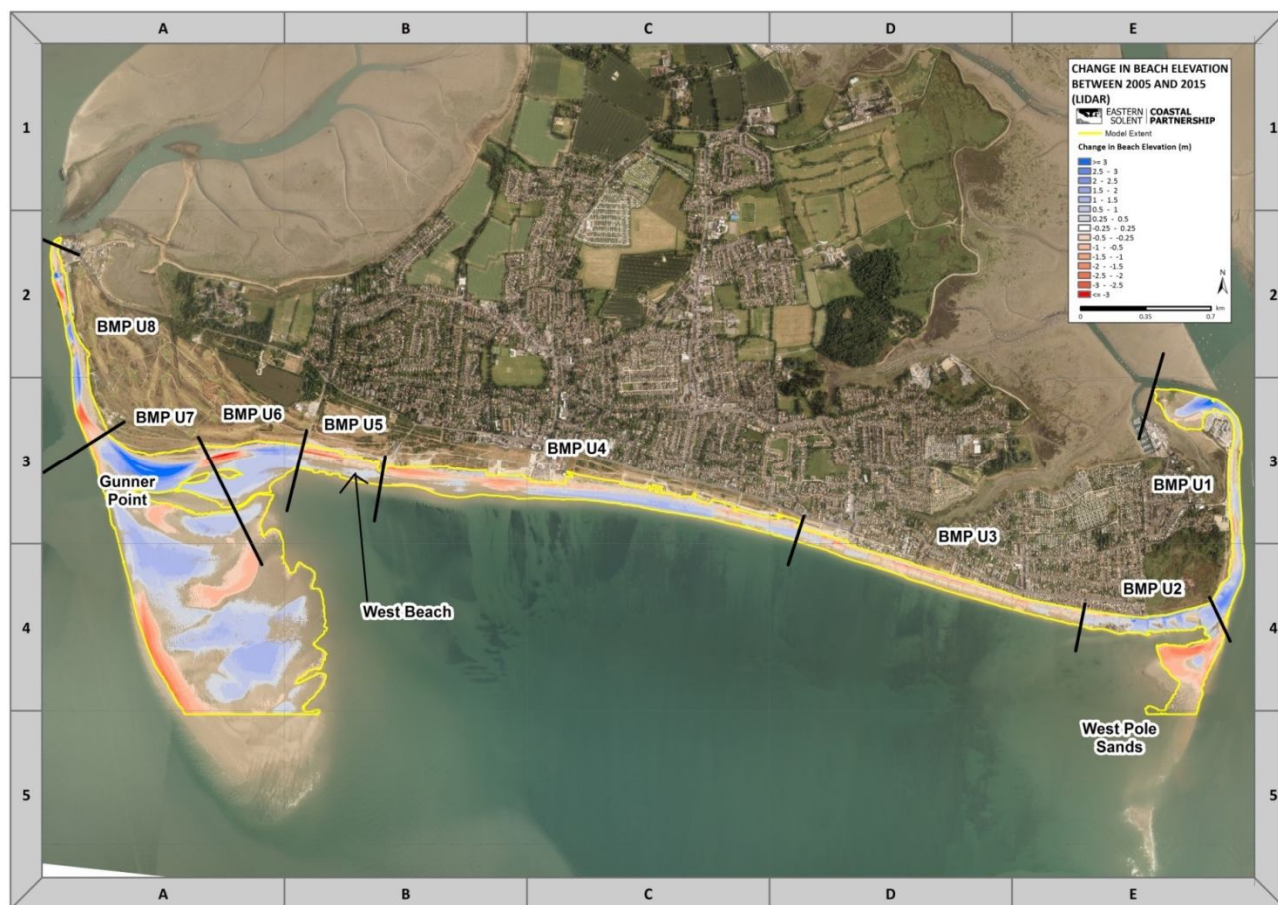


Figure 3.1: Difference plot showing beach change between 2005 and 2015, the analysis can also help to identify pulses of shingle moving along the beach

3.3.3 Environmental Monitoring

Other monitoring of Habitats and species will help to mitigate / lessen / prevent any impact of our beach management works on the natural environment and its interest features. This includes:

3.3.3.1 Habitat Surveys

To provide a baseline, a vegetated shingle survey was undertaken in 2016 to establish the extent of the habitat types; Perennial Vegetation of Stony Banks and Annual Vegetation of Drift Lines. This survey covered the entire frontage and recorded distinct compartments with species level information. **Figure 3.2** illustrates a high level summary of the location of vegetated shingle and drift line habitats, summarising the 2016 survey. It also highlights the environmental restrictions that are to be applied to our works.

This baseline survey will be used to plan and demarcate haul routes pre-commencement. An annual re-survey will be undertaken in July / August, (as recommended by Natural England) to detect any changes in extent and in particular the current front edge of vegetation. Comparison between the baseline and current extent will enable the effect of the works to be monitored. In addition the current extent of Annual Vegetation of Drift Lines will be used to calculate the extent of accreted shingle that can be recycled from Gunner Point, without harm to this habitat. Each year we will present this data to Natural England to confirm the amount of shingle we can extract from more sensitive areas (I.e. Gunner Point). Vegetated shingle / annual vegetation of drift line habitats has benefited from our historic and proposed BMP activities, through the maintenance of stable shingle habitat for colonisation.

3.3.3.2 Bird Surveys

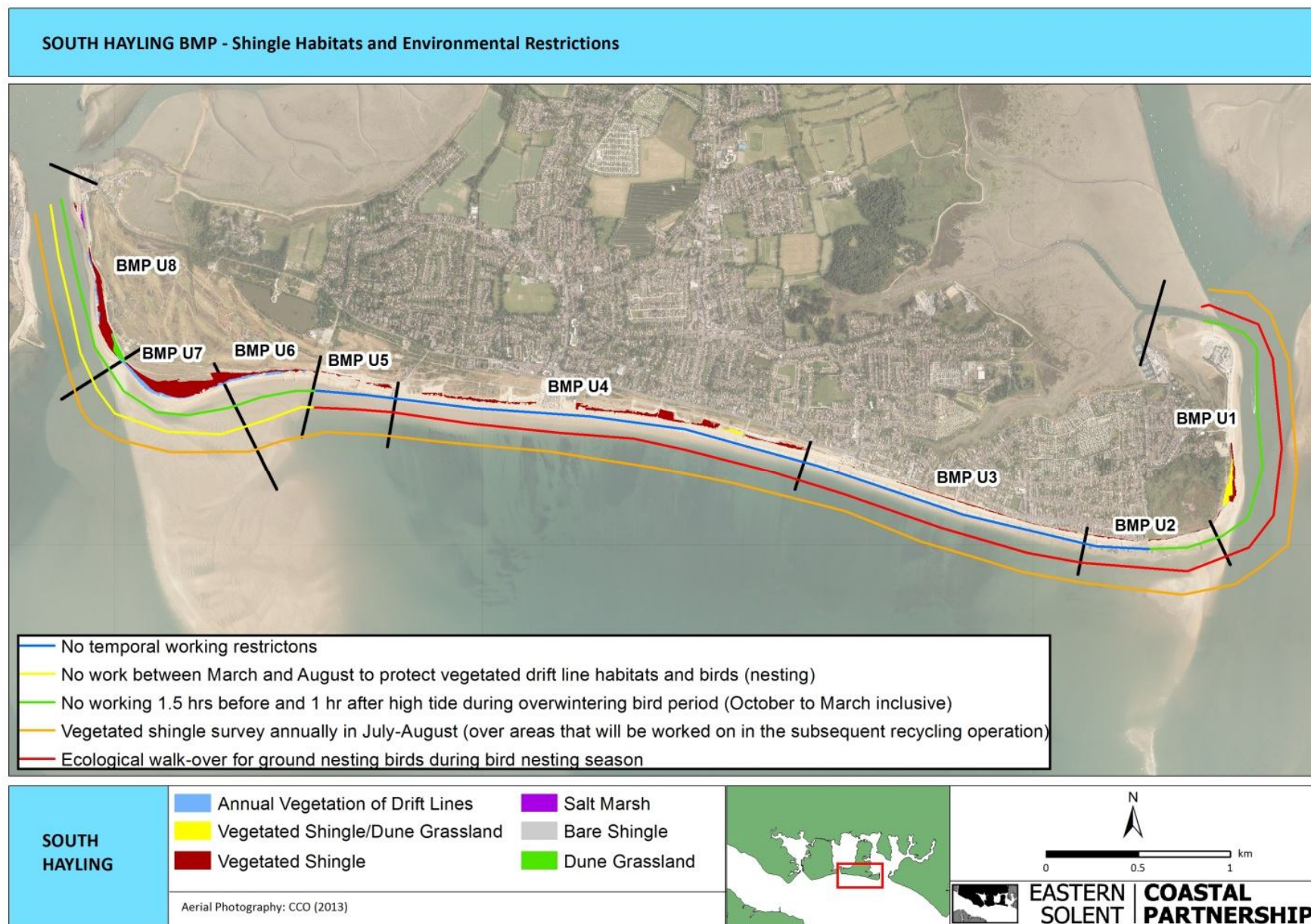
The bird interest on the Hayling Island beach frontage is of three main types of usage, overwintering and passage waders (mainly consisting of Sanderling, Ringed Plover and Dunlin), which utilise the beach for roosting and feeding; small numbers of breeding and ground nesting birds (Ringed Plovers), which can attempt to nest on the shingle beach; and foraging terns out on the wider Solent (including little, common and Sandwich Terns). Current survey data and anecdotal evidence would indicate that only low numbers of over-wintering waders feed on the frontage, but roosting behaviour can be significant in the Eastoke area with often 3-400 birds present. It is however believed that the roosting behaviour tends to be early season with little significant roosting occurring beyond November, this anecdotal information will be confirmed (or otherwise) via the ongoing monitoring proposed. Bird monitoring will take three main forms:

- Over-wintering bird surveys: will be undertaken from September to March annually, covering the Gunner Point area (Ferry Point to Inn on the Beach) and Eastoke (Black Point to Eastoke Corner), with two counts undertaken per month (one each for low and high tide). The purpose of the surveys is to understand the significance and seasonality of the use by bird populations.
- Watching briefs: have been undertaken and will continue to be undertaken periodically during 'rainbowing' and road import operations. Currently evidence would indicate that these operations generate minimal levels of disturbance to roosting birds, with minimal displacement only when birds are roosting within the groyne bay being worked on (see **Appendix A**). During each annual campaign a minimum of one watching brief for each type of operation will be undertaken. The observation will build up our knowledge of the operations effects on bird

populations and enable future operations to be adjusted if required to further minimise impacts.

- Pre-commencement walkover surveys for ground nesting birds: Any operations during the bird nesting season (March-August inclusive) will be preceded by a pre-commencement walk-over survey by a suitably qualified ecologist to identify any active nesting attempts by ground nesting birds (principally Ringed Plover) on the shingle beach. Depending on the location a decision will be reached on whether to a) demarcate an appropriate buffer zone around the nest, b) alter work plans, including haul routes and working areas to avoid nesting area c) delay works until the nesting attempt has naturally completed.

Figure 3.2: High level summary of the location of vegetated shingle and drift line habitats.



4. BACKGROUND INFORMATION REGARDING RELEVANT EUROPEAN SITES

4.1 European Sites

The proposed (and continuing Beach Management Activities on the South Coast of Hayling Island) are located both within and adjacent to the boundaries of the, Chichester and Langstone Harbours SPA and Ramsar site, the Solent Maritime SAC and the proposed Solent and Dorset Coast pSPA (see **Figure 4.1**). Details of the designated sites and their reasons for designation are outlined in the following section.

4.2 Chichester and Langstone Harbours - SPA and Ramsar

The large, sheltered estuarine basins of Chichester and Langstone Harbours comprise extensive sand and mud-flats which are exposed at low tide. The harbour basin contains a wide range of coastal habitats supporting important plant and animal communities. The invertebrate-rich mud-flats support extensive beds of algae (especially *Enteromorpha* species) and eelgrasses. The Chichester and Langstone Harbours site is of particular significance for water birds, especially in migration periods and in winter (JNCC, 2001b). It also supports important colonies of breeding terns *Sterna spp.*

4.2.1 Chichester and Langstone Harbours SPA

Chichester Harbour and Langstone Harbour are of European importance and are designated as an SPA, based on the criteria set out in **Table 4.1**. Its total area is 5810.03ha (Species that are known to utilise the area of interest are highlighted in bold in the following tables).

Table 4.1 Chichester and Langstone Harbours SPA site qualification information

Site qualification criteria	Qualifying details
This site qualifies under Article 4.1 of the Birds Directive by supporting populations of European importance of species listed on Annex I of the Directive	During the breeding season the area regularly supports
	Little tern, <i>Sterna albifrons</i> - 100 pairs representing up to 4.2% of the GB breeding population (5 year mean, 1992-1996).
	Common tern, <i>Sterna hirundo</i> - 33 pairs representing up to 0.3% of the GB breeding population (5 year mean, 1992-1996).
	Sandwich tern, <i>Sterna sandvicensis</i> - 31 pairs representing up to 0.2% of the GB breeding population (5 year mean, 1993-1997).
	Over Winter the area regularly supports
	Bar-tailed godwit, <i>Limosa lapponica</i> – 1,692 individuals representing up to 3.2% of the GB breeding population (5 year peak mean, 1991/92-1995/96).
This site also qualifies under Article 4.2 of the Directive (79/409/EEC). Over winter the area regularly supports:	Northern pintail, <i>Anas acuta</i> – 330 individuals representing 1.2% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Northern shoveler, <i>Anas clypeata</i> – 100 individuals representing 1.% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Eurasian teal, <i>Anas crecca</i> – 1,824 individuals representing 0.5% of the

Site qualification criteria	Qualifying details
	North-western Europe population (5 year peak mean 1991/92 – 1995/96).
	Eurasian wigeon, <i>Anas penelope</i> – 2,055 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Ruddy Turnstone, <i>Arenaria interpres</i> – 430 individuals representing 0.7% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Dark-bellied Brent Goose, <i>Branta bernicla bernicla</i> – 17,119 individuals representing 5.7% of the Western Siberia/Western Europe population (5 year peak mean 1991/92 – 1995/96).
	Sanderling, <i>Calidris alba</i> – 236 individuals representing 0.2% of the Eastern Atlantic/Western & Southern Africa - wintering population (5 year peak mean 1991/92 – 1995/96).
	Dunlin, <i>Calidris alpina alpina</i> – 44,294 individuals representing 3.2% of the Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/92 – 1995/96).
	Common Ringed Plover, <i>Charadrius hiaticula</i> – 846 individuals representing 3% of the GB population (5 year peak mean 1991/92 – 1995/96).
	Red-breasted merganser, <i>Mergus serrator</i> – 297 individuals representing 3% of the GB population (5 year peak

Site qualification criteria	Qualifying details
	mean 1991/92 – 1995/96). Eurasian Curlew, <i>Numenius arquata</i> – 1,861 individuals representing 1.6% of the GB population (5 year peak mean 1991/92 – 1995/96). Grey Plover, <i>Pluvialis squatarola</i> – 3,825 individuals representing 2.3% of the Eastern Atlantic - wintering population (5 year peak mean 1991/92 – 1995/96). Common Shelduck, <i>Tadorna tadorna</i> – 2,410 individuals representing 3.3% of the GB population (5 year peak mean 1991/92 – 1995/96). Common Redshank, <i>Tringa totanus</i> – 1,788 individuals representing 3.% of the GB population (5 year peak mean 1991/92 – 1995/96).
The area qualifies under Article 4.2 of the Birds Directive by regularly supporting at least 20,000 waterfowl.	Over winter, the area regularly supports 93,230 individual waterfowl (5 year peak mean 01/04/1998) including: Wigeon <i>Anas penelope</i>, Bar-tailed Godwit <i>Limosa lapponica</i>, Dark-bellied Brent Goose <i>Branta bernicla bernicla</i>, Common Ringed Plover <i>charadrius hiaticula</i>, Grey Plover <i>Pluvialis squatarola</i>, Dunlin <i>Calidris alpina alpina</i>, Redshank <i>Tringa tetanus</i>, Shelduck <i>Tadorna tadorna</i>, Curlew <i>Numenius arquata</i>, Teal <i>Anas crecca</i>, Pintail <i>Anas acuta</i>, Shoveler <i>Anas clypeata</i>, Red-breasted Merganser <i>Mergus serrator</i>, Ruddy turnstone <i>Arenaria interpres</i>, Sanderling <i>Calidris alba</i>.

4.2.2 Chichester and Langstone Harbours Ramsar

Chichester and Langstone Harbour are designated as a Ramsar site, under the international Ramsar Convention, based on the criteria set out in **Table 4.2**. (Species that are known to utilise the area of interest are highlighted in bold in the following tables)

Table 4.2 Chichester and Langstone Harbours Ramsar site qualification information

Ramsar Criterion	Qualifying details	
Ramsar criterion 1 - a representative, rare, or unique example of a natural or near-natural wetland type	Two large estuarine basins linked by the channel which divides Hayling Island from the main Hampshire coastline. The site includes intertidal mudflats, saltmarsh, sand and shingle spits and sand dunes.	
Ramsar criterion 5 – regularly supports 20,000 or more water birds	Assemblages of international importance:	
	Species with peak counts in winter: 76480 waterfowl (5 year peak mean 1998/99-2002/2003)	
Ramsar criterion 6 – species / populations occurring at levels of international importance	Qualifying species / populations occurring at levels of international importance	Number of individuals (5 yr. peak mean 1998/9-2002/3)
	Peak counts spring/autumn	
	Ringed plover, <i>Charadrius hiaticula</i>	853 individuals, representing an average of 1.1% of the population
	Black-tailed godwit, <i>Limosa limosa islandica</i>	906 individuals, representing an average of 2.5% of the population

Ramsar Criterion	Qualifying details	
	Common redshank, <i>Tringa totanus totanus</i>	2577 individuals, representing an average of 1% of the population
	Peak counts winter	
	Dark-bellied Brent goose, <i>Branta bernicla bernicla</i>	12987 individuals, representing an average of 6% of the population
	Common shelduck, <i>Tringa totanus totanus</i>	1468 individuals, representing an average of 1.8% of the GB population
	Grey plover, <i>Pluvialis squatarola</i>	3043 individuals, representing an average of 1.2% of the population
	Dunlin, <i>Calidris alpina alpina</i>	33436 individuals, representing an average of 2.5% of the population
	During the breeding season (species identified for possible future consideration under criterion 6)	
	Little tern, <i>Sterna albifrons albifrons</i>	130 apparently occupied nests, representing an average of 1.1% of the breeding population

4.3 Solent Maritime SAC

The Solent Maritime SAC is designated under the Habitats Directive, due to the presence of the habitats set out in **Table 4.3**.

Table 4.3 Annex I habitats that are a primary reason for the selection of this site as an SAC

Annex I habitats that are a primary reason for the selection of this site	Habitat details
Estuaries	The Solent and its inlets are unique in Britain and Europe for their hydrographic regime of four tides each day, and for the complexity of the marine and estuarine habitats present within the area.
Spartina sward <i>Spartinion maritimae</i>	Solent Maritime is the only site for smooth cord-grass <i>Spartina alterniflora</i> in the UK and is one of only two sites where significant amounts of small cord-grass <i>S. maritima</i> are found.
Atlantic salt meadow (<i>Glauco-Puccinellietalia maritimae</i>)	The Solent contains the second-largest aggregation of Atlantic salt meadows in south and south-west England, notable as being representative of the ungrazed type and supporting a range of communities dominated by sea-purslane <i>Atriplex portulacoides</i> , common sea-lavender <i>Limonium vulgare</i> and thrift <i>Armeria maritime</i> .

The Solent Maritime SAC also contains a number of qualifying features which, whilst valuable, are not primary reasons for the selection of this site as an SAC. These are indicated in **Table 4.4**.

Table 4.4 Annex I habitats and Annex II species present that are not a primary reason for the selection of this site as an SAC

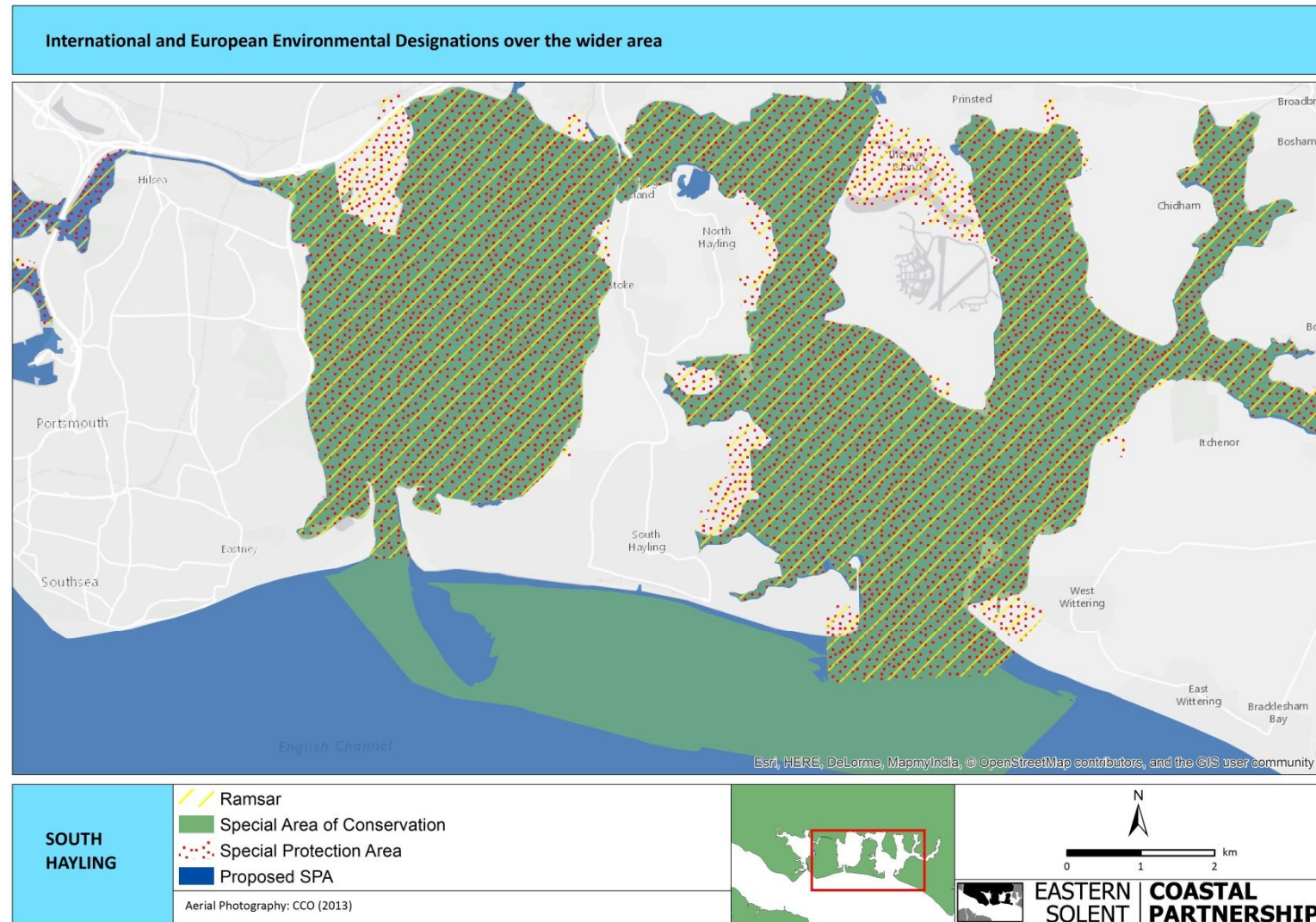
Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
Sandbanks which are slightly covered by sea water all the time
Salicornia and other annuals colonizing mud and sand
Mudflats and sandflats not covered by seawater at low tide
Coastal lagoons (a priority feature)
Annual vegetation of drift lines
Perennial vegetation of stony banks

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
"Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes")"
Annex II species present as a qualifying feature, but not a primary reason for site selection
Desmoulin's whorl snail <i>Vertigo moulinsiana</i>

4.4 Solent and Dorset Coast Proposed SPA [pSPA]

The Solent and Dorset Coast pSPA extends from Lulworth Cove at its western end through to West Sussex in the east. This boundary encompasses sea areas identified as being the most important feeding areas for tern colonies of existing SPAs (Sandwich tern, Common tern, Little Tern), adjoining Chichester and Langstone Harbour SPA and Ramsar, Portsmouth Harbour SPA and Ramsar and Solent Maritime SAC. The Solent and Dorset Coast pSPA was re-consulted upon between September 2016 and January 2017 at the time of writing this HRA; the pSPA has not been formally adopted. However we have considered impacts on the proposed SPA, as though it has been designated, as reflected in the mitigation table (Section 5).

Figure 4.1 International and European protected sites adjacent to Hayling Island



Page Intentionally Blank

5. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

5.1 Summary

This section assesses the impacts of the fully proposed Beach Management Plan (BMP) on the European sites and their interest features. It identifies mitigation measures and summarises whether there is any resultant Likely Significant Effect [LSE]. This will be used as supporting information for our Marine Licence and Planning Applications.

5.2 Summary of impact assessment process

Section 3 has summarised the proposed Beach Management activities and the proposed sources of shingle and **Section 4** has summarised the European sites and their interest features that could be impacted by this BMP.

This Section (**Table 5.1**) assesses any impacts that the scheme could have on the European site's interest features. Where impacts have been identified, mitigation has also been identified to reduce these impacts. Following the identification of mitigation measures, the assessment summarises any expected LSE and whether an Appropriate Assessment [AA] is required.

The proposed BMP (activity) is not directly connected with, or necessary for the management of the site for nature conservation, however failure to maintain the defences could result in loss of important terrestrial habitats landward of the existing defences.

5.3 Impacts, mitigation and LSE of the Hayling Island Beach Management Activities.

5.3.1 Impacts

Potential impacts of the Hayling Island Beach Management Activities on the European sites are recorded in **Table 5.1**, which confirms necessary mitigation and a summary of any LSE. The Monitoring and Mitigation plan has been developed in consultation with Natural England through their Discretionary Advice Service.

These measures have been developed to minimise any potential impacts, so that the works can take place in an environmentally acceptable way.

The major advantage of assessing these works is that they are basically a continuation of works that have taken place on a regular basis since 1985. The contractors and ESCP engineers are confident that with their experience of the works and also the additional scientific information we now have about the entire site, that our conclusions are appropriate and that there will be no likely significant effect from the works on the interest features of the designated site

Additional monitoring will help to build a better understanding of the environment along the frontage from which conditions and restrictions on works may be altered or lifted in future.

Table 5.1 Potential impacts, mitigation and likely significant effects of the proposed South Hayling Island Beach Management Plan to advise the Habitat Regulations Assessment.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
1.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from open beach recycling . Damage to vegetated shingle and drift line habitats through tracking machinery. Applies to the full Hayling Island Coastline (BMP Units 1 to 8).	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers). - Solent Maritime SAC, including vegetated shingle and drift line habitats.	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid damage and disturbance to breeding and ground nesting birds: ecological walkover immediately prior to works in nesting season only BMP units 1 to 5 (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 metre buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. No works to take place in BMP units 6 to 8 between March and August inclusive, as a known nesting site. To avoid disturbance to roosting birds: Undertake activity outside of overwintering bird period where possible. If recycling undertaken between October and March inclusive, stop works 1.5 hours before and 1 hour after high tide along Eastoke and Gunner Point frontages only (BMP Units 1, 2, 6, 7 and 8). Extraction and stockpiling may still occur during high tide, outside of the sensitive bird areas. This tidal restriction will not apply between April and September inclusive, noting that BMP units 6 to 8 will not be worked on at all between March and August. To avoid impacts on vegetated shingle / drift line habitats: Undertake vegetation surveys in late July / August to guide works. Plan haulage routes to avoid vegetated areas. Measures will be deployed to prevent impacts to vegetated shingle communities, which will be recorded in a CEMP. The CEMP will also set out the best practice techniques to ensure no pollution is caused. To avoid disturbance to breeding terns: Terns feed offshore at all states of the tide (April to September inclusive), however they breed over 4km away within Chichester and Langstone Harbours. It is not considered that the open beach recycling activities will impact terns in any way, especially as works will rarely take place in the summer months when they	No LSE expected due to the mitigation measures proposed. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA through a DAS agreement. Initial bird surveys have indicated that there is low bird usage in the area along the main open beach (BMP Units 3 – 5). The wider harbours are the preferred feeding and roosting areas due to their sheltered nature. Ongoing bird surveys will be undertaken to ensure a complete understanding of the use of this area by birds, which may lead to refinement of the tidal restrictions at Eastoke and Gunner Point (BMP Units 1, 2, 6, 7 and 8).	No.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
			are foraging within the wider Solent. Recycling activities are unlikely to cause increases in suspended sediments, and will therefore not impact foraging behaviour. This is because materials are course, and activities take place on the beach, not directly within the waterbody itself.		
2.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from rainbowing marine dredged shingle ashore at Eastoke via Barge (BMP unit 3 only) .	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers).	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid damage and disturbance to breeding and ground nesting birds: ecological walkover immediately prior to works in nesting season (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 metre buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime. To avoid disturbance to roosting birds: Rainbowing can only be undertaken at high tide guided by ship availability. Employ watching brief if activity occurs between October and March inclusive (matching existing planning conditions / work pattern at this location). Stop works if significant impacts are observed in consultation with Natural England. Works to be stopped during extreme weather events (frozen ground conditions for more than 1 week). The curtailing the work will prevent any significant effect on the SPA birds which will be under additional feeding pressure from said environmental conditions. Due to the nature of the works, they will only impact one to two groyne bays for two to four hours during each high tide period, therefore the rest of the South Hayling Island Open coastline remains disturbance free. To avoid disturbance to breeding terns: Terns feed offshore at all states of the tide (April to September inclusive), however they breed over 4km away within Chichester and Langstone Harbours. It is not considered that rainbowing activities will impact terns in any way, especially as works will rarely take place in the summer months when they are foraging within the wider Solent. Rainbowing activities are unlikely to cause increases in suspended sediments,	No LSE expected due to the mitigation proposed. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA through a DAS agreement. To give confidence to this conclusion, initial studies and advice from local experts has indicated that where rainbowing has historically taken place at Eastoke, roosting waders (principally Sanderling) appear to be largely unaffected by this very localised and short term operation. Large numbers of gulls / terns are attracted to the benthos of the supplied sediment as a source of food. Watching briefs will continue during future rainbowing campaigns, to fully confirm bird behaviour in relation to this activity. Appendix A details observations from historic watching briefs of rainbowing shingle ashore at this location.	No.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
			and will therefore not impact foraging behaviour. This is because materials are course, and material is pumped up onto the beach, not directly within the waterbody itself. As the works only take place within one or two groyne bays at any one time, the potential for impacts is further reduced. Note: Marine sourced materials will only be sourced from licensed dredge sites / permitted navigational activities that would provide this beneficial material for reuse. This HRA relates to placement only.		
3.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from extraction of shingle from Gunner Point (BMP Units 6 and 7). Damage to vegetated shingle and drift line habitats / interruption to natural coastal processes.	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers). - Solent Maritime SAC, including vegetated shingle and drift line habitats.	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid damage and disturbance to breeding and ground nesting birds, including terns: No extraction of shingle from Gunner Point during the bird breeding season (March to August inclusive). To avoid disturbance to roosting birds, including terns: Works will only take place here between September and mid March to avoid wider impacts. September is the preferable month for extraction to avoid the overwintering bird period. If extraction takes place between Oct and mid March inclusive, work will stop for 1.5 hours before, and 1 hour after high tide. No works will take place during extreme cold periods (frozen ground conditions for more than 1 week). To avoid impacts on vegetated shingle / drift line habitats: Undertake vegetation surveys in late July / August to guide works. Plan haulage routes to avoid vegetated shingle areas. Measures will be deployed to prevent impacts to vegetated shingle communities, which will be recorded in a CEMP. The CEMP will also set out the best practice techniques to ensure no pollution is caused. A drift line habitat / vegetated shingle survey was undertaken in 2016 (see Figure 3.2, which illustrates the location of these). From 2017, extraction of beach material will be seaward of the drift line habitat boundary. Volumes of material to be extracted from Gunner Point will be agreed with Natural England and the landowner prior to each	No LSE expected due to the strict mitigation measures proposed, and the ongoing liaison with Natural England proposed. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA through a DAS agreement.	No.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
			campaign, advised by vegetation surveys and details of accretion. To avoid impacts on natural coastal processes: There will be on-going detailed monitoring of beach levels to guide operations. We are working with natural coastal processes for the benefit of this frontage. Recycling from this point will maintain a flow of material to Gunner Point. This is a benefit, as lack of recycling and beach management would eventually lead to erosion at Gunner Point, and loss of vegetated shingle / drift line habitats.		
4.	Impacts of recycling and recharge activities on Water Quality i.e. increased suspended solids in the waterbody. Potential impact on foraging visibility for terns.	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers).	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid impacts on the water quality: BMP works have been taking place for a number of years and suspended sediments have never increased enough to cause impacts on protected species and habitats. Background levels on this exposed stretch of coast in storm conditions are expected to be relatively high so ecology of the area is well adapted to fluctuating levels of disturbance in suspended solids. The sediment being recycled and recharged on the open coast is large and therefore the material settles out quickly in the water body. The works are extremely localised and do not take place within the waterbody itself. Also, as they occur along the open coastline, the dilution factor is major, with any suspended sediments rapidly dispersed. Works are generally undertaken outside of tern breeding season, and are over 4km away from the nearest breeding colonies within the harbours.	No LSE expected due to the mitigation measures proposed.	No.
5.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from extraction of sand from around the Hayling Island Sailing Club slipway (BMP Unit 1) . Damage to vegetated shingle and drift line habitats and impacts on intertidal / subtidal sandflats.	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid damage and disturbance to breeding and ground nesting birds, including terns: ecological walkover immediately prior to works in nesting season (March to August inclusive). Provide exclusion area if nesting birds discovered (minimum of 5 metre buffer distance). Additional surveys will be carried out if required to ensure that birds have not nested in the meantime.	No LSE expected due to the strict mitigation measures proposed, and the ongoing liaison with Natural England proposed. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA through a DAS agreement.	No.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
		(with Turnstones and Oystercatchers in very low numbers). • Solent Maritime SAC, including vegetated shingle, drift line habitats and sandflats.	To avoid disturbance to roosting birds, including terns: Undertake activity outside of overwintering bird period where possible. If recycling undertaken between October and March inclusive, stop works 1.5 hours before and 1 hour after high. This tidal restriction will not apply between April and September. Works to be stopped during extreme weather events (frozen ground conditions for more than 1 week). The curtailing the work will prevent any significant effect on the SPA birds which will be under additional feeding pressure from said environmental conditions. To avoid impacts on vegetated shingle habitats: Undertake vegetation surveys in late July / August to guide works. Plan haulage routes to avoid vegetated shingle areas. Measures will be deployed to prevent impacts to vegetated shingle communities, which will be recorded in a CEMP. The CEMP will also set out the best practice techniques to ensure no pollution is caused. A drift line habitat / vegetated shingle survey was undertaken in 2016 (see Figure 3.2, which illustrates the location of these). During the 2016 survey, no drift line habitats were present. Locations and volumes of sand to be extracted in the vicinity of the Hayling Island slipway will be agreed with Natural England prior to each campaign, advised by vegetation surveys and details of accretion. To avoid impacts on intertidal / subtidal sandflats: Any sand to be extracted in this area is intertidal sand and will remain as intertidal sand. Material will only be removed in order to keep the Hayling Island Sailing Club slipway usable. Any material removed will be placed back into the same intertidal sediment system at Eastoke, so the material will find its way back. These minimal extractions will not cut off any sediment supply to Black Point. Therefore there is no loss of intertidal sandflat, just some minor working of it. There will be no change in subtidal habitat, as material will not be removed from the subtidal area. As discussed above, each campaign will first be agreed with Natural England to ensure		

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
			no LSE on this feature. To avoid impacts on natural coastal processes: There will be on-going detailed monitoring of beach levels to guide operations. We are working with natural coastal processes.		
6.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from gentle beach reprofiling at Langstone Harbour entrance (BMP unit 8) . Damage to vegetated shingle and drift line habitats through tracking machinery.	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers). - Solent Maritime SAC, including vegetated shingle and drift line habitats.	Refer to Figure 3.2, which spatially illustrates the timing restrictions and BMP units discussed below. To avoid damage and disturbance to breeding and ground nesting birds: No works to be undertaken along this frontage during the bird nesting season (March to August inclusive). To avoid disturbance to roosting birds: Undertake activity outside of overwintering bird period where possible. If recycling undertaken between October and March inclusive, stop works 1.5 hours before and 1 hour after high tide. This tidal restriction will not apply in September. Works to be stopped during extreme weather events (frozen ground conditions for more than 1 week). The curtailing the work will prevent any significant effect on the SPA birds which will be under additional feeding pressure from said environmental conditions. To avoid impacts on vegetated shingle / drift line habitats: Undertake vegetation surveys in late July / August to guide works. Plan haulage routes to avoid vegetated areas. Measures will be deployed to prevent impacts to vegetated shingle communities, which will be recorded in a CEMP. A drift line habitat / vegetated shingle survey was undertaken in 2016 (Figure 3.2, which illustrates the location of these). No works along this frontage between March and August to protect drift line habitat development. To avoid impacts on natural coastal processes: Only very minor reprofiling works are being promoted here to avoid localised erosion of the car park and impacts on the navigation channel. We are not proposing to move any material away from this frontage. As the annual activity will vary, we will submit a CEMP in advance of each operation.	No LSE expected due to the strict mitigation measures proposed, and ongoing liaison with Natural England proposed. The appropriateness of the mitigation has been agreed with Natural England during preparation of this HRA through a DAS agreement.	No.
7	Benefits of BMP activities on the wider	Chichester and Langstone	Beach management and working with natural	It is believed that delivery of the	No.

No	Potential Impacts of Scheme on European Sites (See Figure 3.2 for location of BMP units).	European Sites/Interest Features impacted	Mitigation / avoidance measures	Likely Significant effects [LSE] after mitigation	Requirement for further Appropriate Assessment / Imperative Reasons of Overriding Public Interest [AA/ IROP]
	South Hayling Island open coastline.	Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers). - Solent Maritime SAC, including vegetated shingle and drift line habitats.	coastal processes is widely considered as a better FCERM alternative to the construction of hard structures to protect against flooding and erosion, where there is the ability to sustainably do so. The process of recycling and recharging beaches in line with a nationally approved BMP ensures that there are no areas within the sediment cell that will be starved of sediment, which is a major benefit for the full South Hayling Island open coastline. Utilising material accreting on the beach will reduce the need for importing additional sediment from outside the sediment cell, which is our preferred beach management option, both environmentally and financially. However there will at times be a need to renourish the beach with materials imported into the system that match the resident shingle. This maintains healthy and stable beaches, allowing the establishment of vegetated shingle communities and active drift lines of vegetation. (Such as the communities that have been building up at Gunner Point as a result of our historic BMP works). This also maintains the areas of beach utilised by roosting birds	BMP, in line with the mitigation highlighted above, will have likely significant environmental benefits to the South Hayling Island coastline.	
8	In-combination impacts from other activities within / adjacent to the European designated sites.	- Chichester and Langstone Harbour SPA and Ramsar; Solent and Dorset Coast pSPA with their associated interest features, listed in Section 4. - Sanderling, Ringed Plover, Dunlin, Common, Little and Sandwich Terns (with Turnstones and Oystercatchers in very low numbers). - Solent Maritime SAC, including vegetated shingle and drift line habitats.	As discussed in the HRA (Section 5), other potential activities that could impact the European sites have been identified. If there is the potential that an 'in-combination' effect could arise, programming of works would require reconsideration, until the activity that causes the in-combination' effect has ceased. Due to the extensive mitigation built into the delivery of this BMP, as set out within this table, we are avoiding the likelihood of 'in-combination' impacts.	As explained in Section 5 , many potential in-combination impacts are prevented by programming of works and avoiding sensitive times for key interest features of the European sites. In addition, by adopting appropriate mitigation, it ensures that any unforeseen in-combination impacts are quickly identified and can be actioned. Therefore, with the control measures in place no LSE is expected.	No, as no LSE expected due to mitigation / avoidance measures adopted.

5.4 In-Combination / Cumulative Impacts Assessment

5.4.1 Introduction

The Environmental Statement prepared in support of the applications for consent for the proposed scheme includes a Cumulative Impact Assessment [CIA] (**Please see Chapter 20 of the Environmental Statement**). That is, the assessment of the potential effects of the works when combined with the potential effects of other relevant plans and projects in the study area (i.e. the area of influence of the works or the area in which receptors potentially affected by the works are present).

In line with agreed practice, this assessment will be limited to plans and projects where there is sufficient information to allow consideration of the potential for a cumulative or in-combination effect to arise. In the absence of publicly available information (usually in the form of a planning application) or a defined 'scheme', it is not possible to undertake a proper consideration of cumulative effects (i.e. if proposals are speculative or where assumptions regarding potential impacts may be contentious).

5.4.2 Projects Identified

There are a number of projects which have been identified to date as having the potential to have an environmental impact in-combination or cumulatively with the proposed scheme. These projects are outlined in **Table 5.2**.

Table 5.2 Plans and Projects considered in the CIA

Projects to be considered for cumulative impacts
From the Local Planning Authority / Local Plan:
• Housing Allocations in the Havant Borough Council Local Plan area. The closest allocation with the potential for future development is site ref / policy no HY45 Beachlands for 50 to 125 dwellings of low to high density.
• North Portsea Island Flood and Coastal Erosion Risk Management (FCERM) Scheme. • Southsea FCERM Scheme.
From MMO Licences:
• Chichester Harbour Dredging Protocol, including: - o Sparks Marina and Approach Channel maintenance dredging (L/2014/00144/3 and MLA/2014/000004/4). End date April 2024. - o Southsea outer Holding Pontoon Dredge (MLA/2012/ 00497). - o Treloar Hole Beneficial Dredge placement (MLA/2013/00485/2 and

Projects to be considered for cumulative impacts

34997/101125/2).

- West Wittering Estates PLC Management of excessive sand build up on the shoreline of West Wittering (MLA/2016/000407) / Adaptive Management at East Head (West Wittering).
- Archaeological Investigations: warship hazardous prize project group ship wreck (MLA/2014/004761).

5.4.3 Cumulative Impacts Assessment Investigations

European Commission (1999) and IEMA (2004) standard guidance will be used for the CIA, with the first step being to determine the likely spatial and temporal overlaps of the plans and projects screened into the assessment in order to determine where interactions could arise; the next being to determine the effects of the proposed scheme that have the potential to affect receptors in-combination with other proposed activities; and the final step being to determine the significance of any potential interactions/effects identified (as well as relevant mitigation). The CIA will be carried out throughout the EIA process, and full consideration of 'In-combination' impacts will be made as each phase is taken for planning approval.

5.4.4 Assessment of 'In-combination' Impacts

Table 5.3 summarises the key impacts identified in **Table 5.1** and explains how other schemes, developments and proposals could result in an in-combination effect. It also sets out what the mitigation which will be fully considered as part of the EIA process.

Table 5.3: How the scheme impacts identified in Table 5.1 could be influenced by 'in-combination' effects of other proposals within or adjacent to the European sites

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
1.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from open beach recycling .	No, none of the plans and projects identified interfere with the beach materials, and will therefore not impact nesting birds / vegetated shingle. However, the housing allocations at Broadmarsh could	The scheme cannot mitigate for potential impacts from new housing developments. The Solent Disturbance and Mitigation Project has been established, to mitigate impacts from development / increased disturbance	No.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
	Damage to vegetated shingle and drift line habitats through tracking machinery. Applies to the full Hayling Island Coastline (BMP Units 1 to 8).	result in more people using the beach, causing greater disturbance. It will be a requirement of this plan to ensure no additional impacts on the protected species and habitats present.		
2.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from rainbowing marine dredged shingle ashore at Eastoke via Barge (BMP unit 3 only) .	No, none of the plans and projects identified interfere with the beach materials, and will therefore not impact nesting birds / vegetated shingle. Other FCERM schemes, such as North Portsea Island and Southsea will have their own control measures to ensure no disturbance to protected species and habitats.	No, we have promoted a scheme that will not impact protected species through rigid controls on the timing of activities. This avoids the potential for in-combination impacts.	No.
3.	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from extraction of shingle from Gunner Point (BMP Units 6 and 7) . Damage to vegetated shingle and drift line habitats / interruption to natural coastal	No, none of the plans and projects identified interfere with Gunner Point directly, and will therefore not impact nesting birds / vegetated shingle. Other FCERM schemes, such as North Portsea Island and Southsea will have their own control measures to ensure no disturbance to protected species and habitats.	No, we have promoted a scheme that will not impact protected species through rigid controls on the timing of activities. This avoids the potential for in-combination impacts.	No.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
	processes.			
4.	Impacts of recycling and recharge activities on Water Quality i.e. increased suspended solids in the waterbody. Potential impact on foraging visibility for terns.	Whilst we are not expecting significant increases in suspended sediments during BMP activities, other dredging activities could cause an increase in suspended sediments. It is unlikely that this could cause any 'in-combination' impacts, however we will consider this potential impact when planning works.	No, but we will continually consider the potential for 'in-combination' impacts from future dredging proposals if they are in the vicinity.	No.
5	Damage and disturbance to breeding and ground nesting birds, and visual / auditory disturbance to roosting birds / terns from extraction of sand from around the Hayling Island Sailing Club slipway (BMP Unit 1) . Damage to vegetated shingle and drift line habitats and impacts on intertidal / subtidal sandflats.	No, none of the plans and projects identified interfere with the sandflats at this location, and will therefore not impact nesting birds / vegetated shingle. This area is well secluded from other activities, such as the North Portsea Island and Southsea schemes. Whilst West Wittering Estates are facing similar issues on the opposite side of Chichester Harbour (excessive sand in the system), they will not be undertaking any works that could interfere with our proposals.	No, as we have adopted rigid mitigation along this stretch of coastline to prevent any impacts on protected species, whether in-combination or alone.	No.
6	Damage and disturbance to breeding and	No, none of the plans and projects identified interfere with the beach	No, as we have adopted rigid mitigation along this stretch of	No.

Impact No.	Impact of scheme alone	Potential for 'in-combination' effect?	Additional mitigation / avoidance methods required?	'In-combination' LSE?
	ground nesting birds, and visual / auditory disturbance to roosting birds / terns from gentle beach reprofiling at Langstone Harbour entrance (BMP unit 8). Damage to vegetated shingle and drift line habitats through tracking machinery.	profile at this location, and will therefore not impact nesting birds / vegetated shingle. This area is well secluded from other activities, such as the North Portsea Island and Southsea schemes.	coastline to prevent any impacts on protected species, whether in-combination or alone.	

6. CONCLUSIONS

6.1 Is the proposal likely to have a significant effect 'alone and / or in-combination' on a European Site

Because of the extensive mitigation measures and ongoing monitoring programme that will be put in place during beach management activities, it is **not anticipated that there will be either a short term or long term Likely Significant Effect on the European sites as a result of the Hayling Island BMP works, either alone, or 'in-combination'**. We have worked closely with Natural England to identify appropriate mitigation, and we are therefore confident in this conclusion. Given the extensive work we have undertaken to identify appropriate mitigation, we expect any Conditions applied to assents, to be advised by Table 5.1. Also, given that each recycling campaign will differ, based on the mix of available sources of material / environmental constraints, we propose to issue a Construction and Environmental Management Plan in advance of each campaign, to confirm our approach and working methods, in line with the promoted mitigation.

We are expecting to see some environmental benefit to the European sites from the delivery of the South Hayling Island Beach Management Plan implementation, due to the maintenance of healthy shingle beaches and their associated habitats and functions.

Based on this assessment and resultant conclusions, we do not believe an additional scheme level Appropriate Assessment is required, and a Statement of case for IROPI is also not required. Therefore the project is deliverable to protect the people of Eastoke, property, infrastructure and the environment from flooding and erosion.

As set out, we have undertaken beach management activities historically along much of this frontage without having any Likely Significant Effect on the environment.

Appendix A: Watching Brief

Note of ecological watching brief for Eastoke Beach management

Observer: Ed Rowsell, ESCP

Baseline surveys and a watching brief were undertaken for the October/November 2015 beach replenishment operation on Hayling beach at Eastoke, to assess any impacts upon birds and in particular overwintering bird populations associated with the Chichester and Langstone Harbour Special Protection Area (SPA) – see figure 1. The area is known to support a regular roost of Sanderling and Ringed Plover and to a lesser extent Dunlin that can reach peaks of 3-400 birds. The high tide roost tends to occur from August, with peak numbers in August and September, it is particularly used at weekends potentially when the roost at Black Point (within Chichester Harbour) is more frequently disturbed, the roost is used less frequently in the winter months and is often not present by November.

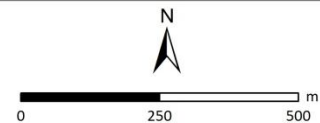
EASTOKE BEACH - GROYNE BAY LOCATIONS



**HAVANT
BOROUGH
COUNCIL**

 Surveyed Groyne Bays

Aerial Photography: CCO (2013)



**EASTERN
SOLENT**

**COASTAL
PARTNERSHIP**

Baseline surveys were undertaken immediately prior to the operation, both at night and daytime. Night time surveys were undertaken using high quality 7x42 binoculars and a 5x magnification night scope with an infra red illuminator.

Date	Type	Time	Time of high/low
28/10/2015	Night time	23:30-00:30	23:50 (high)
30/10/2015	Daytime (high))	13:00-14:00	13:00 (high)

Table 1 baseline data

Baseline night time High tide count						
Date	28/10/2015	Time	23:30-00:30			
Groynes						
14-17						
18-21	1 Ringed Plover heard not seen					
22-24	1 Ringed Plover heard not seen (could be same bird)					
25-28						
Comments: Wind F 5-6 south, air temp 14 C. No disturbance recorded in survey period.						

Baseline daytime high tide count						
Date	30/10/2015	Time	13:00-14:00			
Groynes						
14-17	1 Sanderling roosting, 1 Pied Wagtail					
18-21	1 Black-headed Gull roosting					
22-24	16 Ringed Plover, 1 Sanderling roosting, 1 Linnet					
25-28	1 Sanderling feeding					
Comments: Wind F3-4 East, air temp 16 C. Ringed Plover and Sanderling roost was high on plateau of beach, flushed by pedestrians at 13:40, returned to same location by 13:41.						

Beach replenishment operation watching brief

The replenishment operation is undertaken by a dredging vessel 'rainbowing' the material onto the beach at high tide, as a tidally dependant operation to gain the maximum benefit from the vessel both tides in a day were utilised. A watching brief was therefore undertaken during a night time and daytime operation, where possible two discharge operations were undertaken per tidal cycle, each discharge operation takes around 1 hour on shore. The deposition area for the replenishment was between groynes 17-19, adjacent to the Southwood Road beach Carpark.

Night time operation Friday 30/10/2016 on site 21:30- 02:30

The dredger was delayed and deposition planned to commence at 22:30 started at 01:30 and only a single discharge was undertaken, therefore a series of observations were undertaken before the operation commenced.

Baseline night time watching brief 30/10/2015	
Weather	Wind F2-3 west, Temp 15 C
Time	
21:45-22:30	
Groynes	
14-17	
18-21	
22-24	1 Sanderling feeding
25-28	
Comments: Anglers on edge of groyne 19	
Time	
22:45-23.30	
Groynes	
14-17	1 Sanderling roosting
18-21	2 Sanderling roosting
22-24	1 Ringed Plover Roosting
25-28	
Comments:	
Time	
00:15-01.00	
Groynes	
14-17	
18-21	2 Sanderling roosting (within deposition area
22-24	
25-28	
Comments:	Survey undertaken before activity on beach commenced.

Narrative of discharge operation: On the approach of the dredger at 01:30 one Sanderling flushed and flew west unsighted in response to the sweep of the vessels lights. The second Sanderling flushed when the vessel was around 100m from the beach. 2 Sanderling assumed to be the same birds were relocated at 01:35 within groynes 22-23. At 01:45 a further 2 Sanderling were located between groynes 14/15 to the east of the operation. Upon completion of the discharge operation at 02:30 2 Sanderling were still present roosting at groynes 22-23, but were absent from groynes 14/15.

Daytime operation Sunday 1/11/2015 on site 12:00-14:00

Baseline day time watching brief 1/11/2015	
Weather	Wind F 0 , Temp 14 C
Time	
12:30-13:00	
Groynes	

14-17	
18-21	50 Herring Gull, 20 Black-headed Gull
22-24	1 Herring Gull, 3 Black-headed Gull
25-28	20 Linnet
Comments: Lots of anglers , walkers and dog walkers	

Narrative of discharge operation: Gull species within the discharge area flew to vessel as it approached and flew around boat during operation, which commenced at 13:10. A Cormorant apparently attracted to the activity landed on the water and proceeded to dive/forage within 20m of the vessel throughout the operation. At 13:30 a flock of 25 Sanderling approached from the east, flew passed the operation a few time before departing to the west, there destination was unsighted and outside of the immediate study area e.g. between groynes 14-28. The observer left the site at 14:00 when the vessel finished its first discharge operation.

ESCP staff supervising the operation returned to the deposition area at 16:00 and located approximately 50 Sanderling feeding within the discharge area, the second discharge operation commenced at 14:25, upon which the birds were displaced, unfortunately it was not recorded where the birds moved to.

Discussion

From previous observations by the author and local birders, the peak usage of Eastoke beach frontage as a wader roost is August and September, the beach is heavily used for recreational purposes in the day and the wader roost is regularly disturbed and will often move just a short distance and recommence roosting. Later in the year e.g. October and November the use is more sporadic and often consists of a few birds feeding or roosting singly. The baseline surveys identified small numbers of waders using the beach during the day and at night, which reflects the previous observations.

The night time discharge operation would appear to indicate that there are few birds roosting in the area at night at this time of year, it is also noted that waders were displaced only approximately 100m from the operation and a further two waders approached into within 100m of the operation.

The day time discharge, potentially due to high disturbance and the limited number of waders using the frontage at this time of year, there were no waders in a position to be displaced. It does however indicate that the operation actually acts as an attractant to seabirds such as gulls and cormorant. Which is predicable, the dredged material contains the benthos from the dredge area and the birds are feeding on this material and these species groups are well known for this type of behaviour. What was less expected was that the Sanderling would also make use of the this resource, and it is clear that the displacement effect of the operation is very short-lived with birds returning to feed between the discharge operations, returning less than 2 hours after the previous discharge.

It is concluded that the operation has at worst a minor displacement effect on feeding and foraging waders using the beach frontage and certainly would not constitute a significant effect on bird

populations. In this location with the known pattern of bird usage winter operations may actually have less potential for impacts than the traditionally accepted August-September working window.